NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

ECONOMICPROGRAM

GROWTH EFFECT OF FOREIGN DIRECT INVESTMENT IN THE MONGOLIA

TSETSEGSAIKHAN BATSUKH

MASTER'S THESIS

NICOSIA
2018

NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
ECONOMICPROGRAM

GROWTH EFFECT OF FOREIGN DIRECT INVESTMENT IN THE MONGOLIA

TSETSEGSAIKHAN BATSUKH

MASTER'S THESIS

THESIS SUPERVISOR

Asst. Prof. Dr. BehiyeCavusoglu

NICOSIA
2018

ACCEPTANCE/APPROVAL

We as the jury members certify the "Thesis Title" prepared by the Tsetsegsaikhan Batsukh defended on

22/06/2018

Has been found satisfactory for the award of degree of

Master

JURY MEMBERS

Asst.Prof.Dr. Behiye Cavisoglu (Supervisor)
Near East University/Department of Economics

Assoc. Prof. Dr. Huseyin Ozdeser(Head of Jury)
Near East University/Department of Economics

Asst. Prof. Dr. Nil Gunsel Resatoglu
Near East University/Department of Banking and Finance

Prof. Dr. Mustafa Sagsan
Graduate School of Social Sciences
Director

DECLARATION

I,Tsetsegsaikhan Batsukh, hereby declare that this dissertation entitled 'Growth effect of Foreign Dırect Investment in the Mongolıa' has been prepared myself under the guidance and supervison of "Asst. Prof. Dr. Behiye Cavusoglu" in partial fulfilment of The Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach any Law of Copyrights and has been tested for plagarism and a copy of the result can be found in the Thesis.

☐ The full extent of my Thesis can be accesible from anywhere.

☐ My Thesis can only be accesible from the Near East University.

☐ My Thesis cannot be accesible for (2) two years.If I do not apply for extention at the end of this period, the full extent of my Thesis will be accesible from anywhere.

Date

Signature

Name, Surname

DEDICATION

To my beloved son and daugther

ACKNOWLEDGEMENTS

ABSTRACT

GROWTH EFFECT OF FOREIGN DIRECT INVESTMENT IN THE MONGOLIA

Nowadays, considering the relationship between economic growth and Foreign Direct Investment (FDI) inflows has become the widespread topic for voluminous empirical research explaining the difference among economic attainment of countries. Concerning the point of view, this thesis has made an effort to find a consequence in case of the Mongolia using Vector Error Correction Model (VECM) technique and Granger Causality test employing data for the period 1990-2016. Therefore, it is significant that first time, the study attempts to bring out the growth impact of FDI in different sectors of the Mongolia's economy. As same as the most of other empirical studies, VECM estimates havebeen found the positive and statistically significant long- and short term effect of FDI on the overall economy. Moreover, the relatioship dealing with the Granger cause of FDI in different sector to the growth rate of the economy has not been detected but there are theoretically acceptable findings that growth rate of GDP does Granger cause to FDI in primary and service sector and no causal relation among economic growth and FDI in manufacturing sector in the Mongolia.

Keywords:FDI, economic growth, Mongolia,econometric analysis, VECM Model, Granger Causality Test

ÖZ

DO RUDAN YABANCI YATIRIMLARIN MO OL STAN EKONOM S ÜZER NDEK BÜYÜME ETK S

Günümüzde, ekonomik büyüme ile do rudan yabancı yatırım giri leri arasındaki, ülkelerin ekonomik durumları arasındaki farkı açıklayan büyük ampirik ara tırmalar için yaygın bir konu haline gelmi tir. Bu noktadan yola çıkıldı ında, bu tez, Mo olistan'da En Küçük Kareler (EKK) tekni i ile 1990-2016 yılları verilri kullanılarak Granger nedensellik testi ile bir sonuç bulmak için çaba sarf etmi tir. Bu nedenle, bu çalı ma ilk kez, Do rudan Yabancı Yatırımların Mo olistan ekonomisinin farklı sektörlerindeki büyüme etkisini ortaya çıkarmaya çalı maktadır. Bu tezde, di er ampirik çalı maların ço u ile benzer sonuçlara varılmı ve Mo olistan'da Do rudan Yabancı Yatırımlar'ın genel ekonomi üzerinde pozitif ve istatistiki olarak anlamlı bir etkisi oldu u bulunmu tur ancak Granger nedensellik testi sonucunda iki de i ken arasında nedensel bir ili ki saptanmamı tır. Sonuçlar, farklı sektörlerdeki Do rudan Yabancı Yatırımları'nın giri lerinin (birincil, imalat ve hizmet sektörlerinin) farklı oldu unu ve bu bulgunun di er çalı malardan biraz uzak oldu unu gösteriyor. Ayrıca, hem birincil hem de hizmet sektörlerindeki Do rudan Yabancı Yatırımların ekonomik büyüme üzerinde olumlu ve önemli etkileri oldu u ortaya çıkmı fakat imalat sektöründeki Do rudan Yabancı Yatırımların Mo olistan'ın ekonomik büyümesi üzerinde bir etkisi olmadı ı saptanmı tır.

AnahtarKelimeler: Do rudanyabancıyatırımlar,Ekonomikbüyüme,Mo olistan, ekonometrikanaliz, VECM model, Granger NedensellikTesti

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

FDI	Foreign Direct Investment
LDCs	Less Developed Countries
MNCs	Multinational Corprations
OECD	Organization of Economic Cooperation and Development
TFP	Total Factor Productivity
R&D	Research and Development
GDP	Gross Domestic Product
FSU	Former Soviet Union
USSR	Union of Soviet Socialist Republic
OT	Oyu Tolgoi
TT	Tavan Tolgoi
NSOM	National Statistical Office of the Mongolia
WB	World Bank
UNIDO	United Nations Industrial Development Organization
CMEA	Council for Mutual Economic Assistance
GSP	Generalized System of Preferences
SME	Small and Medium Enterprises
SCO	Shanghai Cooperation Organisation
GoM	Government of the Mongolia
LPUC	Law on Prohibiting Unfair Competition
UCSRA	Unfair Competition Supervisory and Regulating Authority
EPA	Economic Partnership Agreement
FIPPA	Foreign Investment Promotion and Protection Agreement

NDA	National Development Agency
BFI	Board of Foreign Investment
FIFTA	Foreign Investment and Foreign Trade Agency
GAIPSR	General Authority for Intellectual Property and State Registration
MIGA	Multilateral Investment Guarantee Agency
WTO	World Trade Organization
FGLS	Feasible Generalized Least Squares
OLS	Ordinary Least Square
EPA	Economic Partnership Agreement
VECM	Vector Error Correction Model
ADF	Augmented Dickey Fuller

TABLE OF CONTENTS

INTRODUCTION

Rationale of the study

For economists how to reach economic growth is a salient problem suspecting the question that "why some countries are rich and others poor". In order to answer such a question, economists have been trying to examine long-run economic growth and its change in examples of one and cross-country case. Therefore, for policy makers this problem has been their obsession during hundreds of year.

After the great decolonization and also lately former Soviet Union collapsed, the race in which how less developed countries catch up advanced countries seems to be started. Bell (1989) emphasized the implication of a ''pioneers'' and ''latecomers'' as an organizing framework describing that newly independent countries started their development path in a world which the other countries already had become advanced (Lynge Nielsen, 2011). For less developed countries there are many factors which can positively affect on their economic growth in order to catching up such high development and among those factors foreign direct investment is deemed to be seen as distinctive one.

As Alfaro (2003) wrote, a phenomenon that Foireign Direct Investment (FDI) can convey great advantages to a host country seems to be natural. On one hand the assumption that ''FDI by multinational firms has positive effect on recipient country's economy by creating technological externalities, for instance, knowledge spillovers and increasing competition of local firms'' is quite obvious. On the other hand, attracting FDI has been taken one of core ways that gives advantages to those Less Developed Countries (LDCs) like the Mongolia by adopting new technologies that available in advanced countries. By adopting new technologies and ideas (accepting an economy penetrating technological attainment), LDCs may increase their technological level or productivity and in turn reach to economic growth.

Moreover, new technologies which are introduced in LDCs may positive spillovers from subsidiaries of multinational corporations to domestic firms (Findlay, 1978).

Nevertheless, deserving such positive aspect of FDI is not much easy and the process must be required some conditions. Some authors argue that consuming new technologies would require skilled workers from the host country's labour force since it is obvious that capital goods in high level need to be combined with labour that can work with the new technology. Therefore,Borensztein, et al., (1998) considered that technological spillover is possible when certain level or threshold of human capital is availabe in the host country. Other authors highlight that the effiecient way of absorbing the process of technological spillovers would be well-functioning markets which allows the process to work without any abnormality or bound. Under these circumstances, FDI by Multinational Corprations (MNCs, moreover, their affiliates) to host economy ensure competition and reduces market distortions, enhancing the exchange of knowledge among firms (Bhagwati, 1978; Ozawa, 1992; Balasubramanyam, et al., 1996). Some other researchers stress that the environment of institutional establishment (property rights, specifically, intellectual property rights) to be a crucial factor to attract high technology FDI (Smarzynska, 1999). The author argues that in a country built the intellectual property rights weakly, only low technology investment can be made and it reduces the potential opportunities for assimilating positive spillover effects of FDI and improvements of productivity of domestic firms. In essential, recipient countries of FDI should have potent environment for absorbing the advantages which can stimulate their economic growth.

Despites, a number of interesting studies of the role of FDI stimulating economic growth has been appeared, the connection between economic growth and FDI shapes one of the three causal relations, those are FDI-led growth, growth-induced FDI and bilateral relation between the two or no causal relationship among them. Studies highlighted on this matter show a significant relationship in all those three directions with utilizing some firm, sector and country specific variables. In this thesisrole of FDI to economic growth is explored and specifically, causal relation in different sectors namely primary, secondary and tertiary is taken by main question.

Aim of the study

The purpose of this study is to examine the impact of FDI on the economic growth theoretically and assess it in case of the Mongolia over the period of 1990-2016 using Error Correction Model (ECM) technique. This is the main contribution of the thesis that the work also make an effort for bringing out the relationship on different sectors of the economy that are primary, secondary and tertiary/services sectors. It can be said the first attempt to assess sectoral impact of FDI on economic growth in the case of the Mongolia. Furthermore this study is significant for upcoming studies which will be examined in this field later to acquire an elementary estimation in case of the country.

Hypothesis of the study

The initial question carried in this study is that ''Is economic growth affected by FDI and whether it is different by economic activities that FDI settled in?''. So that getting answer for this question, the study puts following presumptions:

First, Aggragate FDI has a positive impact on economy of the Mongolia

Second, FDI in primary sector does not Granger cause economic growth

Third, FDI in manufacturing sector Granger causeseconomic growth

Fourth, There would be a causal relation FDI in service sector to the economy.

Structure of the study

The paper is structured as follows: chapter two outlines theoretical and empirical review of literature in framework of growth-FDI nexus and it will be continued by the historical context for economic growth and foreign investment in case country of the Mongolia.Chapter four describes the sources of collected data, method and model applied to the analysis of relationship between economic growth and FDI. In next chapter assesses the growth impact of foreign investment inflow empiricallyduring the period which is considered transition from center planned economic system to market economy, 1990-2016, in particular, sectoral effect of FDI on growth rate will be accounted for and presents empirical results and interpretation. Chaptersix concludes and makes recommendation.

1. CHAPTER LITERATURE REVIEW

The debate over the merits of foreign direct investment (FDI) cannot be revealed until understanding how it influences on human welfare. Since economic growth is the issue for long – run human welfare, the study for revealing instinct of FDIshould bestarted the investigation of FDI's effects on economic growth. As Organization of Economic Cooperation and Development (OECD), 2002 determined ''Foreign direct investment (FDI) is an integral part of an open and effective international economic system and a major catalyst to development''. It is widely recognized that FDI produces economic benefits to the recipient countries by providing capital, foreign exchange, technology and by enhancing competition and access to foreign markets (Khondoker Abdul Mottaleb and Kaliappa Kalirajan, 2010).

More comprehensive implication of FDI provided by same organization as above, OECD (1997), as known as benchmark definition of FDI: FDI reflects the objective of obtaining a lasting interest by aresident entity in one economy (direct investor) in an entity resident settled in another economy that is not relevant to the investor (direct investment enterprise). From the definition, the lasting interest is the core to the derivative relation which implies the existence of a long – term connection among the direct investor and the invested – in enterprises and arises a degree of influence on the management of the enterprise. Moreover, FDI implies a unit investing in abroad out of its home country and purchases the power to take some degree of control over the decision making process in a unit which is invested in. This makes suspicion that something more than money and physical capital is involved in FDI. As Alfaro (2003) considered that this might simply be a source of valuable technology and know-how and furthermore it could be spread to domestic economy to fuel the economy of recipient country.

All in all, FDI can be accredited not only a source of "capital generating" (directly) but also a "technological generating" (indirectly) that reflects the superior knowledge of the investing country. In this section, theoretical and empirical literatures concerning effect of FDI on economic growth will be discussed.

1.1 Review of theorethical literature

"Economic theory is, in essence, a collection of models; simplified representation of reality, which inevitably leave out some aspects to focus on others. (Krugman, 1994)

For analyzing the theoretical impact of FDI on economic growth, several partial aspects such as capital accumulation and technology spillovers have been focused. From the basic knowledge, capital accumulation can be accounted as the monetary value of investment and the amount of income that is reinvested, or as the change in the value of assets owned. Addition to this idea, smarter and more productive organization of production can also increase its output without increased capital. In other word, output as an entire economy can be created without increased investment by inventions or improved organization and adopting better production manner that increase productivity which is unavailable in underdeveloped country but available to them by FDI. But, contribution of FDI to capital accumulation is quite obvious than analyzing technology.

There is a wide theoretical framework that promotes the existence of positive connection between FDI and economic growth. Most of those studies identify the technology transfer as the main way which FDI contributes to economic growth. As Marco Neuhaus (2006) explained, in the search for the origins of technological progress, the idea came up that the level of technology depends on two different factors. First, the technological level is determined by the quality of the factor inputs, capital and labor, and second, by the knowledge of combining the factors in the production process to reach maximum efficiency. The points paved the way for the development of the endogenous growth models in middle of the 1980s. The quality of labor became the focus of the endogenous growth models with human capital, the quality of capital was the object of the endogenous growth models of technological change through capital deepening and the overall efficiency of the technology was part of the endogenous growth models based on knowledge spillovers (Marco Neuhaus, 2006).

For bringing technology into account of models, theoretical literatures on relationship between economic growth and FDI can be drawn by two stages of neoclassical approach. One is ''exogenous growth model'' based on Solow growth accounting in which economic growth is primarily explained by the accumulation of physical capital and labour. The residual of the growth decomposition which is not involved in factor accumulation is attributed to "technological progress" (also commonly known as total factor productivity (TFP)). FDI has much role on these other unexplained factor, but the technological progress is not explained by the model in this approach. Other one is ''endogenous growth models'' assuming that any extra unit of capital investment brings about knowledge gains not only for the investing firms but also for the entire economy. This idea that investment–related knowledge spillovers generate positive long-run growth rates has intuitively become basic theoretical aspect from mid-1980s (Marco Neuhaus, 2006). One major idea in this aspect of literature is that the level of technology can be improved by purposeful activity, for instance, R&D expenditures. This potential for endogenious technological progress would allow an escape from dimishing returns at the aggregate level, especially if the improvements in technique can be shared in a non-rival manner by all producers. This nonrivalry is plausible for advances in knowledge, that is, for new ideas (Robert J. Barro; Xavier Sala-i-Martin, 1999).

In this thesis, theoretical interpretation of role of FDI on economic growth will be based on endogenous growth model, particularly, Charles I. Jones' model is taken for fundamental explanation of the nexus between economic growth and FDI based on knowledge diffusion.

1.1.1 Endogenous technological change: Charles I. Jones approach of economic growth

It was widely believed that FDI have permanent effects on economic growth, but until the mid-1980s, basically it was difficult to explain the permanent positive growth effect. Exogenously driven explanation of long – run productivity growth made dissatisfication to some growth theorists led by Paul Romer in the mid of 1980s (Robert J. Barro, Xavier Sala-i-Martin (1999). As a result, class of growth model which key determinants of model were endogenously explained had appeared and was named "endogenous growth approach" because of showing the determination of long-run growth within the models.

In 1990, Paul Romer has written a paper modeling how technological progress occurs. Main contribution of the model was absence of diminishing returns to capital which was inherent to early neoclassical models (for instance, Solow-Swan model). By the Romer's approach, new ideas are created by researchers which work in the Research and Development sector. The accumulation of those new ideas is known as the stock of knowledge and ideas and spreads over the economy. As a result, other production factors namely capital and labor become more productive. This explains how technology assimilates over time in the Romer's economy. As Charles, I. Jones (1995) considered, by 1990s, the endogenous growth literature has turned to a class of models in which growth is driven by technological change that results from the research and development (R&D) efforts of profit maximizing agents. For the expression of the model that explain economic growth mathematically, Charles I. Jones (1995) based on Romer/Grossman-Helpman/Aghion-Howitt models is consulted in this thesis.

Formally, as Charles I. Jones (1995) used in his work named "R&D-based models of economic growth", following standard production function:

$$Y = K^r \left(AL_Y \right)^{1-r} \qquad (1)$$

where, Y stands for outpit, L_Y is the part of labor that works in production, A is productivity or knowledge and   is a constant which expresses the output elasticity of capital. In the model, it is assumed that some part of labor force, L_A, works as researchers in the research or R&D sector and the remaining labor works in production. The fraction of population that works in the R&D sector, $s_R = \dfrac{L_A}{L}$, is assumed constant in his paper. ($L_Y + L_A = L \quad and \quad L_Y = \left(1 - s_R\right)L$). Also population grows at a constant rate n: $\dfrac{\dot{L}}{L} = n$.

A, as the stock of knowledge or ideas, is assumed to be an endogenous factor which means that it is supposed a mechanism of how the stock of knowledge grows over time. In particular, production function for ideas is described as follows:

$$\dot{A} = \bar{u}L_A \qquad (2)$$

where, L_A is number of workers belonging to the R&D sector. According to the equation (2), the stock of knowledge, A, increases when there is more manpower working in R&D sector. $\bar{u}$ denotes productivity of a researcher and one more researcher can also add the stock of knowledge by $\bar{u}$ units. For the overall economy, productivity would depend on the available stock of knowledge/ideas. It represents that the productivity of a researcher, $\bar{u}$, can be an increasing function of the current stock of knowlegde which describes spillover effect. On the other hand, it is argued that the most obvious ideas/knowledge are discovered first and for upcoming researchers it becomes harder to find new ideas which demonstrates fishing out effect. This explanation makes the implication that research productivity is a decreasing function of the current of knowledge. Thus, allowing both possibilities a function is written as follows:

$$\bar{u} = u\, A^{w} \qquad \text{where, } u \text{ is constant.} \qquad (3)$$

where, w is stock of knowledge which respect to productivity of a researcher. When $w > 0$, it can be said that research productivity is an increasing function of the current stock of knowledge which interpreting the spillover argument. Therefore, when $w < 0$, then research productivity is a decreasing function of A which giving the meaning of fishing out argument. If $w = 0$, then the productivity is not a function depending on the current stock of knowledge, A. Thus, the stock of knowledge evolves according to function (4).

$$\dot{A} = u\, A^{w} L_{A} \qquad (4)$$

As mentioned above, an individual researcher takes $\bar{u}$ as a constant due to an effort of a researcher being much small compared to total stock of knowledge in their field. But, when aggregate research effort is taken, total stock of knowledge have a positive spillover or a negative fishing out effect on the production of new ideas/knowledge.

The main result, growth rate of A is equal to growth rates of *y* and *k* at steady state path. Using the capital accumulation equation, $\dot{K} = s_{K} Y - uK$, it is clear that *K* have a constant growth rate at steady state path, *Y/K* is also constant. Then *y/k* is constant

exhibiting the growth rates of *y* and *k* are equal, $g_y = g_k$. Consuming the production function to explain this process, $\dfrac{\dot{y}}{y} = r\dfrac{\dot{k}}{k} + (1-r)\dfrac{\dot{A}}{A}$ and that growth rate of *y* to be $g_y = rg_k + (1-r)g_A$. This result indicates that the economic growth depends on technological growth (knowledge growth).

Consider (4) $\dot{A} = u A^w L_A$ and in order to derive the technological progress endogenously, the equation is divided by *A*, $\dfrac{\dot{A}}{A} = \dfrac{u\,L_A}{A^{1-w}}$. On the balanced growth path, technological growth rate g_A ($g_A = \dfrac{\dot{A}}{A}$) will also be constant. Using Take Logs and Differentiate technique, the result will be $\dfrac{\dot{L}_A}{L_A} = (1-w)\dfrac{\dot{A}}{A}$. As mentioned above, growth rate of number of researchers is equal to growth rate of population, *n,* (since it is assumed that $s_R = \dfrac{L_A}{L}$ is constant). After all, the growth rate of knowledge (technology) is equal to $g_A = \dfrac{n}{(1-w)}$.

The long-run growth rate of output per worker in this model depends positively on two factors:

➢ Stock of knowledge which respect to productivity of a researcher, w, or the strength of the "standing on shoulder" effect which the idea stemming from Isaac Newton's observation "If i have seen tarther than others, it is because i was standing on the shoulders of giants". The more past inventions help to boost the rate of current inventions, the faster the growth rate will be.

➢ The growth rate of number of workers, n. The higher that amount of it, the faster the economy adds researcher. This would seem somewhat unusual prediction, but it holdswell when a very long view of world economic history is taken. Prior to the industrial revolution, population growth rate and GDP per capita were much low. The past 200 years have seen bothpopulation growth and economic growth rate increases(Charles, I.Jones, 1995).

In conclusion, main contribution of Charles I. Jones based on Romer (1990) was endogenizing technological change emphasizing nonrivalry character of knowledge (ideas), in turn long-run economic growth could be explained concerning its diffusion (technological diffusion) in the economy. As implied in this model about the character of knowledge, it can be concluded that the spillover effects of FDI on recipient country is natural, because of non-rival character of knowledge explaining that if one firm uses an idea, it does not prevent others to use it.Ozturk Ilhan (2007) mentioned, the spillover effect to host economy in presence of Multinational Corporations (MNCs) may be settled through demonstration and imitation (domestic firms to imitate new technologies from foreign firms); increasing competition by letting foreign firms to enter and make pressure on domestic firms to adjust their activities and to introduce new tecnologies; and training which the worker trained or acquired knowledge from foreign companies can work at domestic company or even create their own business and domestic firms, therefore, upgrade the skills of their employees to let them dealing with new technologies. Thus a significant growth – stimulating character of FDI is the advanced technology that can be penetrate to economy of host country.

Since how ideas or knowledge spreads in an economy is explained by mathematical method above, more detail representation concerning FDI as a stimulator for economic growth should be considered. For this concern, this chapter will last as follows: (i) determinants of FDI, (ii) characteristics of Multinational Corporations (MNCs) as FDI bridged by them (role of MNCs in host countries), (iii) advantage and disadvantage of FDI on recipient economy and (iv) channels of FDI benefits converting to host country's economy.

1.1.2 Determinants of FDI

Mere one factor cannot be exact determination for FDI and furthermore candidates which can determine FDI should be multiple. On one hand some economic variables such as the size of gross domestic product (GDP) and its growth which induce MNCs to choose the investing locations (which countries MNCs have to invest in) will be the main determinant for creating FDI. On the other hand, since the significant effect that host economy could absorb from FDI is the assimilation of valuable knowledge in the form of production technology, marketing skills and managerial expertise, these facets can be determinant from host countries

engendering FDI which means that if there is no positive FDI spillovers to host economy, FDI could be prohibited from side of host country through political factors such unpleasant tax environment. All in all, it could be said that determinant factors of FDI can come from two sides as follows:

1. The factors that MNCs making decision to invest abroad (especially factors exerting locational advantage to them)
2. The factors that host country absorbing positive spillovers of FDI

OLI paradigm by Duning is the most extensive approach interpreting the determinants of FDI capturing the implication mentioned at first. OLI is a short hand of three different classes of factors determining FDI: Ownership advantages (O), Locational advantages (L) and Benefits of Internationalization (I). L type advantages are external factors to the firm while O and I type advantages are relevant to internel. As Marco Neuhaus (2006) considered, L type advantages seem to be of the highest relevance for FDI flows from developed to developing countries. Concerning on this viewpoint, L type of advantages is mostly discussed in the thesis.

L–type advantages are considered in detail below. After reviewing the locational advantage factors, the point will turn into the explanation of factors concerning host countries' absorptive capacity as secondly mentioned above.

1.1.2.1 Factors of locational advantages

These L-type advantages are more relevant factors giving host countries locational advantages over other competitive recipient countries and host country's market size, input costs, economic and political factors, and openness and integration related factors are in its list.

Input costs: It is obvious that profit-seeking firms strive to decrease their production cost and increase its gain from their activity. Costs of labour, energy, communication, transport and raw materials are included in input costs. Labour input costs, for example, are important for firms facing labour intensive production. Furthermore, gain could stem from the productivity of the labour force, not only from the wage levels. Therefore foreign investors are interested in unit labour costs which can show the quality of current labour force, but cannot necessarily reflect the capability of the labour force to adapt new technologies. In order to capture this problem, foreign investors additionally look at the prevalent level of human capital in the country.

Market-related factors: Host country's market size in terms of its gross domestic product or amount of population is reflection of capacity of consumers as a demand for the output of products and services to foreign firms. Sometimes market size of the neighbouring countries is additionally taken into account for more accurate measure to market size. This factor is mostly the matter to market-seeking firm which tend to use host country's domestic market referring the idea that ''larger the recipient country market size, the more the investing firms can gain''.

Despite getting big amount of buyers, larger market size promotes potential economies of large scale production and can reduce the fixed cost of MNCs. Moreover, investors prefer markets with high sustainable growth rate which gives them reliable strategy relying on the expectations regading the size of growth of future market potential not only concerning present market potential.

Other market-related factor that impact on a decision process of MNCs about the location of FDI is the need to protect their market shares or to overcome market entry barriers closely linked with the size of the potent market. Restrictions to FDI such as capital controls, strict approval requirements and limitations of profit repatriation can make pressure on MNCs' decision.

*Economic and political factors:*Fiscal discipline, amount of unemployment, degree of inflation rate, sustainable economic growth rate and exchange rate risk can be thought as macroeconomic stability factors. Lack of macroeconomic stability will be a reason of high degree of uncertainty to investors. A stable macroeconomic circumstances paves the way for solid growth which in turn inclines the market potential, stabilizes the economy and eventually may propel the country into a virtuous circle (Marco Neuhaus, 2006).

Among political stability factors, it could be found that a policy to conduce FDI, for instance, no capital controls or no other direct barriers to FDI; a market supporting tax regime such as a moderative level of corporate taxes and no confiscatory taxation; strong legal regulations including transparency of the legal system, high willingness to enforce the law, protaction of property rights and repatriation of profits; a low level of corruption and a high level of price liberalization.

Factors related to openness and integration: At global level, FDI through channels concerning with the direct consequences of a liberal trade regime and a part of a supranational trade agreement for the location of an FDI can be the basis of an economic and political integration of a country. Finding a location for an FDI by

Multinational Corprations (MNCs), especially for an export – oriented activities is often linked to a more liberal trade regime and particularly with a membership status in a supranational trade establishment. As a core factor to MNCs for decision - making of choosing investment location, potential market access can be enlarged by trade agreements with neighbouring countries of an economy and that country must be more lucrative to FDI.

As scholars argued, the factors above will not be taken alone so that MNCs to get decision for location. Khondoker Abdul Mottaleb and Kaliappa Kalirajan (2010), for example, identified the factors that determine FDI inflow to the developing countries using panel data from 68 low-income and lower-middle income developing countries. Based on their result, countries with larger gross domestic product and its growth rate, achieving higher share of global trade and more business – open sircumstances are able to have progress in receiving more foreign investment.

1.1.2.2 Factors of absorptive capacities

As mentioned in theoretical literature above, new growth theory provides powerful support for the linkage among FDI and economic growth that impact of FDI is a potent factor on the economy of host country through knowdlege penetration. Due to this aspect, a lot of countries, in particular, developing countries accept FDI as a considerable element in their growth strategy and make an effort for attracting it. In fact, the exploitation of positive spillover of FDI requires conditions as well-known as "absorptive capacity" from host countries. As Simona-Gabriela (2008) concluded that such conditions refer to level of human capital, economic and political stability, market liberalization and competitiveness, sufficient infrastructure building, level of national income per capita and developed financial institutions.

According to Xinfeng Ya, Majagaiya and Kundan Pokhrel(2011), FDI is a basket of intangible assets known as technology, capital stock and production know – how and can foster the available stock of knowledge in the host country through training of labour, acquisition of skills and introduction of efficient management and organizational arrangement and mostly their diffusion throughout the economy. Since process taking knowledge spillover from MNCs can only be handled by labour force of the host country, it is essential to have favourable labour which is able to work with the technology and know – how. The results of regression analysis in a study by Balasuramanyam, et.al indicate that on overall economic growth, FDI has positive

effect and magnitude of the effect literally depends on the level of human capital which is available in the host country. In other words, this is the nature of the interaction between human capital and FDI and also they emphasized that for countries with very low level of human capital, the FDI's impact on host economy is negative. Zahid Iqbal and Kosar Abbas(2015) has studied macro empirical work on the relationship of FDI – growth in developing countries and they found that FDI has a positive impact on overall economic growth concerning number of variables such as the human capital base in host economy, banking system, financial market regulation, trade regime and degree of openness of their economies.

Extensive study dealing with the absorptive capacity of host countryby H. Nguyen et.al (2009) concludes that absorptive capacity of domestic firms and also human capital are vital determinants for transfer of technology spillover to the host economy. Ultimately, if the recipient country has educated lobours, then new technologies and modern techniques can be quickly absorbed to the country. Other way of absorbing high technology is domestic enterprises which can easely assimilate managerial skills, know – how and the high – level of technology by imitating or being partners for foreign one's activities. For supporting the business, disburse investment capital in particular and transfering raw materials or finished goods, financial system and infrastructure is other significant factors for taking the positive impacts from FDI to domestic economy. Lastly but not least, institutional accomplishment is indispensable. It can be either a barrier or grease to the absorptive process by public administration system and policies. To conclude, a host economy must have a initial level of condition in terms of financial system, absorptive capacity of local firms, human capital, physical infrastructure and institutional development in order to take advantages to their economy from FDI.

Similar to the idea above, Ozturk Ilhan (2007), for instance, highlighted the crucial factors for determinants of FDI. As the author's finding, those factors include the human capital base, banking system, market size, financial market regulation, trade regime, free trade zones, tax incentives, economic and political stability, infrastructure quality and regional integration. Therefore, it is argued that the productivity of foreign capital is relevant with the fundamental conditions in the recipient country. Moreover, the adoption of advanced technologies by less developed countries is not free and requires effort and capability (Onyeagu Augustina Nkechi, 2013). The aforementioned studies provide some evidence for the

claim that a positive effect of FDI on economic growth is realized only when a particular dimension of the local conditions exists in a host country (Suleyman Taspinar, Osman Dagon, 2015).

All in all, MNCs can bring important benefits by choosing the location for investing in FDI-receiving country, but the host country can not automatically convert those benefits into their economy. When it is observed that the studies sited above, there is a similar aspect between the factors that can be determinant of FDI induced by locational decision as well as absorptive capacity of host country. The idea that same factors can make benefit for two side is momentous, but it is critical that less developed countries are often characterized by low levels of education (under-skilled labour force), poor infrastructure (electricity, roads and hospitals etc) and low levels of financial development. So that we can have more understanding of growth effect of FDI by bringing the discussion of owners (MNCs) making decision to abroad.

1.1.3 Characteristics of Multinational Corporations

The Foreign Direct Investment (FDI) that a process of a capital shifting to a economy from the other one is a decision made by Multinational Corprations (MNCs) for their gain at one hand and a decition by a host country to receive it for promoting its economy. Ozturk Ilhan (2007) has distinctly expressed the point such that the importance of economic growth attracting FDI is closely connected to the fact that FDI tends to be an important component of investing firm's strategic decision. Particularly, a Multinational Corprations (MNCs) are enterprises engaging in FDI and put their control on value adding activities in more than one country. Moreover, rather than holding a passive financial assets, an MNC is engaged in an active management of their subsidiaries (Dinh Thi Thanh Binh, 2009). It is generally highlighted that a firm as a profit – seeking private company, MNCs only invest in a foreign country when their expected profit is positive. To explain in detail, every firm has certain amount of capital possible to invest, in turn they want to derive the highest rate of return on that investment and the firm must prefer to invest abroad as long as the income they expect to earn will be greater. Only in case of the some adventages that investing company possesses over its foreign competitors and sufficient to compensate for the disadvantage of operating a subsidiary at a distance, MNCs make an investment decision to other country (Claes Friberg och Gustav Lovén, 2007).

Moreover, according to Hymer (1960) as quoted by Selma Kurtishi-Kastrati(2013), there are two reasons for firms becoming MNCs:

1. Market imperfections. It can be described as anything that intervenes with trade and it comprises structural, arising from structural deviations from perfect competition in the final product market because of exlusive and permanent control of proprietary technology, privileged access to inputs, control of distribution system, product differenciation and scale economies, but in their absence, markets are perfectly efficient. When the companies possess competitive advantages, they become MNCs and in order to maximize their productivity, they apply the competitive advantage in different locations/countries.

2. Due to their competitive structure, some industries would exhort firms to internationalize than those in other economic activities.

This is as meaning of that O and I advantages are core for MNCs becoming a international entrepreneur. These two are closely tied by which "market imperfections created the opportunity to internalize transactions within a firm. Instead of conducting business externally between two firms – in separate countries, it made sense to instead maximize profits by doing business internally across national boundaries" (Selma Kurtishi-Kastrati, 2013).

On this basis, as Maria-Ramona,S. and Iuliana Mazur c s,G. (2014) determined, four major motivations that MNCs internationalize through FDI:

1. Market seeking. The more big market a country has, the more market intencive to MNCs. Moreover, local or regional market is the core motivational factor to capture for MNCs in order to achieve huge customers and overcome trade bounds, therefore, existence of liberal trade regimes are crucial to attracting such investors. In some cases, providers would be prefered following client companies, for instance, in an automotive company. It can be considered that the importance to invest in this category are market size, future market forecast or market growth and competition or company's market share.

2. Resource seeking – when quality of resources are high and able to obtain them with lower cost, it must be an issue for MNCs to invest in that country than in their home country. Basically, unskilled or average skilled labour, natural resources is referred to.

3. Strategic assets seeking – It can be concerned with the purpose of MNCs to pursue a global or regional integration strategy and to keep their power in competition in an unknown environment in order to ensure competitivity of their companies. This category of investment is relevant to the companies decisions to purchase certain kind of assets or entering into an alliance so that they can promote their long term strategic interests. A MNCs, for example, can buy a local company including participation in the privatization of state owned enterprises to build the presence of target market. Especially in developed countries, FDI is existed for this purpose.

4. Efficiency seeking – This category of investment can often be found in a stage of the operations that is taken by a foreign investor which invests for new market or natural resources and strengthen the business by investments concentrated at enhancing efficiency. The investments motivated by efficiency seeking are made when the investor has long – run plans if access to well developed markets is free.

On the one hand, it is undertaken to progress the interests of the investing unit. On the other hand FDI is exerted by MNCs which are at the forefront of global Research and Development activities and that applies most advanced technologies. By building up a production plant in the host country can be meant that those firms immediately utilize new production technologies in the country. From this view of point, MNCs can be described a "distributor" of technology and production know – how and that is the reason to developing countries striving to attract FDI. Therefore, it is noticeable that the importance of economic growth to attract FDI is closely relevant to the fact that FDI tends to be an crucial component of investing companies' strategic decisions. Furthermore, it must be realized that MNCs are not for the business of economic development of any countries and not interested in the explicit transfer of technology/knowledge. Instead of spreading it, they prefer to employ technologies that are suited, first and foremost, to their own needs and goals for which they have created the investment. MNCs do not make available their proprietary assets at the whims of governments, rather they tailor their investment decisions to the existing market needs and the relative quality of location advantages, especially skills and capabilities in which the domestic economy has a comparative advantage (Marco Neuhaus, 2006). The thoughts make someone's

mind to explore what the advantages and disadvantages of FDI to host countries can be.

1.1.4 Advantage and disadvantage of FDI on recipient economy

Historically, as Simona-Gabriela (2008) considered that the perception of FDI was negative in 1960s and 1970s that has changed by a positive one in 1980s and 1990s. The reasons of MNCs and their investments broadened more and more attractive was, as Simona-Gabriela, M. S. (2008) argued,

1. To access other financial sources, official or private, was restrictive and
2. The MNCs could increase the technology and know – how transfer from one to other country.

Since, the significant capital stock accumulation and qualifications, knowledge and technology in a production processare the cause of economic growth, positive effect of FDI on economy of host country should be. If there are positive externalities emanating from MNCs, domestic firms may improve their productivity, although domestic firms can be affected adversely if competition with MNCs reduces output for domestic ones and thus leads to reductions in productivity (Sourafel Girma & Holger Gorg, 2005).

Many could argue that given appropriate policies FDI can play a significant role in the process of creating a better economic performance on the one hand. Potential drawbacks exist, embodying a deterioration of the balance of payments as profits are repatriated and adverse impacts on competition in domestic market through crowding out effect on the other hand. Regardless, even crowding out does take place, the net effect generally remains beneficial, not least as the replacement tends to result in the release of insufficient domestic funds for other investment object (OECD, 2002). We can generally see the advantage and disadvantage of FDI on host country's economy by separating them into two parts as mentioned below.

1.1.4.1 Host country benefits from FDI

As discussions above that we have considered till now, a bundle of intangible assets such as technology, management know – how, skills and information of new

markets which are relatively scarcely available in developing countries can be brought by Foreign direct investment (FDI) initiated Multinational Corporations (MNCs). Despite bringing those, FDI can enlarge number of employment, bring foreign currency and boost competition between local firms. These are briefly explained below.

1. Resource transfer effects. It is obvious that FDI can be the source of capital, technology and management skills that would not be able to use in a country receiving FDI. Expecting to assimilate this significant advantage mostly less developed countries make effort for bringing MNCs into their boundaries.

2. Employment effects. Another important advantage host country could deserve is increase in employment which in turn can be cause of decrease in poverty. Especially it must be appeared in horizontal type of FDI. According to Imamul Haque,S. M.and Ishfaq Ahmad Thaku study paper, since the early 70s many East Asian developing countries including China have attracted FDI by pursuing export – led growth strategies and have been benefited enormously from export – oriented FDI in labour intensive industries (Imamul Haque,S. M.; Ishfaq Ahmad Thaku, 2013). In particular, China and India which their study concentrated on are huge cheap labour market which can be fit on efficiency-seeking FDI policy. The character of creating much employment in host country has the advantage of increasing income, decreasing poverty and in turn to boost economic growth. Therefore, spreading to shift to other local firms, the workers who worked at MNCs can be the convertor of new idea and skill which is acquired to them.

3. Amplifying Public budget revenue. By the motivation from a country's government such as certain tax incentives, investors can deserve some gain but in return budget revenues of the government increace due to increased revenues from payroll taxes as the result of job creation or of higher wages. By the view of this point, FDI can be understood as a new contributor to the economy. However, in case of export oriented FDI, MNCs activities lead to a growth in foreign exchange inflows in beneficiary country (Maria-Ramona SÂRBU; Iuliana Mazur c s. GAVREA, 2014).

4. Effects on competition and stimulating domestic investments. Foreign direct investments or MNCs basically with their superior endowments of technology may induce to an increase of domestic investment because of they may compel locally owned firms to invest in learning if local firms only to keep abreast of the competition.

Therefore, by the link between their activities, domestic companies may become suppliers to the foreign investors and gain access to their distribution infrastructure and can learn at least from watching (Balasubramanyam et.al, 1996).

5. Balance of payments effects. Whether MNCs operation is a substitute for import or to export of goods and services, it can support to achieve a current account surplus. Also they could bring to local firms to access the way of reaching global markets and increase in export.

1.1.4.2 Host country's disadvantages from FDI

Theoretically, FDI non-enhancing growth arguments are originated from two main schools which are the social anti – capitalistic based on Marxist theory and the Dependencia school of Southern and Centrel America (Manuela Tvaronaviciene et.all, 2009). According to Marxism or conceptually similar theories, the exploitation of the surplus created by using other's power is the functions of capitalist system and the fact that economic underdevelopment of the low – income countries can essentially be explained by the exploitation and alienation occured on national or worldwide range. Concerning their thought with the concept, Marxists ignore a private investment and compare foreign investment with "Trojan horses of Western colonialism and imperialism against the third world".

Like Marxist concept, the Dependencia school is disagreed the positive growth impact of FDI and this view emphasizes existence of a dependent relationship refering a sutiation in which a certain group of countries have their economy conditioned by the development and expansion of another economies which leads to the dependent countries' backwardness and its perpetuation. These theories ascribed apparent difference in the development between the North and South to the fact of exploitation of the periphery of the world economy indicating the developing countries by politically and economically overpowering centre describing the industrialized countries. By the view of the proponents of the Dependencia school, so that those centres can fully exploit and control the potential power in the world economy, they have been building oligarchies in developing countries. As a matter of concern, FDI is properly regarded as a link between the centres of the world

economy and its periphery and the macro and micro economic effects of the investments do not matter in line with this argument.

MNCs distorting local economy by squeezing out local entrepreneurs, by changing host countries' culture imposing alien customer tastes and preferences, by aggravating distribution of income and by using capital – intensive technologies contributing higher level of unemployment are the other line of arguments dealing with non-existence of possitive effect of FDI on host economy. In addition to these, the preposition that foreign investors undermine political processes by structuring host authorities, home governments and international systems to respond to their own multinational needs.

All in all, the denial of FDI could be concluded as follows.

1. Adverse effect on competition. The subsidiaries of MNCs may have greater economic power than domestic competitors due to being a part of a larger international organization. It could allow MNCs to drive indigenous competitors out of the market and create a monopoly position in that economy.

2. Adverse effect on balance of payment. There is a possible adverse effect of FDI on balance of payment of a host country especially when the capital outflows as foreign subsidiaries repatriate the earnings to the parent country.

3. National sovereignty and autonomy threat. FDI can mean some loss of economic independence. Considerable decisions that can affect on the host economy would be made by a foreign parent company that has no real commitment to the host country and over which a government of the host country has no actual control.

To conclude, FDI by MNCs tends to act as a catalyst for underlying strengths and weaknesses in the host economy bringing to the fore both advantages and its problems. There is a phenomenon that positive spillover effect of FDI is more than that of its disadvantages as much better as host country's absorptive capacity. The benefits of FDI do not accrue automatically and evenly across countries, sectors and local communities. For now, turning the discussion of how or by what channel those advantages can take place in host economy is fruitful.

1.1.5 Channels of positive spillovers of FDI to host country's economy

It is often confirmed that the main contribution ofFDI is found as an important channel of international technology transfer, of so, next question must be appeared that by which channel it can be existed among host economy. Multinational Corporations (MNCs) create a dynamic link to the global frontier of best practices, most high level technologies and sophisticated operational techniques in an industry/economic activity. Simultaneously, they are able to generate direct and indirect spillovers and externalities for domestic suppliers. FDI that creates a proprietary network of suppliers introduces a powerful interaction between parent and subsidiaries, and between subsidiaries and domestic economy of host countries (Atrayee Ghosh Roy and Hendrik F. Van den Berg, 2006). Therefore, the channel of how positive effect of FDI transfers onto host economy must be found in capital formation, technology transfer, human capital namely knowledge and skills enhancement and so on.

Simona-Gabriela(2008) shows that FDI boost the competition as a result of better resource allocation, efficiency in capital use and renouncement to the inadequate managerial practice; all that generate productivity improvement. Adams (2009) provides two main findings. First, augmentation of domestic capital and enhancement of efficiency through the transfer of new technology, marketing and managerial skills and innovation or best practices; and Second, FDI has both benefits and costs, and its impact is determined by the country specific environment initially and the policy settlement in particular in terms of ability to diversify, the level of absorptive capacity, targeting of FDI and opportunities for linkages between MNCs (their subsidiaries) and domestic investment. Furthermore, Kokko (1992) agreed with the way of technology tranfering to an economy of recipient country and the author suggested that there can be four ways namely demonstration and imitation effect, linkages between domestic firms and foreign companies, competition effect and labour training, acquisition and turnover effect.

In detail, the technology spillovers based on FDI is termed as direct type of the spillovers that occurs voluntarily from technology source such as multinationals or foreign firms to recipients such as local firms, affiliate of multinational or suppliers in host country by way embodied in the equipment supplied as like machinery, manual and equipment or disembodied in the forms of software, patents, knowledge or know

– how and skills provided by training and education activities (A. Sonmez, 2013). Furthermore, there are, particularly for the way disembodied, two linkages known as horizontal (intra – industry) and vertical (inter – industry)and horizontal linkages occur from foreign firms to local firms operating in the same industry while vertical spillovers occur from foreign firms to local ones operating in vertically linked different industries.

More detail study dealing with the matter of how technology spill over to host country firm, Lorraine Eden et.al, considered as follows.

First: by the demonstration effect. Local firms attempt to copy the technologies of MNCs' product or process. It occurs as reduced geographic and operational proximity spreading information flow among firms and facilitates learning by the incumbent firms. Technology should spread most easely when the producer and potential user are already in contact so that linkages exist.

Second: by learning – by – doing. Backward and forward linkages between the MNC and its suppliers or buyers to facilitate local firms learning by doing, creating a mechanism that reduces the provision costs of technology transfer. Ot occurs as linkages among firms to force all firms/partners to adopt common routines, industry norms and acquisitions standards etc. Such conformity, on the surface, should reduce costs of transaction as exchange is governed by widely shared procedures and thus new procedures do not have to be created for each transaction. However, at a more abstract level, conformity will cause technologically dificient firms to operate in manners similar to those firms possessing valuable technologies. As such, technologically deficient firms may be forced to mimic the actions of technologically superior firms, resulting in experiential learning by the prior.

Third: by training of local employees. Employees hired by technologically-inferior foreign firms can provide a more highly skilled labour pool for other firms and a potential source of new startup enterprises, thus diffusing the knowledge throughout local markets and creating an external benefits for other local firms.

Fourth: by competition effect. Entry of an MNC engenders more competition among an industry, because local firms are forced to use existing technology more efficiently or to upgrade their technology in order to remain competitive. Such entry makes pressure on existing firms threatened with loss of market share. In the situation, their response may be more efficient utilization of available technology or to renew, either following the entrant or pursuing their own technology track.

From the view of all above, it can be summarized that FDI have spillover effect transferring new technologies better than that of domestic ones, updating marketing and management skills and production know-how by backward (suppliers) and forward (buyers) linkages' activities, turnover of employees trained by MNCs (mainly their affiliates) and decreasing the market share to local competitors in turn stimulate their competition. When they assimilate it into local firms' activity, it can be shown by their productivity enhancement. Thus far, how FDI affect on an economic growth of a host country has been discussed and now it is nessecity to consider what results researchers have reached in this frame empirically.

1.2 Review of empirical literature

The growth effect of FDI has motivated a voluminous empirical literature focusing on both developing and developed countries. Some of them find a significant positive link while others do not and some others has delved into the performance of sectoral growth effect of FDI on economy (specifically to host country's economy).

1.2.1 Review of empirical studies for overall growth – FDI nexus

Tremendous empirical works has been analysed concerning the topic of growth impact of FDI in any field namely firm, a country and coss-country cases using many kind of methodology during last three decades. Leonid Melnyk et.al (2014), for instance, investigates the impact of FDI on economic development of 26 transition countries. Using regression analysis for panel data of 26 transition economies over the period of 13 years, they detect significant result that FDI influence on economic growth of host countries.

Zahid Iqbal and Kosar Abbas (2015) determined the economic growth of Pakistan using some factors including FDI exploiting the time period 1960-2012. Employing co-integration technique, they have found that FDI is one of the important factors promoting long run economic growth in Palistan. In the case of Ghana, Onyeagu Augustina Nkechi (2013) examines the impact of FDI on economic growth and the role of human capital in the enhancement of FDI inflow into the country using a cointegration. The Author using error-correction mechanism has obtained that FDI

has a positive significant effect on economy of Ghana in the long run and also does human capital.

Ozturk Ilhan (2007) and Mohammad Amin Almfraji and Mahmoud Khalid Almsafir (2013) have reviewed the existing studies which concentrated on growth impact of FDI. According to Ozturk, I. (2007), 38 out of 52 studies that was conducted in the review had shown positive relationship between economic growth and FDI. The author concluded that FDI tends to have significant effect on economic growth through multiple channels such as capital formation, technology transfer and spillover, human capital enhancement. The work by Amin Almfraji and Mahmoud Khalid Almsafir (2013) reviewed an amount of research papers examining the relationship between FDI and economic growth for timeframe of 1994 – 2012. The results show that the main finding of the economic growth – FDI relation is significantly positive according to those research papers except some cases representing negative or even null. And within the relation, there exist several influencing factors such as the adequate level of human capital, well developed financial market, complementarity between domestic and foreign investment and the open trade regime etc.

Another interesting study by Lyroudi Katerina et.al (2004) investigates the existence and the nature of the effect of FDI on the growth rate by employing a panel data, 1995-1998, on transition economies including the Mongolia. They apply Bayesian analysis and the results indicate that FDI does not exhibit any significant relationship with economic growth for the transition countries.

Studies concerning FDI in the Mongolia which is the case in this thesis have been considered few. For instance, Maralgua Och et.al (2017) examined determinants of FDI in the Mongolia utilizing Granger Gausality test, ARDL bounds testing approach to cointegration and fully modified ordinary least square for data of 1992-2014. Their estimation referred to define the determinants of FDI in case of the Mongolia was the first attempt and they assessed domestic market size, human capital, financial development, macroeconomic uncertainty, trade barriers and infrastructure level as determinant factors of FDI. The results have revealed significant short and long – run relationships between FDI and those examining variables.

To conclude, basically FDI has a positive effect on host countries' economy except some exerts negative and even ambiguous. On this basis, more detail

examinations that is sectoral effect of FDI on economic growth have been made and those are reviewed below.

1.2.2Review of empirical studies for Growth – FDI nexus in different sectors

Zahid Iqbal Kosar Abbas(2015) clarified that FDI exert positive effects on economic growth, particularly in developing countries which suffer from low productivity and capital stock deficiencies. The "spillovers" generally refers to productivity improvements resulting from knowledge diffusion from multinational affiliates to domestic firms, encompassing both technology and all forms of codified or tacit knowledge related to production, including management and organizational practices (A. Sonmez, 2013). In particular, even as mentioned above all spillover improvements from FDI can be lumped to productivity growth in country level, but those improvements contributed to productivity enhancement "such as transfers of technology and management know-how, introduction of new processes and employee training tend to relate to the manufacturing sector rather than the agriculture or mining sector" (Imamul Haque, S. M. andIshfaq Ahmad Thaku, 2013).According to Alfaro (2003), the linkage potential differs across sectors, primary, manufacturing and service sectors. She highlights that primary sector, for example, is mostly capital intensive and scope for linkages between foreign companies and the rest of an economy is often limited. Unlike primary sector, FDI inflows in manufacturing sector may have a larger impact to host economy through a broad range of potential linkage – intensive activities. For service sector, potential forward linkages can be quite strong due to the sector mostly defined by wide range of different activities such as finance, infrastructure including electricity, water and telecommunications, wholesalea/retail, real estate as well as tourism. FDI to the sector is mostly to serve the domestic market. Moreover it is interesting that the spillover effect is not equally distributed across economic sectors.

Tam Bang Vu et.al, (2006) have examined sectoral data for FDI inflows to China and Vietnam employing an appropriate feasible generalized least squares (FGLS) estimator. And they found the effect to be different across economic sectors, with all the beneficial impact limited to manufacturing. Other sectors appear to gain very little growth benefit from sector – specific FDI. Noureddine E. and Hamid F. (2016) confirm working on same purpose of study using standard OLS regression model in case of Morocco for the period from 1985 to 2014 and they find that

aggregate FDI on the economic growth is non – significant. But using evidence from FDI sectoral decomposition data, they suggest that the impact of FDI varies according to the economic sector. The result is positive and significant only in the manufacturing sector; it is whether negative or non-significant in other sectors.

The wider paper highlighted the phenomenon would be related to "Foreign Direct Investment and Growth: Does the Sector Matter?" by Laura Alfaro (2003). The paper shows that the benefits of FDI vary greatly accross sectors by assessing the effect of FDI on economic growth in the primary, manufacturing and services sectors. An empirical analysis using47 countries' data employing regression model for the period 1981 – 1999 suggests that total FDI exerts an ambigious effect on growth. Her results exhibit that FDIs in primary sector, however, has a negative effect on growth while investment in manufacturing a positive. Evidence from the service sector is ambiguous.

Referring to others' results, Chakraborty and Nunnenkamp (2006) has studied the relationship between economic growth and FDI in the case of India. The author used data from 1987 to 2000 employing Granger causality tests and Cointegration technique and found bidirectional causality among economic growth and manufacturing sector. Negative effect between economic growth and FDI in primary sector was found according to the investigation of Khaliq and Noy (2007) in case of Indonesia exploiting the data period of 1998-2006 by using a fixed effect estimation methodology.

Vu, Gangnes and Noy (2008) study the relation among FDI and industrial sector consuming Feasible Generalized Least Squares for the time period 1985-2004 in China and Vietnam's cases. As their result, FDI has a positive effect directly and indirectly with its interaction with labor on growth in the industrial sector. Other sectors gained very little growth benefit from sector specific FDI. Hooi Hooi Lean (2008) also has reached same results considering the FDI and the economic growth of the manufacturing sector in Malaysia from 1980 to 2005. The empirical finding suggests that the FDI and the growth in the manufacturing sector are independent except taking sufficiently qualified or skilled labour force into the account.

Thus, it is easy to imagine that FDI can playan important role in promoting industrialization process in the host countries' economies, because FDI is a strong vehicle for capital and technology transfer especially in manufacturing sector. Therefore, it is expected to be a positive relation between FDI in manufacturing

sector, negative to FDI in primary sector and ambiguous to service sector in this thesis as following the other empirical studies.

2. CHAPTER BACKGROUND OF THE MONGOLIA

The Mongolia is one of the "latecomers" arising among already developed world in material possession. As most emerging countries, after the former Soviet bloc degraded in 1990, the new competitive states including the Mongolia have released into the intense competition to attract Foreign Direct Investment (FDI) to accelerate their transitions toward free-market based economies. Given the perception that FDI is strongly promoted to help achieving their sustainable economic growth, improve employment conditions, accelerate modernization in industrialization program and raise living standards of the society, building and sustaining a comprehensive business-friendly climate becomes a critical challenge for the Government of the Mongolian (GoM). The Mongolia presents an interesting example as one of the less-developed transition economies, largely isolated from external sources of financial and human capital, and with virtually no historical experience of capitalism (Mehmet Demirbag, Ekrem Tatoglu, and Adiya Oyungerel, 2005)".

In this chapter, introduction of the Mongolia, review of overall patterns of its economy, policy of the government for stimulating economic growth and FDI matter in the country will be discussed. It is noteworthy that the framework of the analysis will be bound in the period since 1990.

2.1 General context of the Mongolia

The Mongolia is second biggest landlocked country (following Kazakhstan) sharing its border with two politically, economically, and militarily powerful nations, Russia and China, locating in northeast region of East Asia. On the one hand, from late seventeenth century to late 1980, dominant power of the two neighbors was high. In an essay written by I. I. Serebrennikov (1931) "The Mongolia has long been a football between China and Russia not only because of its position as a buffer state but also because of its chronic weakness. In the late seventeenth century, after its

decline from world power, it came under the dominion of the Manchu emperors which also had dominated China, until the Manchu dynasty came to an end in 1911". Cheng (2003) noted that from the 1920s until the late 1980s the Mongolia was closely tied to the Former Soviet Union (FSU) modeling its political and economic systems after the Union of Soviet Socialist Republics(USSR)'s state socialism and command economy (Mehmet Demirbag, Ekrem Tatoglu, and Adiya Oyungerel, 2005). On the other hand, at the promptly changing and globalized world the Mongolia's location has an advantage of large emerging markets of the two big neighbors.

The Mongolia has a territory of 1564.1 thousand square kilometers ranked 19th largest size of territory and the most sparsely populated country in the world. The country is divided into five regions: West, Khangai, Central, East and the capital city, Ulaanbaatar. It has 22 administrative units, namely, Ulaanbaatar and 21 provinces (aimags), which are divided into counties (soums). Livestock breeding is the main activity in all regions. The livestock sector employs about 33% of the total workforce by the end of 2016 while mining sector has been dominant in terms of export, share of FDI inflow in the country.

The Mongolia can be termed as a transition country and designated 'Low-middle income country' as World Bank's classification system. According to the World Bank Report (2002) "transition economies are formerly socialist countries in East Asia, Central and Eastern Europe and the newly independent states of the former Soviet Union". As other transition countries' situations in initial period of the transition process, after choosing market-oriented economic system, "following decade saw the Mongolia endure both deep recession, because of political inaction, and natural disasters, as well as strong economic growth, because of market reforms and extensive privatization of the formerly state-run economy" (CIA, 2016). The country started its transition or catch up process from the designation of 'Low income country' with US$ 1430 per capita GNI in 1990 turned into Low-middle income country with US$ 3550 per capita GNI in 2016.

The Mongolia is rich of beautiful nature and abundant natural resources including copper, gold, uranium, iron ore, coal, tungsten, molybdenum and phosphate which could be the attractiveness for foreign companies (basically MNCs). In particular, the country has taken first steps to use some giant mineral deposits as

"Oyu Tolgoi", the world's 2nd largest copper-gold deposit and "Tavan Tolgoi", world's 5th largest coal deposit (Enkh-Otgon.D, Baigalmaa.Z, 2009). It can be said that the discovery of the Oyu Tolgoi (OT) and Tavan Tolgoi (TT) deposits, two of the largest undeveloped copper-gold and coal reserves in the world, was promised to drastically change the country's fortune and both requires high amount of investment. The establishment in 2009 of a joint venture to develop OT attracted over US$6 billion investment which equal to 50 percent of the country's GDP and furthermore the open mine phase of development which began in 2010 started production in 2013 and, if had continued uninterrupted, would have raised copper exports to US$7 billion by 2020, further tripling per capita GDP (Tserenpuntsag Batbold, 2015).

Despite abundant of natural resources the country has dominant endowments of energetic young people prosperity. By 2016, the Mongolia is a mother country of 3,119.9 thousand people sparsely distributed throughout the country. Moreover, 43 percent of its population belongs to ages between 0-24 and 45.8 percent of them belongs to ages of 25-54 (CIA, 2016). The share of urban population is 44.2 percent and the country has a high literacy rate, for example, 98.4 percent of the population in 2016 (National Statistical Office of the Mongolia (NSOM), 2016). During the period of the country experienced a centrally-planned economy, the population growth was higher, for instance, it averaged 3.2 percent for the period 1985-1989. However, after the introduction of a market-oriented policy, population growth declined to an average of only 1 percent between 1990 and 2009 (Oyunbadam Davaakhuu, 2013) and it has little changed into 1.7percent for recent years (NSOM).

2.1.1 The Mongolia–on International platform

Despite taking attention on country context settled endowments in the country, the Mongolia can be described on some aspects by some of World designation in order to define its status among other nations. Comparing some index by international organization as shown in Table 1 below, the Mongolia is a country with not high competitive, less corrupted, quite easy for doing/starting business and aligning with Thailand and Costa Rica in the middle by innovation index.

Table 1: The Mongolia on some of World Rankings, 2017.

Organization	Survey	Ranking
World Economic Forum	Global Competitiveness Index	101 out of 137
World Intellectual Property Organization	Global innovation Index	52 out of 127
Transparency International	Corruption Perceptions Index	103 out of 180
World Bank	Ease of doing business	62 out of 190
UN development programme	Human development index	92 out of 188 (2015)

(Compiled by writer)

Among the international measurements, Doing Business presents quantitative indicators on business regulation and the protection of property rights. By this indicator the Mongolia ranks 62 for 2017. Moreover, of the 11 indicators taken into its account, the country stands at 59 for ease of opening a business (in front of China (93), Japan (106)). This takes the meaning that starting a business, dealing with construction permits, access to electricity, registering property, getting credit, protecting minority investors, trading across borders, enforcing contracts and resolving insolvency are not troublesome in the Mongolia.

According to Corruption Perceptions Index which ranks countries and territories based on how corrupt their public sector is perceived to be, the Mongolia is the 103rd (with score of 36) corrupt nation out of 175 countries in 2017.It was ranked at 72nd in 2015 and 87th in 2016. Therefore it means the country has leveled up by 16 positions in 2017 compared to the previous year. Since "corruption is one of the difficulties when foreign firms invest in transition economies … and the extent of corruption in the host country might significantly affect the inflow of FDI by affecting the efficiency, productivity" (Khondoker Abdul Mottaleb, Kaliappa Kalirajan, 2010), the Mongolian condition in terms of corruption matter can be one of positive aspect for MNCs to invest in the country.

The World Economic Forum, which has been measuring competitiveness among countries since 1979, defines "Competitiveness" as the set set of institutions, policies and factors that determine the level of productivity of a country". The Global Competitiveness Report which assesses the competitiveness of 137 world economies using a mixture of quantitative and survey data ranks countries oberall by combining 113 indicators grouped under 12 pillars of competitiveness constituting institution, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication and innovation. Competitiveness index in the Mongolia averaged 3.75 points from 2007 until 2017, reaching in all time high of 3.90 points in 2017 and a record low of 3.43 points in 2010.

Figure 1: The Global Competitiveness Index, 2017 – 2018, the Mongolia.
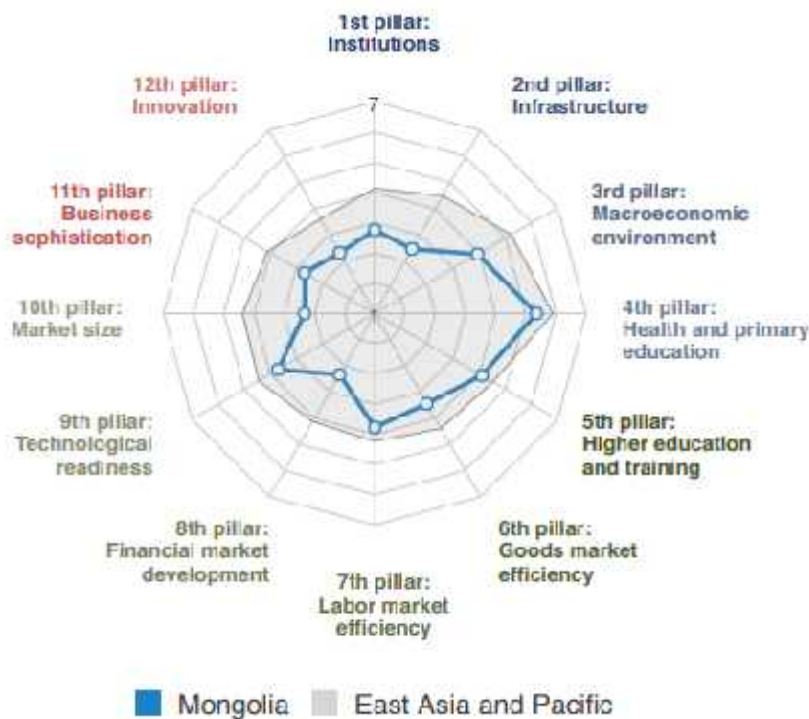
(World Economic Forum, 2017 – 2018)

From the 12 pillars of competitiveness as shown in Fig.1 above, infrastructure, macroeconomic environment, market size, labour market efficiency and financial market development are mostly relevant to attracting FDI. Indeed, the factors for the Mongolia are weak comparing to region's average, especially market size and

financial market development which are crucial to decision making for MNCs locational advantage.

2.2 Pattern of the Mongolian economy

Host countries' ability to use positive spillover of FDI as a means to accelerate economic growth depends on the context (OECD, 2002). As mentioned above the Mongolia started its transition process creating free-market economy in 1990. Following the collapse of the Union of Soviet Socialist Republics (USSR) and the end of Soviet economic assistance in the early 1990s, the Mongolia experienced a painful economic transition. The country experienced a deep recession, with real GDP falling to its lowest level ($0.77 billion, or $339 per capita, Development Indicators, WB) in 1993, inflation soared to more than 300 percent per annum, the government budget deficit reached about 15.7 percent of GDP in 1991 and the unemployment rate was at its highest levels during the 1990s reaching almost 10 percent in 1994 (see Table 2). The reason, according to World Bank (1992) was that the Mongolian economy was highly integrated with the other planned economies of the Former Soviet Union (FSU) and the Council for Mutual Economic Assistance (CMEA) during the planned economy phase. As the economy was heavily reliant on the FSU for its trade, financial and technical assistance, it faced the twin external shocks of the cessation of capital flows from the FSU and the collapse of the CMEA in 1991.

Table 2: Some economic indicators, the Mongolia, 1990-2016.

Year	Per capita GDP (current US$)	Inflation rate (%)	Budget surplus/deficit (% of GDP)	Unemploy-ment rate (%)	Share of manufacturing to GDP (%)	Share of value added in private sector (%)	Trade (% of GDP)
1990	1172	n.a	n.a	n.a	20.99	n.a	58.62
1991	1073	52.7	-15.67	6.78	18.82	n.a	136.60
1992	587	325.5	-9.55	7.66	19.78	n.a	65.30
1993	339	183.0	-12.47	8.60	17.64	n.a	129.74
1994	406	66.3	-9.81	9.00	17.88	n.a	99.16
1995	632	53.1	-5.91	5.50	18.25	n.a	82.10
1996	581	44.6	-7.89	6.70	8.18	n.a	77.97
1997	505	20.5	-9.81	7.70	9.11	n.a	99.99
1998	477	6.0	-14.28	5.90	7.66	n.a	107.35
1999	445	10.0	-12.58	4.70	7.71	70.3	112.24

2000	474	8.1	-7.72	4.60	7.55	72.2	121.89
2001	524	8.0	-4.53	4.60	9.46	75	115.82
2002	572	1.6	-5.92	6.20	7.27	74.5	118.52
2003	646	3.3	-4.24	6.80	7.48	73	120.30
2004	798	8.24	-1.83	3.60	6.24	71.3	131.33
2005	998	12.72	2.64	3.30	6.42	71.9	122.38
2006	1335	5.10	3.32	3.20	6.04	67.9	112.93
2007	1634	9.05	2.69	7.20	6.93	68.4	117.88
2008	2140	25.06	-4.52	5.60	7.31	72.5	121.20
2009	1718	6.28	-5.2	5.90	7.08	73	107.81
2010	2650	10.15	0.43	6.50	7.59	73.4	103.35
2011	3770	9.48	-3.91	7.74	8.09	77.8	127.00
2012	4369	14.98	-6.21	8.23	8.42	78.7	109.59
2013	4385	8.60	-0.93	7.91	9.84	80.1	100.31
2014	4182	13.02	-3.73	7.95	9.68	79.9	109.32
2015	3947	5.78	-4.99	7.45	8.32	80	90.35
2016	3694	0.55	-15.36	6.69	7.28	81.4	97.58

n.a – data is not available

(Development indicators-WB, National Statistics Office of the Mongolia (NSOM))

Standards of living of the majority of the population were transformed over the 20-year period with the US$ 4182 per capita GDP in 2014 being about twelve times that of 1990 (Table 2). The Mongolia's Government has made policy efforts to reach this level of living standards. The government embarked on a reform agenda in 1990 to try to stabilize the economy and create a private sector-led open economy. The reform agenda included: the liberalization of state controlled prices and tariffs, the privatization of state-owned properties, the liberalization of the trade and investment regime, the establishment of a two-tier banking system, the adoption of a floating exchange rate, and the creation of a favourable legal environment for private sector development (Oyunbadam Davaakhuu, 2013). All was aimed towards macroeconomic stabilization, coupled with high world copper prices paved the way for expansions in trade and increases in FDI (Maralgua Och, et.al, 2017).

The core element of the reform program supporting was the privatization of state-owned companies. UNIDO (2002) the early year of the process was quite difficult to the Mongolia due to not been experienced for private sector led economy previously. During the early stages of privatization in 1991–1994, the sudden and chaotic dismantling of the state procurement system and rushed application of a half-prepared program of voucher privatization almost led to a collapse of the manufacturing sector. But, having learned the bitter lessons, the Privatization

Guidelines for 2001–2004 were instituted as the major Government policy document guiding the intensification of privatization through the attraction of foreign investors in priority sectors of the national economy. The overall policy objective is to accelerate privatization and increase private-sector participation, thus boosting inward FDI and improving economic productivity (Mehmet Demirbag, Ekrem Tatoglu, and Adiya Oyungerel, 2005). As a result, GDP had risen to 1.2 billion and per capita GDP to $480 (World Bank, 2004) which was sufficient to evaluate the Mongolia above the ranks of the World's poorest countries and moreover more than 80 percent of value added in the Mongolia is produced in private sector (National Statistical Office of The Mongolia, 2016).

The government has intensified policies for the promotion of manufacturing industries, especially those based on the nation's abundant resources and the sector has undergone a significant structural change since 1990. Since August 1998, it has introduced the Program for Expansion of e to improve the capacity utilisation of enterprises and increase foreign exchange earnings (Oyunbadam Davaakhuu, 2013). The program set the following objectives: (i) to expand the export of mining and ecological products through the processing of mineral and agricultural raw materials; (ii) to seek new market access; (iii) to develop infrastructure to promote export-oriented manufacturing in rural regions; (iv) to create a suitable legal environment for promoting exporting activities; and (v) to establish international trade centres in selected cities and rural areas. In order to improve the capacity utilisation of enterprises, the government has provided technical assistance during the period 1998-2000 to restructure several privatised state-owned enterprises in the food, carpet, meat processing, sheepskin tanning and clothing industries, which are considered important for the national economy. Even the Government had a policy promoting the sector, the manufacturing sector dropped from 12% of GDP in 1995 to 5.6% in 2016 (see Table 2). Food manufacturing rose mainly due to growing domestic demand, while textile manufacturing expanded largely due to export opportunities under the Generalized System of Preferences (GSP) (Oyunbadam Davaakhuu, 2013). As mentioned in report paper of United Nations Industrial Development Organization (UNIDO) by Hai Nguyen Thanh(2006) the Mongolia business environment is "difficult for manufacturing investment due to its land-lock geography, small population of 2.6 million (half of which is nomadic), low purchasing

power, inadequate physical infrastructure, rugged land topography, as well as increasing competition from neighboring China and Russia".

Except privatization and promoting manufacturing sector, it has also implemented the 'Program for SME (Small and Medium Enterprises)', which aims to intensify the Mongolia's development through improving competitiveness, reducing informal businesses (by creating a favourable environment for engaging in formal activities) and creating employment opportunities since 2005. Essentially, small and medium enterprises definitions measured by firm size such as number of employees and annual turnover and which means firms differ in their levels of capitalization, sales and employment. In Mongolia, "Law of Small-Medium Enterprise" of the Mongolia (adopted in 27 June, 2007), as defined; a business is considered to be an SME if (Ganbold Solongo, 2017):

- Its number of employees are up to 9-19, annual sales turnover up to 50-250 million tugriks are small enterprises;
- Its number of employees are up to 49-199 and annual sales turnover up to 1.5 billion tugriks as defined by medium enterprises.

Government Decree No. 191 of 2014 had exempted manufacturing equipment and spare parts intended for small and medium industrial purposes from customs duties and value added taxes, but this has been removed in 2017 (Government Decree No. 168, 2017). The list of SME production equipment and spare parts from Customs and VAT exemption includes milk production factory, fruit processing factory, beverage factory, meat factory, sausage factory, vegetable canning factory, poultry farming and bee breeding, bread and bakery factory and 30 other types of industrial equipment. The SME sector in the Mongolia employs over 300,000 people which is around 30% of total employees and is accountable for approximately 40% of GDP, but contributes a mere 1.8% to the state budget in taxes (Togtokhbuyan Lkhagvasuren, Huo Xuexi, 2014). By 2016, there are 72182 enterprises operating actively in the country and out of those 84 percent run with employees' number of 1 – 9 (Fig.3).

Figure 2: Operating enterprises, by employment size group, %.
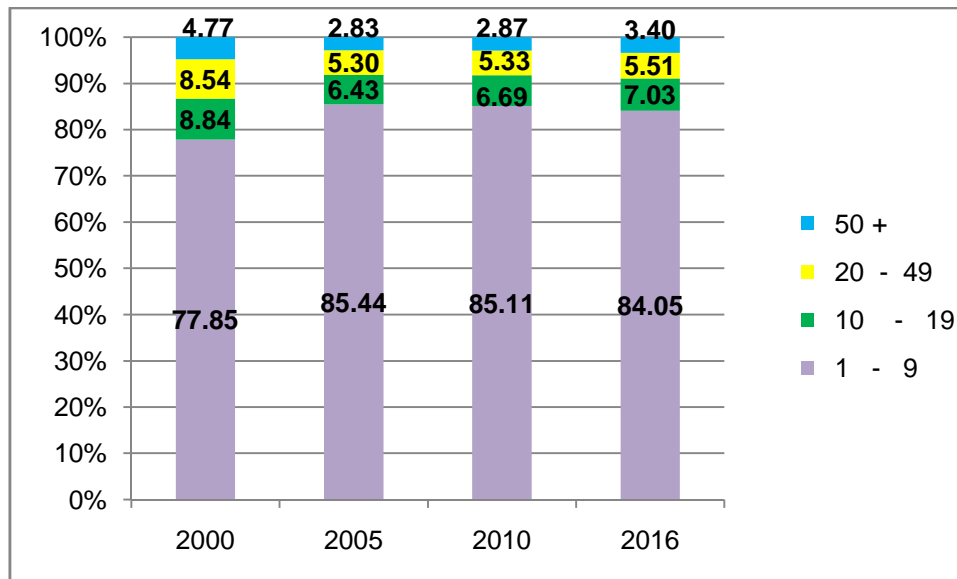
(Yearbooks 2010 and 2016, NSOM)

Therefore the Mongolian Government has been paying great attention to develop national innovation system and approved a plan, "Master plan for developing science and technology of The Mongolia, 2007-2020" by Government decree number 2 of 2007. Also the Mongolian parliament passed a strategy, "Comprehensive Strategy of National Development which is based on Millennium Development Goal of The Mongolia" by its Decree number 12 of 2008. These policies have declared that our country will build self-supporting economy by increasing its financial capabilities with mining industry development and the country will be shifted to knowledge based economy eventually.

Moreover, the Mongolian participation as a member of international organization has started joining United Nation in 1961. In 1997, the country joined the WTO for seeking to expand its participation in regional economic and trade regimes. In an attempt to integrate with the world's fastest growing regions, the Mongolia follows the activities of Association of South East Asian Nations and Asia-Pacific Economic Cooperation and maintains an observer status in these regional groups for instance, Shanghai Cooperation Organisation *(SCO).* The Mongolia is also negotiating a Transit Transport Framework Agreement with China and Russia to facilitate its exports and imports through their territories to third countries (it is a notion described the countries except the two neighbors of the country). The

Mongolia is establishing free trade and economic zones, as well as industrial and technological parks to increase its trade transactions and attract foreign investment. To establish free economic zones near the borders with its neighbours, the parliament enacted legislation including the Law on the Legal Status of the Altanbulag Free Trade Zone (in the northern part of The Mongolia) in 2002 and the Law on the Legal Status of the Zamiin-Uud Free Economic Zone (in the southern part of the country) in 2003. The establishment of free trade and economic zones near the Russian and Chinese borders has been launched with a view to increase exports. To try to create a favourable climate for private sector-led industrial development, the Mongolian Parliament enacted several new laws and made amendments to existing ones. In particular, Foreign Investment Law was enacted in 1993 to attract foreign investors and Partnership and Company Law was enacted in 1995 which imposes no restrictions on setting up an industry. To promote fair competition, a Law on Prohibiting Unfair Competition (LPUC) was enacted on 12 May 2000. To ensure the implementation of the LPUC, the Unfair Competition Supervisory and Regulating Authority (UCSRA) was established in 2004. In 2008, the UCSRA was restructured and re-named the Authority for Fair Competition and Consumer Rights Protection included an extension of the authority's role to protecting consumers' rights. Therefore the Mongolia has also signed an Economic Partnership Agreement (EPA) with Japan, which entered into effect in June 2016. In 2016, Mongolia and Canada signed a Foreign Investment Promotion and Protection Agreement (FIPA) which entered into force on March 7, 2017. In 2016, Mongolia and the Republic of Korea agreed to launch talks on a Free Trade Agreement in 2017 (U.S. Department of State, 2017).

As a result of all the efforts attained by Government of the Mongolia (GoM), the economy grew by 6.2 percent per annum from 1995 to 2016 after severe circumstance reduced from the mid - 1990s (for details in Table 1 and Fig. 2) reaching 5.5 and 17.3 percent in 2003 and 2011 respectively.

Figure 3: Tendency of Gross Domestic Product and its growth rate, 1985-2016.
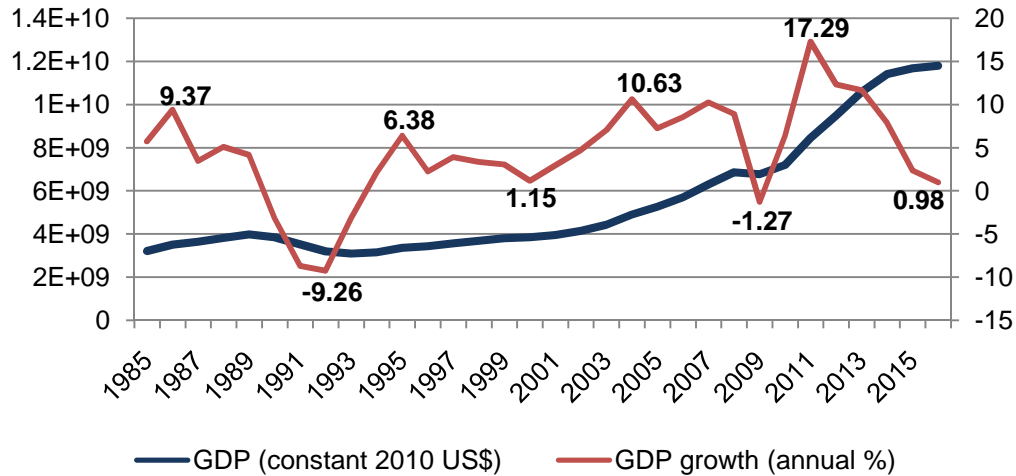
(World Development Indicators, World Bank)

Since 1990, growth of GDP in the Mongolia peaked in 2011 reaching 17% and reached the lowest point of -9 percent in 1992. Growth averaged nearly 9% per year in 2004-2008 largely because of high copper prices globally and new gold production but dwindled to -1.3 percent at 2009 (CIA, 2016). Because of its open economy which externalities can have an impact on it, by late 2008, the Mongolia was hit by the global financial. After the fall, there was a period for the Mongolia considered one of the fastest growing economies in the world due to its booming mining industry at the onset of the second millennium, leading it to become one of the top hotspots for investment. The success of the mining sector catapulted the Mongolia's previously almost non-existent GDP growth rate to a record 17.3% in 2011, but since then, growth has dropped to 8% in 2014 and 0.98 in 2016 (NSOM).

Figure 4: Sectors' decomposition of GDP, 1990-2016, by percent.
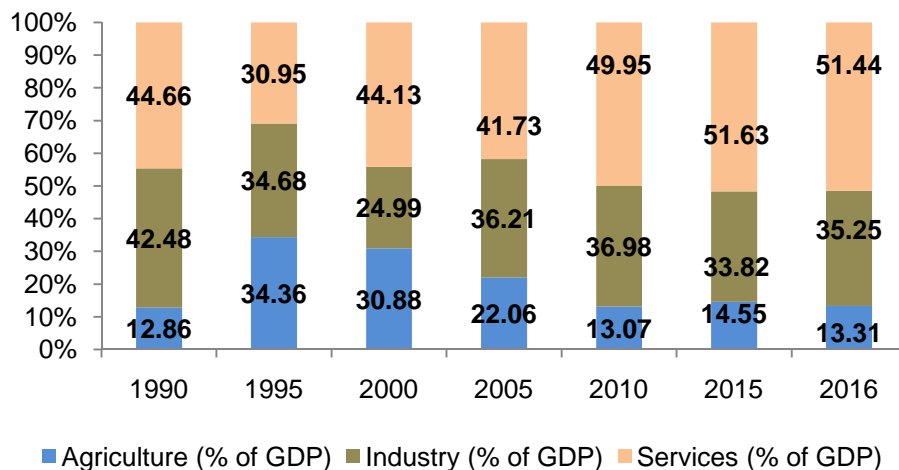
(World Development Indicators, World Bank)

Traditionally, the Mongolian economy depended primarily on agriculture, which during the 1990s accounted for nearly one-third of GDP, before declining perceptibly after 2000 (Fig. 3). Conversely, during this same period, and particularly after 2000, the tertiary sector (dominated by wholesale and retail trade as well as transport and communications) has been an engine of economic growth, now accounting for nearly more than half of GDP. The share of the secondary sector, which consists of manufacturing, mining, and construction, had fallen gradually from roughly 40 percent of total GDP in 1990, but has steadily stagnated around 35 percent after 2000.

It is evident that the Mongolia's economy is relevant to agriculture sector when one realizes the share of the sector's employment to total employment in the country.

Figure 5: Employment by classification of main economic activities, %.
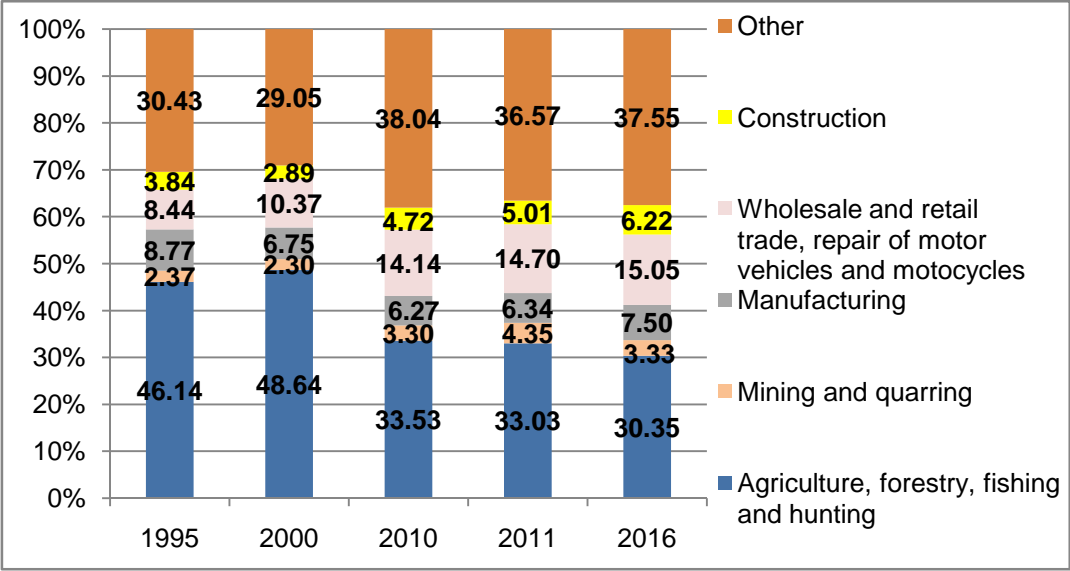
(Yearbooks 1990-2004, 2010 and 2016, NSOM)

Employees in agriculture sector has decreased for recent years compared to first decade of transition but still it has been contributing main role in the economy while mining, due to its capital intensity feature, employs only about 3-4 percent of the workforce. Contributions by the trade sector to employment have rose dramatically from 8 percent in 1995 to 15 percent in 2016 and the contribution of the manufacturing sector to employment fell from around 9 percent in 1995 to about 7.5 percent in 2016.

2.3 Foreign Direct Investment in the Mongolia

The amount of FDI inflow settled in the Mongolia stands for inconspicuous amount comparing to World and region's FDI inflows, but it accounts for 13 percent of GDP of the country by 2016. World FDI inflows decreased by 2 percent to $1.75 trillion, FDI flows to transition economies almost doubled, to $68 billion, following two years of steep decline – reflecting large privatization deals and increased investment in mining exploration activities (UNCTAD, 2017) and in the Mongolia, FDI inflows enlarged by 6.7 percent reporting US$ 1.4 billion (National Development Agency, 2017). By late 2016, the Mongolia's FDI inflow accounts for 0.08 percent to overall FDI inflows of the World and 2.2 percent to total FDI in transition countries (see Fig. 6).

Figure 6: Comparison of the Mongolia's FDI inflow to overall world and region's FDI inflow, 2017.
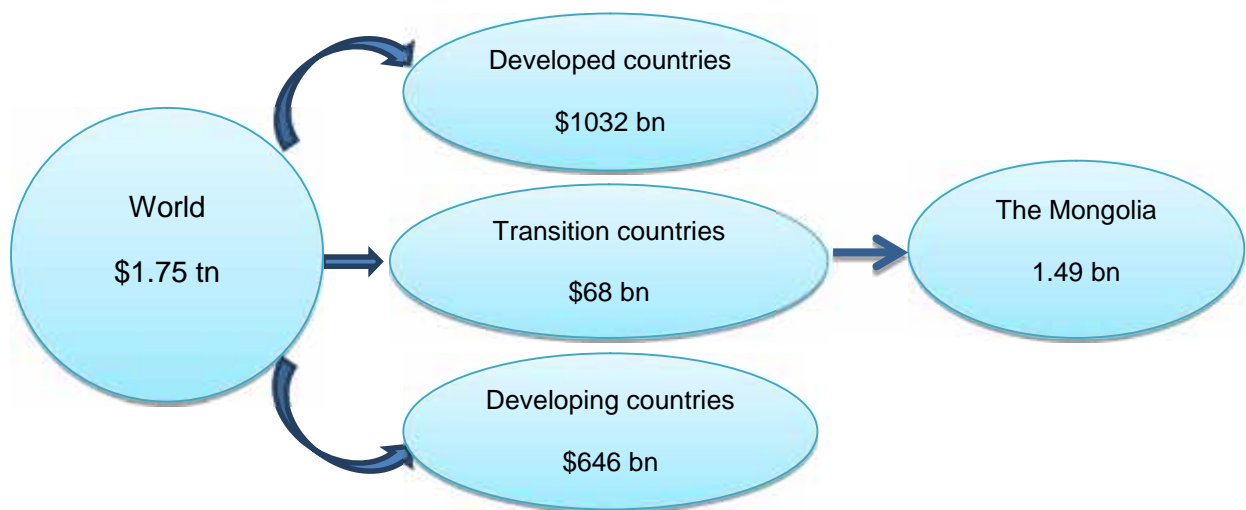
(UNCTAD report, 2017)

In the Mongolian transition process since the early 1990s, investment and trade liberalization have been pillars of the country's development strategy (UNCTAD, 2012). As a result, FDI which can play an important role in creating an "imported" private sector and strengthening the competitiveness of the economy accelerated gradually during the examining period of 1990-2016 and exhibited burst increase inearly of second decade of 21st century. Over the examined period (from 1990 to 2016) in this thesis, the overall stock of FDI to the Mongolia reached US$ 19.12 billion.

Figure 7: Annual FDI inflows to the Mongolia (thousand US$) and its annual growth rate,1990–2016.
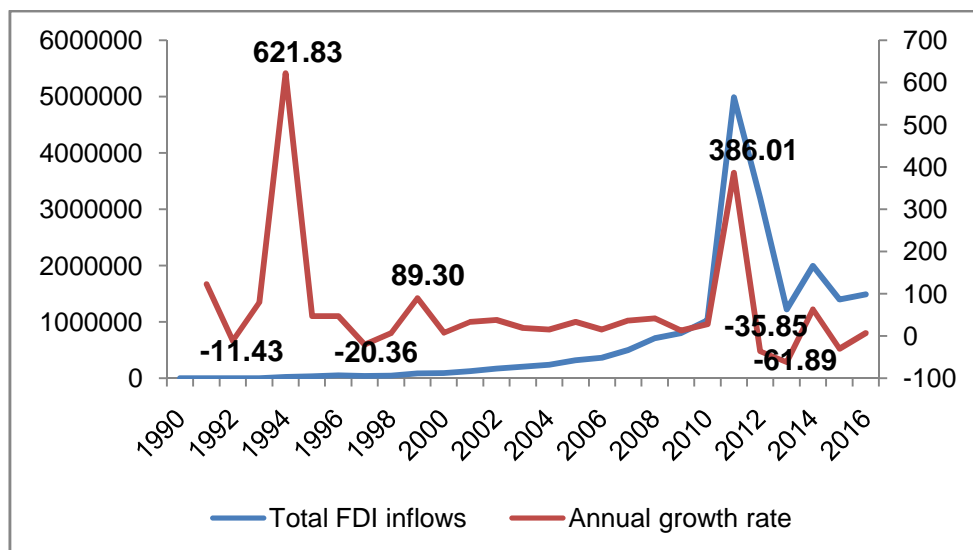
(National Development Agency (NDA)'s data source)

Flows of FDI into the Mongolia exhibited slow but steady growth from almost nothing in 1990 (US$ 965 thousand) to about US$ 54 million in 1996, and by 2003, cumulative FDI inflows had exceeded the US$ 1 billion equaling the country's nominal GDP. At the onset of 2010 large amounts of capital inflows were recorded when the Mongolia attracted USD 1.025 billion which escalated to US$ 4.99 billion in 2011 (approximately 280 % growth compared to previous year) and declined US$ 3.2 billion and 2012, of which approximately 80 percent was flowing to the mining sector. Furthermore, in 2013 FDI fell by 62 percent to US$ 1.22 billion and 2014 witnessed an increase by 63 percent to 1.99 billion. These performances had reflected the efforts of the Government of the Mongolia (GoM) to attract foreign investment and attractiveness of the endowments of the country's natural resources. In particular, it could be considered as a result of a policy of great privatization and the GoM's attempts to deepen the reform of the economic and institutional environment as it mentioned above.

The burst increase of FDI inflow to the Mongolia in 2011 expressing almost four times as much as in the previous year (48 percent of GDP) can be belonged to an increase in FDI in mining sector. Especially, the Mongolia passed long-awaited legislation on an investment agreement to develop the Oyu Tolgoi (OT) mine, among the world's largest untapped copper-gold deposits in October 2009. Even the

decrease starting from 2012 after the sharp jump was originated due to a "dispute with foreign investors developing OT which called into question the attractiveness of the Mongolia as a destination for foreign investment" (CIA, 2016). This caused a severe drop in FDI, and a slowing economy. Growth of FDI to the country declined by 35.8 percent in 2012 and it lasted for next year by 62 percent interpreting US$ 1.2 billion. The economy had grown more than 10% per year between 2011 and 2013 before slowing to 7.8% in 2014, and falling to the 2% and 0.98% level in 2015 and 2016 respectively. It is manifestation that FDI had a role amplifying economic growth in the Mongolia (Table 3).

Table 3: Nexus between FDI inflow and the value-added growth in the Mongolia, 1990-2016.

	Total FDI inflow (bn US$)	Share of FDI inflow in total amount to the period, %	Average growth of GDP during the period, %
1990-2004	1.12	5.86	1.55
2005-2009	2.69	14.09	6.74
2010-2012	9.21	48.17	11.99
2013-2016	6.10	31.88	5.72
1990-2016	**19.12**	**100**	**4.27**

(World Bank; NDA)

Within the period of 2010-2012, the Mongolia has experienced a massive increase in total stock of FDI attracting US$ 9.21 billion which contributed merely half of total FDI stock of the examining period, 1990-2016. Therefore the timeframe of the burst increase of FDI inflow to the country is coincided with its boom period of GDP growth which was around 12 percent per year. In the five-year period from 2009 to 2014 the Mongolian nominal gross domestic product (GDP) has tripled (Matej Šimalík, 2015), and it can be persuasively traced with FDI into the country.

With regard to the targets of the FDI, most of the FDI poured to primary sector, particularly – mining industry – the copper and coal mines. Smaller amounts of FDI inflow went to the service sector of the economy and the secondary sector including manufacturing were targeted only by a negligible share of the total FDI inflow (Fig.8).

Figure 8: Sectoral structure of FDI flows into the Mongolia by selected years, %.

	1991	1996	2001	2006	2011	2016
Tertiary	53.67	34.91	22.24	32.21	13.73	30.59
Secondary	16.91	52.18	16.49	1.36	0.21	3.56
Primary	29.41	8.91	48.50	53.40	81.90	60.98
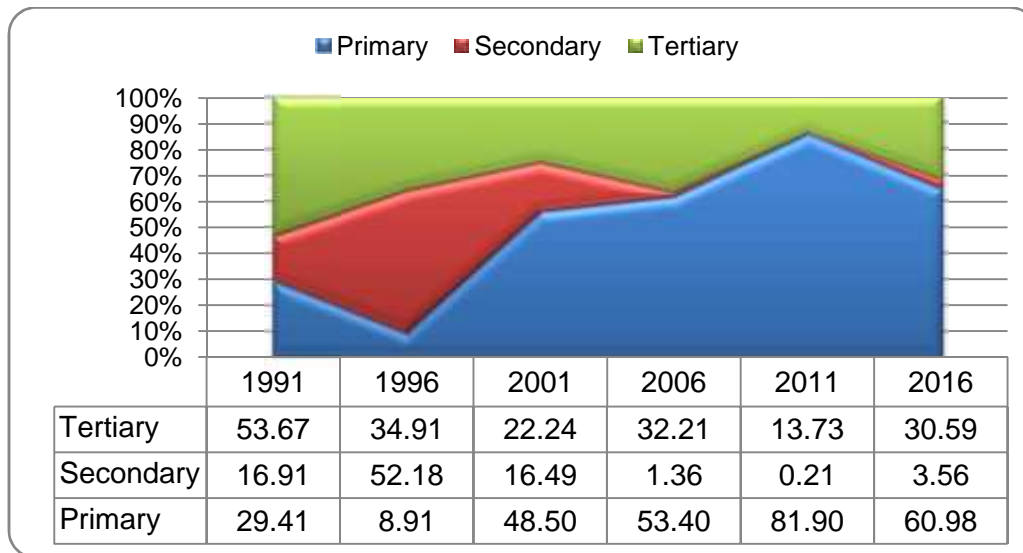
(National Development Agency of the Mongolia (NDA))

FDI in the Mongolia's extractive industries which are based on extensive deposits of copper, gold, coal, molybdenum, uranium, tin and tungsten has transformed the Mongolia from its traditional dependence on herding and agriculture. By 2016, about two thirds of FDI inflows was concentrated in the primary sector mostly in extractive mining, approximately one third of the amount accounted for service sector and only 3.6 paercent of total FDI inflow (US$ 53 million) was directed into manufacturing sector. As mentioned previously, it is not effective to the country's economy due to the argument that FDI generates externalities in the form of technology transfer, managerial know – how and the spillover of backward and forward linkages seems to be more relevant to investment in manufacturing sector than in the primary and service sector theoretically and empirically.

In Fig.9 shown below, structural change of FDI inflows for ten years difference is disaggregated by economic sector. Sectoral structure of FDI inflow in the Mongolia was not considerably changed during the ten years. The leading recipients of FDI have been mining, trade and catering services, banking and financial services, processing of animal products (for instance, cashmere as well as meat and poultry production), and light industry (including processing of the textile and garment industry). Within the primary sector, FDI in extractive industries including coal, oil and gas and metal mining, dominates more than half of total inflow to the country

expressing 53 percent in 2006 and 61 percent in 2016, while investment inflow in agriculture remains low.

Figure 9: Structural change of FDI inflows in the Mongolia, 2006-2016, %.

l prospecting, oil exploration &

, animal husbandry

try

of animal originated raw materials

of foods and beverages

ng construction and production of
materials
roduction

d gifts

liances manufacturing

production

ormation, Telecommunication

insportation

ide and catering services

urism

nk and financial services

er
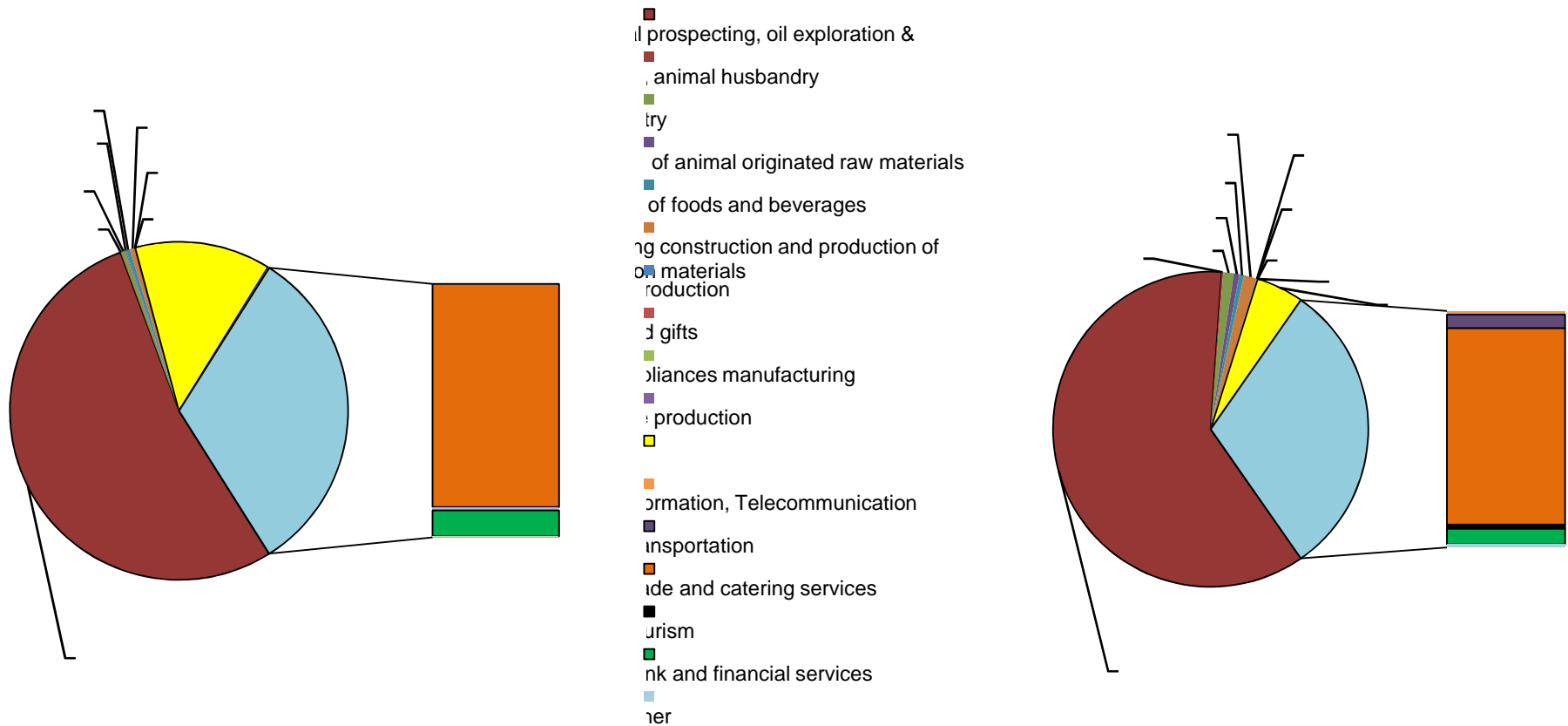
(National Development Agency of the Mongolia (NDA))

Within the manufacturing sector, four major industries, namely engineering construction and production of construction materials, production of food and beverages, light industry and processing of animal originated raw materials accounted for more than 90 percent (99% for 2006 and 96% for 2016) of all FDI stock in manufacturing activities which constituted only 1.36 percent (US$ 4.98 million); 3.56 percent (US$ 53 million) in 2006; 2016 respectively to total FDI inflow (fig.8 and 9).

Among the activities, the largest recipients of inward FDI flow were trade and catering services accounts for more than four fifths (88% in 2006 and 83% in 2016), bank and financial services accounts for 10 percent in 2006; 7 percent in 2016, transportation stands for less than 1 percent (0.02%) in 2006 to 6 percent in 2016 in overall inflow to the sector. With respect to the tourism segment which can be the main economic activity that diversify the Mongolia's economy, its contribution was only 0.45 percent to US$ 11.98 million in 2006 and the amount has declined to 0.54 percent (US$ 8 million) in 2016 to total FDI inflow.

Over the period 1990-2016, the mining sector attracted 68 percent (US$ 12.996 billion) of total stock of FDI into the Mongolia and therefore the sector has contributed biggest share which was 30; 21.8 and 20.5 percent in 2006; 2011 and 2016 respectively to the country's annual GDP (National Statistics Office of Mongolia, 2016). Specifically, 55 percent of whole FDI stock to the mining sector has reported only for three years, 2011-2013. The surge of FDI inflow for the years was mostly attributed to the closing of a deal related to the development of a copper mine in Oyu Tolgoi (OT) site by the Rio Tinto, a British-Australian mining TNC, and its affiliate Turquoise Hill Resources of Canada (formerly named Ivanhoe Mines). On October 6, 2009, Turquoise Hill Resources and Rio Tinto signed a long-term, comprehensive Investment Agreement with the Government of Mongolia for the construction and operation of the OT copper-gold mining complex. The agreement creates a partnership between the Mongolian Government - which acquired a 34% interest in the project - and Turquoise Hill Resources, which retained a controlling 66% interest in OT (Lazenby, Henry, 2013). The first major discoveries were made at OT in 2001. Estimates indicate that OT contains 2.7 million tonnes of recoverable copper and 1.7 million ounces (48,195,000 grams) of recoverable gold in reserves. The scale of deposits at OT is expected to allow the project to operate for over 50 years (Rio Tinto, 2013). It also contains 1.9 thousand tonnes of silver and 205 thousand tonnes of molybdenum. The OT mine attracted over $6 billion investment when it established in 2009 as a joint venture (Tserenpuntsag Batbold, 2015). The project stopped for some time due to the argument between participants and in May 2015 agreement with Rio Tinto to restart the OT mine and the subsequent $4.4 billion finance package signing in December 2015 (CIA, 2016). The importance of the Oyu Tolgoi development project lies not only in the sheer volume of the investment, but it is also important for the Mongolian economy due to it sparking interest to MNCs investing in

the country among other TNCs (Matej Šimal ík, 2015). Regarding to this, the Mongolia has attracted foreign capital as FDI from countries throughout the world. Fig.10 has shown the contribution of FDI based on country origin to the Mongolia.

Figure 10: Distribution of FDI inflows by country of origin, by percent.
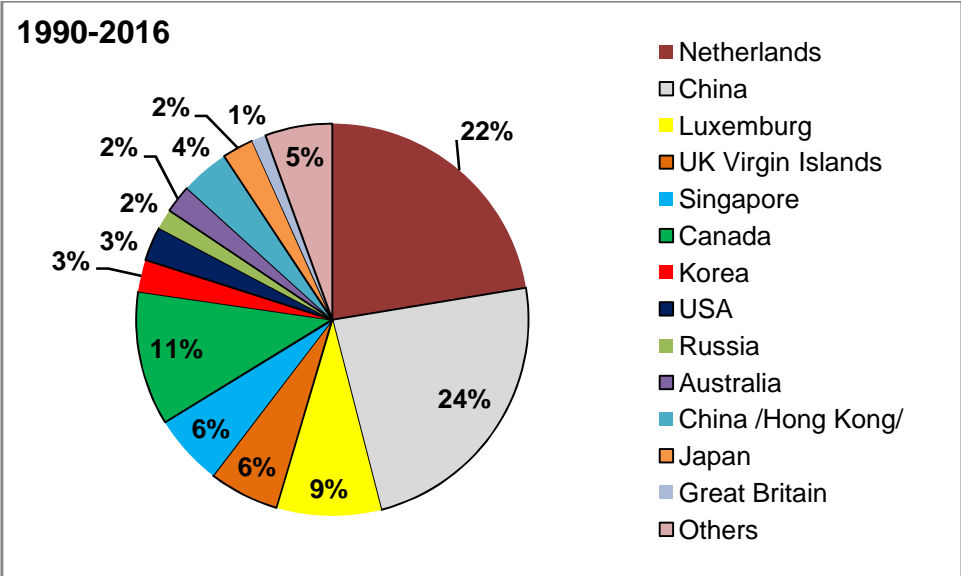
(National Development Agency of the Mongolia (NDA))

During the period 1990-2016, main investors were from those countries such as China, Netherlands, Luxemburg, Singapore, Canada, UK Virgin Islands, Korea, USA and Japan accounted for more than 80 percent of FDI stock of US$ 19.2 billion to the Mongolia. On an individual country basis, China is the leading investor accounting for 24 percent of total FDI stock over the time, followed by Netherlands (22%), Canada (11%), Luxemburg (9%), UK Virgin Islands (6%), Singapore (6%), the USA (3%) and Korea (3%) (Fig.6). World Bank dataset also indicates that China is the leading investor in terms of FDI company formation and Chinese investments were mainly concentrated in mining/exploration, trade and public catering, services, construction, and light industrial sectors (Mehmet Demirbag et.al, 2005).

Besides attracting investor's interest, the mining industry has taken dominant share in the overall the Mongolia's export.

Figure 11: Composition of export by main commodity group, 2007-2016, %.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
■ Others	18.3	29.5	21	9.2	5	4.9	10.9	10.8	14.1	22.4
■ Textiles and textile articles	13.5	8.9	10.2	7.4	5	5.3	6.6	5.9	6.5	6.1
■ Mineral products	66.8	60.3	66.4	81	89.2	89.2	81.9	83	78.8	70.9
■ Livestock, animals origin products	1.4	1.3	2.4	2.4	0.8	0.6	0.6	0.3	0.6	0.6
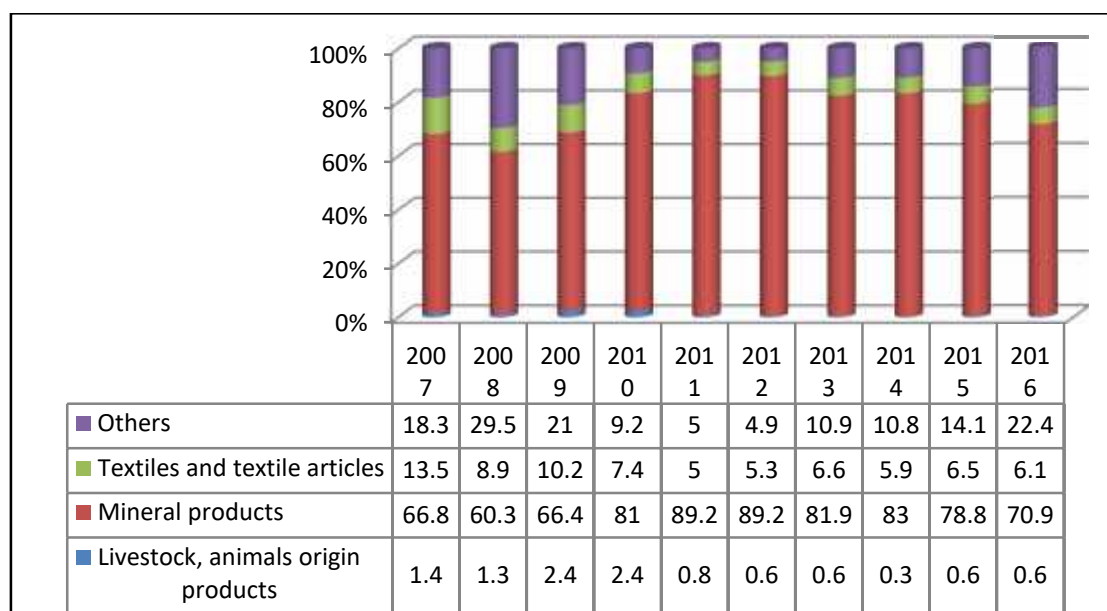
(Yearbook 2016, NSOM)

Within the timeframe taken, the share of mineral products' export (including coal, crude petroleum oil, copper concentrates, molybdenium etc…) accounted for over three fifths to total volume of the country's export. In 2011, the year of burst increase of FDI inflow to the Mongolia, the overall exports had increased by the 220 percent in comparison with the amount in 2007, while the volume of mineral exports increased by 330 percent in the same period. This notable increase in export of mineral products can be said that it has been largely influenced by the rise of FDI inflow into the mining sector of the economy over the period. Looking at the other commodities' exports which since 2000 the GoM's policies has taken significant attention for promoting manufacturing industries based especially those on the nation's abundant resources did not fare well. As mentioned above the Program for Expansion of Export-oriented Manufacturing introduced in 1998 was promoting productions such as (i) processing of copper and gold, (ii) meat processing, (iii) leather processing, (iv) cashmere and (v) wool processing and carpet. But the other commodities' export, for example, livestock, animal - origin product accounts for a negligible amount (see Fig.7). Share of textile products export is quite high in comparison of other non-mineral products' export reporting 6 percent in 2016. As Oyunbadam Davaakhuu (2013) considered textile manufacturing expanded largely due to export opportunities under the Generalized System of Preferences (GSP). The rising exports have translated to the rising government revenue, which means that over time the

government of the Mongolia could propose more robust budgets and spend more money on further development of the country (Matej Šimal ík, 2015).

2.3.1 Institutional environment of FDI in the Mongolia

As mentioned above the priority goal of the Mongolian authorities is to establish a private sector–led, export-oriented economy that could support rapid economic growth. Realizing FDI as an important source for the Mongolia's economic development, the Government of the Mongolia (GoM) has initiated various incentives and liberal policies to promote foreign investments in the country. These include the enactment a Law on Foreign Investment issued in 1991 as a first concrete step towards FDI encouragement and the establishment of the National Development Agency (NDA) which was named Board of Foreign Investment (BFI) established in August 1996 by the GoM. Given rapid development and changes in the economic environment, the Law was subsequently amended in 1993, 2001, 2002 and 2008 to further liberalize provisions for foreign ownership, particularly in the mining sector, by abolishing restrictions on profit remittances, granting exemptions from customs duties and sales taxes, and providing opportunities for limited tax holidays (FIFTA, 2002) and most recently replaced by a new law on investment governing both domestic and foreign investment. In particular, a law named Regulation of Foreign Investment in Business Entities Operating in Sectors of Strategic Importance ("SSI Regulation") was put in place in May 2012 to regulate the booming-mining sector. As JavkhlanbaatarSereeter (2013) considered, in 2013 both the Law on Foreign Investment and SSI regulation was incorporated and created the Investment Law of the Mongolia which aimed to improve the investment climate in the Mongolia giving same importance to domestic and foreign investors. BFI had two major responsibilities that were development of foreign investment projects and the promotion of foreign direct investment. In July 1998, the BFI was attached to the Ministry of External Relations and the name of the organization changed to Foreign Investment and Foreign Trade Agency (FIFTA). In September 2000, the FIFTA started operating under the authority of the Ministry of Industry and Trade. FIFTA was the government agency responsible for the promotion and facilitation of FDI and foreign trade in the country. For its purpose FIFTA established the Mongolian Investment Promotion Center to provide a full range of services, including the

promotion of the investments overall, supplying information on the legal and business climate, assistance in forging partnerships, provision of consultancy services, and support in project implementation (FIFTA, 2002). The authority was renamed National Development Agency in late 2016 and from then on, NDA has been the primary government agency responsible for the foreign investment into the manufacturing sector (MIDA, 1996: 45).

The Investment Law frames the general statutory and regulatory environment for all investors (foreign and domestic) in Mongolia. Under the law, foreign investors can access the same investment opportunities as Mongolian citizens and receive the same protections as domestic investors. The law also provides for a more stable tax environment and provides tax and other incentives for investors. Accordingly, most investments by private foreign individuals or firms residing in Mongolia need only be registered with the General Authority for Intellectual Property and State Registration (GAIPSR).

The Investment Law offers tax incentives in the form of transferrable tax stabilization certificates which give qualifying projects favorable tax treatment for up to 27 years. Affected taxes may include the corporate income tax, customs duties, value-added tax, and mineral resource royalties. The criteria for participation in the tax stabilization program are transparent and include the amount of investment, the sector involved and the geographic area involved. It also provides non-tax incentives including:

- No import duty for machines and equipment of manufacturing, processing and industrial facilities
- Employee training costs are deducted from taxable income
- Investors are served through simplified registration and immigration procedures
- Land lease by foreign investors from 40 to 60 years to development projects
- Simplified procedures for permanent residence permit and multiple entry visa for investors.

According to Investment Law, imported machineries and technical equipment can be exempted from customs duty, VAT rate can be zero rated during the construction works in following cases:

- To build construction materials, oil and agricultural processing and export product plants;

- To build plants to use nano, bio and innovation technology;

- To build power plant and railway.

Regarding the overreliance on the volatile mining sector, the country need to diversify its economy with the agricultural and livestock sectors based on the country's resource. Investment in agriculture sector offers following exemptions and tax credits which include:

- According to Corporate Income Tax, income generated from production and planting of the following products only shall be subject to 50% tax credit: grain, potato, vegetable; milk; fruits and berries; soiling crop.

- According to February 2017 amendments in Corporate Income Tax, taxpayer operating in the following sectors with annual taxable income not more than MNT 1.5 billion, only the income from activities of the following areas of operation will enjoy 90% tax discount:

  - Crop and livestock production, related support activities;

  - Food production;

  - Textile and clothing industry;

  - Manufacturing of construction materials.

Mongolia is not part of any regional economic block, but often seeks to adapt and adopt European standards and norms in areas such as construction materials, food, and environmental regulations, and looks to U.S. standards for activity in the petroleum sector, while adopting a combination of Australian and Canadian standards and norms in the mining sector (U.S. Department of State, 2017). Since 2005 Mongolia has been part of GSP+, a program aimed to support developing countries that export to EU markets. The program which eases tariffs for imported products when entering EU markets includes total of 7200 types of goods and products for tariff concession. For Mongolia, GSP + regulation highly benefits cashmere and cashmere products. For instance, while normal tariff in EU for knit textile and garment accessories is 12%, and 6.5% for processed horse and cattle

leather, these products will be exported without tariffs by accessing the system. In addition, live animals, meat, meat products, dairy products, vegetables, and fruits are exempted from tariffs (NDA, 2016).

Therefore the GoM has been taking some measures to create a favorable foreign environment for foreign investors. To-date the Mongolia has signed "Investment protection and promotion agreement" (although six of the signed are not yet in force) and "Agreement on Avoidance of Double Taxation" with 26 countries around the World. The Mongolia has joined the "Washington convention on settlement of disputes" and has also been a full member of the Multilateral Investment Guarantee Agency (MIGA) of the World Bank group since January 1999; investors can thus be eligible for risk insurance through MIGA. The Mongolia became a member of the World Trade Organization (WTO) in 1997. Therefore the Mongolia has also signed an Economic Partnership Agreement (EPA) with Japan, which entered into effect in June 2016. In 2016, Mongolia and Canada signed a Foreign Investment Promotion and Protection Agreement (FIPA) which entered into force on March 7, 2017. In 2016, Mongolia and the Republic of Korea agreed to launch talks on a Free Trade Agreement in 2017. In January 2017, the two countries certified completion of their respective applicable legal requirements and procedures for the U.S. – Mongolia Agreement on Transparency in Matters Related to International Trade and Investment, or Transparency Agreement, which came into effect on March 20, 2017. It sets out clear processes for drafting and commenting on new legislation and regulations and requires strict transparency related to laws involving trade and investment (U.S. Department of State, 2017).

3. CHAPTER DATA AND METHODOLOGY

Over the examining period of 1990 – 2016, general view has been seen that FDI in the Mongolia has become increasingly important part of the country's economy to boost it. In this chapter, the relationship between growth rate of economy and FDI in case of the Mongolia will be examined by using the Eviews – 8 version.

3.1 Data

The data for analyzing growth effect of FDI in the Mongolia covers the period 1990-2016. This period has witnessed the fact of the transition period from centrally planned economy to free-market economic system and encompassed some economic issues including severe decline of its economy in early of 1990s and world financial crisis started in 2008-2009. Since the phenomenon of economic growth is not only affected by a single variable, it is a combination of certain economic factors, the effect of FDI in the Mongolia must to be explained in depth investigation by taking main factors of the economy into the account simultaneously. Alongside FDI as the core independent variable, other variables are inflation, trade openness and government spending and the dependent variable is taken by the growth rate of real GDP. Data for all variables are given yearly. Economic growth data was taken from World Bank Development Indicators (WB-DI), which is one of the benchmark information of economies around the world, and interprets the evolution of real GDP (constant US$ 2010). Foreign Direct Investment (FDI) inflow data was obtained from two sources that are National Development Agency (NDA) and the data Oyunbadam Davaakhuu (2013) used in her paper. Inflation as measured by the consumer price index represents the annual percentage change in the cost to the average consumer

of acquiring a basket of goods and services. Trade openness (dependence) ratio is defined as the value of total trade (imports plus exports) as a percentage of GDP (UNESCAP, 2009). Government spending is the consumption, transfer and expenditures made by government given at local currency tugrik. All data for these three variables are taken from Yearbooks reported by National Statistics Organization of the Mongolia (NSOM).

3.2 Methodology

As a methodology to test relationship among the variables is Vector Error Correction Model (VECM). For doing it, the requirements which VECM consequences should be robust, normality test, multi-collinearity test and heteroskedasticity test was estimated. Before estimating VECM, the Unit root test is assessed for stationarity, some criteria is tested for choosing lag orderand Johansen cointegration test is evaluated for long run relationship.By theVECM, long- and short-runcausal relation will be estimatedbetween variables (growth rate of GDP as a dependent variable and FDI, government spending, trade openness and inflation as regressors). Time-series data for 27 years is used to the analysis for the Mongolian case.

The impact of overall FDI inflows on economic growth will be estimated by the following multi-variables model:

$$G \quad h_t = \beta_0 + \beta_1 * F \quad _t + \beta_2 * C \quad _t + u_t$$

where, growth stands for real GDP growth rate, FDI describes Foreign direct investment inflows in thousand US\$ to the Mongolia, u_t represents error terms and controls include inflation rate by percentage, trade openness by percentage and government spending by million tugrik (the Mongolian local currency).

For answering the assumptions 2-4 setting up different impact of FDI by sector on economic growth, following expression will be used:

$$G \quad h_t \leftarrow F \quad _t^j$$

where, j corresponds to the primary, manufacturing and service sectors respectively and control variable embodies same variables as first equation.

For the model 1, the expected initial result is to be an impact from main independent variable, FDI, to the dependent variable, growth rate of GDP for overalland for model 2the expectations are to have a causal relation from FDI in manufacturing sector to growth rate of the economy, no causal relation to the economic from FDI in primary sector and un certain for the FDI in service sector.

3.2.1 Unit root test

Knowing the order of integration is important for setting up an econometric model and also economic theory suggests that certain variables should be integrated in time series data. Due to the two issues, a unit root test, also known as a difference stationary process, is basically accounted for representing stochastic trend in a time series data. If a time series data has a unit root, it means that there is a systematic pattern which is unpredictable. Moreover, the existence of unit roots leads non-standard distributions and causes the regression analysis to be spurious. In this thesis, following Bo Sjo (2008) Augmented Dickey Fuller (ADF) test is applied for evaluating stationarity in the data. The Dickey Fuller test assumes that x_t is random walk process, $x_t = x_{t-1} + \varepsilon_t$, then the regression model becomes $x_t = \rho x_{t-1} + \varepsilon_t$. From both sides of the equation, subtract x_{t-1},

$$\Delta x_t = \pi x_{t-1} + \varepsilon_t, \qquad \text{where, } \pi = (1 - \rho).$$

If x_t is a stationary variable, $\hat{\pi}$ would asymptotically follow a normal distribution and standard tests would be possible. It can be represented that if x_t is a random walk, that the distribution of $\hat{\pi}$ is skewed under the null. The null hypothesis simulated by Dickey and Fuller is that x_t is a random walk, $H_0: \hat{\pi} = 0$. In ADF test, estimated model is $\Delta x_t = \alpha + \pi x_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta x_{t-i} + \varepsilon_t$ and the Null hypothesis is that $x_t = x_{t-1} + \varepsilon_t$ where $\varepsilon_t \sim N \quad (0, \sigma^2)$. Under the nul $\hat{\pi}$ will be negatively biased in a limited sample, thus only a one sided test is necessary for determining $H_0: \pi = 0$ $(x_t \sim I(1))$against $H_1: \pi < 0$ $(x_t \sim I(0))$.

3.2.2 Granger Causality test

Granger Causality is a way to estimate causality between two variables in time series. But it does not mean to show exact cause – and – effect relationship, it

investigates if a particular variable comes before another in the time series. Granger test is used for predictive causality. The original definition of Granger causality does not capture instantaneous and non-linear relationship. Duplicating David I. Stern (2011), the following equations are used for estimating the test:

- to see if x(t) Granger causes y(t):

$$y_t = \beta_{1,0} + \sum_{i=1}^{p} \beta_{1,i} y_{t-i} + \sum_{j=1}^{p} \beta_{1,p+j} x_{t-j} + \varepsilon_{1t}$$

- to see if y(t) Granger causes x(t):

$$x_t = \beta_{2,0} + \sum_{i=1}^{p} \beta_{2,i} x_{t-i} + \sum_{j=1}^{p} \beta_{2,p+j} y_{t-j} + \varepsilon_{2t}$$

where, p is the number of lags that adequately models the dynamic structure so that the coefficients of further lags of variables are not statistically significant and the error terms ε are white noise. The error terms may, however, be correlated across equations. If the p parameters $\beta_{1,p+j}$ are jointly significant then the null that x does not Granger cause y can be rejected. Similarly, if the p parameters $\beta_{2,p+j}$ are jointly significant then the null that y does not Granger cause x can be rejected.

3.2.3 Cointegration analysis

When the variables are not stationary at level but stationary at first difference or higher than I(1), ARDL bounds testing approach is consumed to determine the long-run equilibrium relationship between the estimating variables, which examines the following dynamic unrestricted Error correction model employing Ordinary least squares (OLS), by accepting each variables as dependent variable. For the basis of estimation technique, Maralgua Och et.al, (2017) is consulted.

$$\Delta Y_t = \alpha_0 + \alpha_t T + \sum_{n=1}^{a} \delta_n \Delta Y_{t-n} + \sum_{i=0}^{b} \delta_i \Delta X_{t-i} + \beta_1 Y_{t-1} + \beta_2 X_{t-1} + e_t$$

where, depicts the first difference operator, α_0 is the drift component in the equation, T is time trend, Y_t is dependent variable, X_t is a vector of determinants of

Y_t, δs are the short-run coeffecients, βs are the long-run multipliers and e_t shows error terms that are assumed to be independent and identically distributed.

The existence of long-run equalibrium relationship between growth rate of GDP and independent variables, FDI, inflation, government spending and trade openness, can be tested trough a joint F-statistic with the null hypothesis of no cointegration which is defined $H_0: \beta = 0$ ($\beta_1 = 0, \beta_2 = 0, ..., \beta_t = 0$) and with alternative hypothesis of $H_1: \beta \neq 0$ ($\beta_1 \neq 0, \beta_2 \neq 0, ..., \beta_t \neq 0$) . The F statistics exceed upper bounds of the critical value, then null hypothesis will be rejected. Otherwise, the result will be there is no long-run relationship among the examining variables. The test boubd approach is taken due to several issues consisting of its simplicity and elegance in calculating the short-run and long-run connections simultaneously whithin a single model, performance superiority when small number of observations are consumed in a study, its ability of assessing the models consisting of variables that are not stationary at level etc.

4. CHAPTER EMPIRICAL ANALYSIS AND RESULTS

Vector Error Correction Model (VECM) is used as a method for investigating the relationship among variables, particularly growth rate of GDP and FDI. The properties of variables are diagnosed for stationarity or order of integration employing Augmented Dickey Fuller (ADF) unit root test and Johansen cointegration test for deriving whether there is long run assosiation among the variables. For making sure of the VECM results, tests for residuals are taken into the estimation. Therefore, the Granger Causality test is utilizedfor determining causal relation among the sectoral FDI and growth rate of GDP of the Mongolia.

4.1 Analysis for Model 1

Model 1 attends to describe the overall impact of FDI on GDP growth of the Mongolia and the procedure of assessing the model is to evaluate the data at first and eventually to apply the appropriate technique for analysis of the time series.

4.1.1 Unit root test and Lag selection criteria

As mentioned above, for assessing time series data has to be stationary. Table 4 represents stationarity results using ADF test for GDP growth rate (GDPGR), foreign direct investment (FDI), inflation, trade openness as share of total foreign trade to GDP (TRADE) and government expenditure (denoted by GOVC) which are the variables chosen for estimating the regression model. One more variable is taken into account due to the fact that FDI series by its absolute amount is not stationary at I(1) and (I(2)) which cannot fit on account for cointegration test, Granger test and VECM. Despite using absolute FDI amount, share of FDI to GDP is employed as proximity of effect of FDI on GDP growth rate since the variable is stationary at I(1).

Table 4: ADF test at level.

Variables	Intercept		Trend and Intercept		None	
	t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
GDPGR (%)	-2.167635	0.2220	-3.160728	0.1149	-1.609885	0.0999
FDI (US$)	3.642223	1.0000	3.439442	1.0000	3.922424	0.9998
FDI (share of GDP)	-2.269277	0.1887	-3.264493	0.0945	-1.743411	0.0771
INFLATION (%)	-2.583156	0.1096	-3.313890	0.00870	-2.357955	0.0205
TRADE (share of GDP)	-6.387587	0.0000	-1.565034	0.7766	-0.426540	0.5193
GOVC (million TUG, in local currency)	-2.425580	0.1448	-2.425868	0.3588	-2.220288	0.0280

*MacKinnon (1996) one-sided p-values.

As a result of ADF test all series are non-stationary at their level which gives an idea that variables are not integrated at I(0). The techniques that must be used for estimating relationship among the variables here require that data must be stationary and even at same level. Thus, series should be tested for first difference.

Table 5: ADF test at first difference.

Variables	Intercept		Trend and Intercept		None	
	t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
GDPGR	-4.724572	0.0010*	-5.209880	0.0017*	-4.749062	0.0000*
FDI (US$)	2.717708	1.000	1.576214	0.9999	3.213366	0.9990
FDI (share of GDP, %)	-5.833954	0.0001*	-3.651484	0.0494*	-5.945272	0.0000*
INFLATION	-11.20986	0.0000*	-3.552437	0.0594	-5.024822	0.0000*
TRADE (share of GDP, %)	-14.80676	0.0000*	-5.103846	0.0021*	-15.13267	0.0000*
GOVC (million in local currency)	-5.762046	0.0001*	-5.667696	0.0006*	-5.885967	0.0000*

Series stationarity tested at first difference isrepresented in Table 5 andgrowth rate of GDP, share of FDI to GDP, government expenditures and trade openness series are stationary at I(1) and absolute amount of FDI and inflation rate are nonstationary at their first differences according to ADF test. Moreover, series of GDP growth rate, FDI (share of GDP) and government expenditure will be applied to compute VECM, but series of inflation rate and absolute FDI due to nonstationary problem and series of trade due to problem of insufficient observation will not be employed to the computation.

Another test forced for analysing long run relation and VECM is to choose how many lag must be employed in the model. For doing it, few criteria is used such as LR, FPE, AIC, SC, etc given by VAR lag order selection criteria and results denoted by the * sign which expresses lag order selected by those creteria as shown in Table 6.

Table 6: Lag selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-447.8492	NA	2.13e+13	39.20428	39.35239	39.24153
1	-416.6242	51.58914	3.12e+12	37.27167	37.86410	37.42067
2	-406.0770	14.67431	2.86e+12	37.13713	38.17389	37.39788
3	-387.4624	21.04260	1.41e+12	36.30108	37.78216	36.67357
4	-359.9286	23.94249*	3.67e+11*	34.68944*	36.61484*	35.17367*

* indicates lag order selected by the criterion

As a result, the optimum lag 4 will be utilized in the Johansen cointegration tests and VECM estimation.

4.1.2 Johansen cointegration test

Johansen Cointegration test is served for analyzing time series data and identify long term relationships between sets of the variables. For the data examined in this thesis (GDP growth rate as a dependent variable and FDI and government expenditure as independent variables) are I(1) and have optimum lag 4 as results from above. Johansen cointegration test using 4 lags is interpreted below, Table 7.

Table 7: Johansen cointegration test result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.898112	67.86355	29.79707	0.0000
At most 1 *	0.486355	17.61823	15.49471	0.0236
At most 2	0.125940	2.961348	3.841466	0.0853

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.898112	50.24531	21.13162	0.0000
At most 1 *	0.486355	14.65689	14.26460	0.0433
At most 2	0.125940	2.961348	3.841466	0.0853

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

Results has been shown properly that the variables moves together for long pattern since Trace statictic is more than the critical value and even the p value of 0.0000 is less than 0.05 indicating that there is long run relationship between GDP growth rate, FDI, goverment expenditure and trade. Moreover, the null hypothesis given that the variables are not cointegrated is rejected. It is also confined by other test named Maximum Eigenvalue.

So far, the variables are stationary at first difference and also moving together over time, it must be optimum option to use Vector Error Correction Model (VECM) for estimating variables.

4.1.3 Vector Error Correction Model results

The conditions that VECM can be used for assessing data are all series must be stationary at same order and the variables must have long run co-movement. The Jahonsen cointegration and ADF tests has already proposed the appropriate results which are long-run cointegration and I(1).

Table 8: VECM estimates.

Dependent Variable: D(GDPGR)

	Coefficient	Std. Error	t-Statistic	Prob.
C_1	-2.072073	0.480134	-4.315613	0.0026
DGDPGR(-1)	0.434775	0.275620	1.577445	0.1533
DGDPGR(-2)	0.683689	0.244191	2.799812	0.0232
DGDPGR(-3)	0.370470	0.238574	1.552854	0.1591
DGDPGR(-4)	-0.006667	0.203317	-0.032793	0.9746
DFDI(-1)	-2983.574	541.9308	-5.505451	0.0006
DFDI(-2)	-2222.461	394.8526	-5.628585	0.0005
DFDI(-3)	149.4253	138.0995	1.082012	0.3108
DFDI(-4)	1274.047	272.6614	4.672633	0.0016
DGOVC(-1)	3.75E-07	1.01E-07	3.712630	0.0059

DGOVC(-2)	4.13E-07	9.74E-08	4.237525	0.0028
DGOVC(-3)	5.17E-07	9.06E-08	5.702551	0.0005
DGOVC(-4)	3.64E-07	7.00E-08	5.202850	0.0008
C(14)	0.170277	0.590927	0.288153	0.7806

R-squared	0.922080	Mean dependent var	-0.052273
Adjusted R-squared	0.795459	S.E. of regression	2.063919
F-statistic	7.282230	Durbin-Watson stat	2.058514
Prob(F-statistic)	0.004254		

(Result is computed by using EViews 8)

According to coefficient of the cointegrating model(also known as error correction term),C_1, which is indicating negative in sign and significant (p value of 0.0026), there is a long-run causality running from regressors such as FDI and government spending to the dependent variable which is growth rate of GDP. The model is fitted well with determination coefficient of 0.922 depicting that 92.2 percent of the flactuation in the percentage change of GDP growth rate is affected by the flactuations in independent variables (share of FDI to GDP, government expenditure and their lags) in the Mongolia.Therefore, the adjusted R^2 of 0.7955 or almost 80 percent suggested that the independent variables are robust in describing the variation in GDP growth rate, thereby it represents a good fit. Likewise, the F-Statistics of 7.28 with probability of 0.004 indicates that the model is significant at 1% level and is a good fit expressing the implication that the estimates and inferences drawn are reliable. For concerning the Durbin Watson statistic of 2.06, there is an absence of first order serial correlation in the model. Also, the results derived represents that the lags of both independent variables are statistically significant in explaining the variations of GDP growth rate.

Furthermore, revealing whether there is a short run causal relation between the variables, the Walt test is utilized.

Table 9: Wald test result.

Wald Test for FDI to GDPGR:

Test Statistic	Value	Df	Probability
F-statistic	10.57574	(4, 8)	0.0028
Chi-square	42.30296	4	0.0000

Null Hypothesis: C(6)=C(7)=C(8)=C(9)=0

Wald Test for GOVC to GDPGR:

Test Statistic	Value	Df	Probability
F-statistic	14.77341	(4, 8)	0.0009
Chi-square	59.09363	4	0.0000

Null Hypothesis: C(10)=C(11)=C(12)=C(13)=0

In the test, null hypothesis is given that C(6)=C(7)=C(8)=C(9)=0 demonstrating 4 lags of FDI share to GDP has no short-run causal impact and C(10)=C(11)=C(12)=C(13)=0displaying 4 lags of Government spending has no causal effect to Growth rate of GDP. As the Wald test results these hypothesis are rejected by Chi-squere probability of 0.0000 for both and two results have arised indicating that there are short run causal relations running from FDI (share of FDI to GDP)(I) and Government spending (II) to growth rate of GDP.

4.1.3.1 Tests for Residual

According to Table 9 illustrating test results of autocorrelation, heteroskedasticity and normality, the LM-test statistics with Chi-square probability of 0.8436 which is more than 0.05 rejecting the null hypothesis of presence of serial-correlation and Breusch-Pagan-Godfrey test with Chi-square of 0.5718 representing the absence heteroskedasticity in the model. Likewise, the result of Jarque-Bera normality test with a probability of 0.883 (See detail from appendix) expresses a confirmation of the Null hypothesis that residuals are distributed normally. P values for the test are greater than the critical value at 5% level of significance representing reliability of the model.

Table 10: Serial correlation, Heteroskedasticity and Normality test results.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.047112	Prob. F(2,6)	0.9543
Obs*R-squared	0.340148	Prob. Chi-Square(2)	0.8436

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.622758	Prob. F(15,6)	0.7867
Obs*R-squared	13.39582	Prob. Chi-Square(15)	0.5718

Scaled explained			
SS	1.701813	Prob. Chi-Square(15)	1.0000

(Result is computed by using EViews 8)

To conclude, theoretically and empirically acceptable results has been achieved for the Model 1 which strives to find relation between GDP growth rate and FDI. In the aggragate level, FDI is observed to have bothshort-run as result of Wald test and long-run as result of Error correction term (W_1) impact on economic growth in the Mongolian case. For other independent variable, Government expenture, the same result as FDI has been observed. And the model built by VECM is fitted well and reliable according to R^2, F-statistic and Residual diagnosis.

4.2 Analysis for Model 2

Only Granger causality test is dealt with analysing the Model 2 which assesses sectoral effect of FDI on growth rate. Thus, at first, the processes of evaluating stationarity which is suitable for employing in the test must be represented.

Table 11: ADF test at level.

Variables	Intercept		Trend and Intercept		None	
	t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
GDPGR	-2.167635	0.2220	-3.160728	0.1149	-1.609885	0.0999
FDIPRIM	-2.484239	0.1306	-3.232700	0.1001	-2.040920	0.0416*
FDIMANU	-1.396885	0.5674	-1.936684	0.6058	-0.296986	0.5685
FDISER	3.773585	1.000	-3.10318	0.0867	4.297985	0.9999

*MacKinnon (1996) one-sided p-values.

(Result is computed by using EViews 8)

Table 12: ADF test at first difference.

Variables	Intercept		Trend and Intercept		None	
	t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
GDPGR	-4.724572	0.0010*	-5.209880	0.0017*	-4.749062	0.0000*
FDIPRIM	-5.877823	0.0001*	-5.749166	0.0005*	-5.989994	0.0000*
FDIMANU	-10.30524	0.0000*	-5.428081	0.0010*	-10.33281	0.0000*
FDISER	-7.262546	0.0000*	-3.891647	0.0303*	-7.292687	0.0000*

*MacKinnon (1996) one-sided p-values.   *(Result is computed by using EViews 8)*

According to Table 10 and 11 which interpret stationarities of GDP growth rate, FDI in primary sector (FDIPRIM), FDI in manufacturing sector and FDI in service sector, all four variables are staionary at first difference. Furthermore, the all variables in first difference will be consumed in examining causal relations.

Table 13: Granger causality test for Model 2.

Pairwise Granger Causality Tests
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DFDIPRIM does not Granger Cause DGDP	24	1.94746	0.1701
DGDP does not Granger Cause DFDIPRIM		9.82394	0.0012*
DGOVC does not Granger Cause DFDIPRIM	24	8.91258	0.0019*
DFDIPRIM does not Granger Cause DGOVC		0.42623	0.6591
DFDISER does not Granger Cause DGDP	24	0.28549	0.7548
DGDP does not Granger Cause DFDISER		10.0556	0.0011*
DFDISER does not Granger Cause DGOVC	24	0.16542	0.8487
DGOVC does not Granger Cause DFDISER		5.19522	0.0159
DFDIMANU does not Granger Cause DGDP	24	0.36103	0.7016
DGDP does not Granger Cause DFDIMANU		1.78997	0.1940
DFDIMANU does not Granger Cause DGOVC	24	0.20338	0.8177
DGOVC does not Granger Cause DFDIMANU		3.66228	0.0452*
DGOVC does not Granger Cause DGDP	24	0.91926	0.4158
DGDP does not Granger Cause DGOVC		3.81982	0.0403*

(Result is computed by using EViews 8)

The priori expectations have been held in the introduction chapter which set to be Granger causes between FDI in manufacturing sector to the Mongolian economic growth, no Granger causal relation from FDI in primary sector to the economic growth and null for FDI in service sector to the economic growth. The empirical resultsestimated by Granger test shown in Table 12is being exhibited a little different as follows.

First, There is no unidirectional causal relation to the Mongolian economic growth induced from FDI in different sectors, primary, manufacturing and service.

Second, There is growth-induced FDI in primary and service sector.

Third, There is no causal relation between FDI in manufacturing sector and economic growth of the Mongolia.

The results which FDI in primary and service sector induced by GDP growth rateis suitable with theoretical basis and empirical studies expressing GDP growth rate as one of the factors that affects on an MNC's decision to choose location which they invest in. Other interesting result has arisen by Granger test representing that government spending Granger causes FDIs in all sector, primary, manufacturing and service. It can be insightful implication since the Mongolia has an small economy and considering it to be attractful needs to make an effort from government.

To conclude, theoretically and empirically acceptable results has been achieved for the Model 2 which strives to find relation between GDP growth rate and FDI in different sectors. The causal relation is observed from GDP growth rate to FDI, particularly FDI in primary and service sectors. Moreover, 2 lag order in GDP growth difference jointly causes the FDI difference in primary and service sectors.In case of FDI in manufacturing sector indicating no causal link to GDP growth rate is a little far from most findings that other researchers found as discussed in literature review. Because of the positive spillover effects of FDI to domestic economy is mostly relevant to the manufacturing sector as usually a larger impact to host economy through a broad range of potential linkage–intensive activities using local intermediate goods and services. The reason of small amount of FDI settled in manufacturing sector would be the country's context as mentioned byHai Nguyen Thanh (2006), the Mongolian business environment is "difficult for manufacturing investment due to its land-lock geography, small population of 2.6 million (half of which is nomadic), low purchasing power, rugged land topography, as well as increasing competition from neighboring China and Russia. Thus, it can be explained that FDI in manufacturing sector is not enough attract FDI and in turn to trigger growth of the economy.

5. CHAPTER CONCLUSION AND RECOMMENDATION

Foreign Direct Investment (FDI) is deemed to be seen as distinctive one to promote economic growth based on its inherent character of spreading technology, especially, knowledge of production know-how, managerial and marketing skills that are often insufficiently settled in less-developed countries. Concerning the fact, FDI is necessities for less developing countries,because of the concept that less developed countries can absorb positive spillovers of FDI which is created by MNCs originated from developed world with forefront technologies resulted from high-level R&D attainment in their own field.

There are tremendous empirical studies dealing with the matter of how FDI affects on economic growth of recipient economy. Not all empirical studies have found positive relation between economic growth and FDI, this pushes other direction of studies out in this field. Moreover, some studies started to concentrate on sectoral effect of FDI on economic in order to have more proper consequences. In this view, most of previous empirical studies have reached the results that FDI in primary sector has a negative effect on economic growth, the impact for manufacturing is positive and growth effect of FDI in service sector is ambiguous.

For diagnosing the relationship at first attempt, this thesis employs the Mongolian data for its empirical study and has derived theoretically and empirically acceptable results for relation between GDP growth rate and FDI.

➢ In the aggragate level, FDI is observed to have both short-run impact and long-run impact on the economic growth as results of Wald test and Error correction term (C_1), respectively, in VECM framework. The model is fitted well with determination coefficient of 0.922 depicting that 92.2 percent of the flactuation in the percentage change of GDP growth rate is affected by the flactuations in independent

variables (share of FDI to GDP, government expenditure and their lags) in the Mongolia. Therefore, the adjusted R^2 of 0.7955 or almost 80 percent suggested that the independent variables are robust in describing the variation in GDP growth rate, thereby it represents a good fit. Likewise, the F-Statistics of 7.28 with probability of 0.004 indicates that the model is significant at 1% level and is a good fit expressing the implication that the estimates and inferences drawn are reliable. For concerning the Durbin Watson statistic of 2.06, there is an absence of first order serial correlation in the model. Therefore, the residuals have absence of serial-correlation and heteroskedasticity and distributed normally.

➢ In the sectoral level, a causal relation is obserbed from GDP growth rate to FDI, particularly FDI in primary and service sectors. Moreover, 2 lag order in GDP growth difference jointly causes the FDI difference in primary and service sectors. In case of FDI in manufacturing sector indicating no causal link to GDP growth rate is a little far from most findings that other researchers found as discussed in literature review. Because of the positive spillover effects of FDI to domestic economy is mostly relevant to the manufacturing sector as usually a larger impact to host economy through a broad range of potential linkage–intensive activities using local intermediate goods and services. The reason of small amount of FDI settled in manufacturing sector would be the country's context as mentioned by Hai Nguyen Thanh (2006), the Mongolian business environment is "difficult for manufacturing investment due to its land-lock geography, small population of 2.6 million (half of which is nomadic), low purchasing power, rugged land topography, as well as increasing competition from neighboring China and Russia. Thus, it can be explained that FDI in manufacturing sector is not enough attract FDI and in turn to trigger growth of the economy.

All in all, the main contribution of the thesis is first time to estimate growth impact of FDI in the Mongolian case in general andto bring out the relationship on different sectors of the economy that are primary, secondary and tertiary/services sectors.

Concerning the importance of the thesis, following recommendations could be in attention.

➢ The paper can be useful for the policymakers who often argue if the FDI has an positive or negative impact on the economy and can be one of the acceptable studies for further policy in its frame.

➢ For the country's social groups (researchers, workers in the public sector and herders, etc.,) which have different thoughts and understandings about the influence of FDI on economy of the country, the paper could give a fundamental concepts theoretically and empirically and could make them to be grasped proper conjoint notions.

➢ Furthermore, this study is significant for upcoming studies which will be examined in this field later to acquire an information of the topic and assessment in case of the country.

REFERENCES

Abdul, K. and Ilan, N. (2007).Foreign Direct Investment and Economic Growth: Empirical Evidence from Sectoral Data in Indonesia.

Atrayee Ghosh, R. and Van den Berg, H. F. (2006). Foreign Direct Investment and Economic Growth: A Time-Series Approach. Global Economy Journal, 6. 7-7.

Borensztein, E., De Gregorio, J. and Lee, J-W. (1996). How does foreign direct investment affect economic growth?. Journal of International Economics 45, (1998), 115-135.

Central Intelligence Agency (CIA). (2016). The World Factbook. https://www.cia.gov/library/publications/the-world-factbook/geos/mg.html

Charles Jones, I. (1995). R & D-Based Models of Economic Growth. Journal of Political Economy, Vol. 103, No. 4 (Aug., 1995), pp. 759-784.

Claes Friberg och Gustav, L. (2007). Entry Mode Strategy and the Effect of National Culture on Foreign Subsidiary Performance. Swedish Institute for Growth policy studies, R2007:003.

Dinh Thi Thanh, B. (2009). Investment behavior by foreign firms in transition economies the case of Vietnam. CIFREM.

Enkh-Otgon, D. and Baigalmaa, Z. (2009). Technology transfer: Challenges in Mongolia.http://www.wipo.int/edocs/mdocs/aspac/en/wipo_ip_cm_09/wipo_ip_cm _09_topic12_mongolia.pdf

Hai Nguyen, T. (2006). The Mongolia: Competitiveness assessment of the Industrial sector. Open Society Forum, ISBN 978-99929-56-22-4.
http://www.liaa.gov.lv/files/liaa/attachments/presentation_law_investment.pdf
https://hr.un.org/sites/hr.un.org/files/Managing%20a%20natural%20resource%20 boom%20in%20a%20transition%20economy%20context.pdf
https://www.researchgate.net/publication/317602978_Influence_of_Foreign_Direc t_Investments_on_the_Development_of_Mongolia

Imamul Haque, S. M. and Ishfaq Ahmad, T. (2013). Role of foreign direct investment in labour intensive industries: A comparison between India and China. G.J.C.M.P., Vol.2(3), 2013:77-83.

Javkhlanbaatar, S. (2013). Mongolian Law on Investment.

Katerina, L., Papanastasiou, J. and Vamvakidis, A. (2004). Foreign Direct Investment and Economic Growth in Transition Economies. South Eastern Europe Journal of Economics, 1. 97-110.

Khondoker Abdul, M. and Kaliappa, K. (2010).Determinants of Foreign Direct Investment in Developing Countries: A Comparative Analysis. ASARC Working Paper 2010/13.

Kurtishi-Kastrati, S. (2013). Impact of FDI on economic growth: An overview of the main theories of FDI and empirical research. Europian Scientific Journal, March 2013, Vol.9, No.7.

Laura, A. (2003). Foreign Direct Investment and Growth: Does the Sector Matter?.Harvard Business School.

Leonid, M., Oleksandr, K. and Serhiy, P. (2014). The impact of foreign direct investment on economic growth: case of post communism transition economies. Problems and Perspectives in Management, 12(1).

Lynge, N. (2011). Classifications of Countries Based on their Level of Development: How it is done and how it could be done. International Monetary Fund, WP/11/31.

Maralgua, O., Christian, B. and Tsolmon, J. (2017). Determinants of inward FDI in the Mongolia: An application of the ARDL bounds testing approach to cointegration. Asian Economic and Financial Review, 2017, 7(3): 307-333.

Marco, N. (2006). The Impact of FDI on Economic Growth: An Analysis for the Transition Countries of Central and Eastern Europe.

Maria-Ramona, S. and Iuliana Mazur c s., G. (2014). Forms and motivations of foreign direct investment. SEA-Practical Application of Science, Vol.II, Issue 1 (3).

Matej, Š. (2015). Influence of Foreign Direct Investments on the Development of Mongolia. 10.13140/RG.2.2.11739.77605.

Mehmet, D., Ekrem, T. and Adiya, O. (2005). Patterns of Foreign Direct Investment in Mongolia, 1990–2003: A Research Note. Eurasian Geography and Economics, 46. 247-259.

Mohammad Amin, A. and Mahmoud Khalid, A. (2013). Foreign Direct Investment and Economic Growth Literature Review from 1994 to 2012. Procedia-Social and Behavioral Sciences, 129 (2014) 206-213.

Nguyen, Y., Duysters, G., Pattersonand, J. and Sander, H. (2009). Foreign Direct Investment Absorptive Capacity Theory.

Noureddine, E. and Hamid, F. (2016). FDI, Trade Balance and Growth: the Sector does matter.

Onyeagu Augustina, N. (2013). An econometric analysis of the impact of FDI on economic growth in Ghana: the role of human capital development. International Journal of Humanities and Social Science Invention, Vol.2, Issue 8, (August 2013), PP.12-20.

Organisation for Economic Co-operationa and Development. (2002). Foreign Direct Investment for Development: maximising benefits, minimising costs. OECD overview.
https://www.oecd.org/investment/investmentfordevelopment/1959815.pdf

Oyunbadam, D. (2013). Development Strategies and Structural Change in Mongolian Economy: An Analysis of Trends, Patterns and Determinants of Trade and Investment.

Ozturk, I. (2007). Foreign direct investment - Growth nexus: A review of the recent literature. International Journal of Applied Econometrics and Quantitative Studies, Vol.4-2 (2007).

Rio Tinti. (2013). Oyu Tolgoi. 23rd October 2013. https://web.archive.org/web/20131023035324/http://www.riotinto.com/ourbusiness/oyu-tolgoi-4025.aspx

Robert Barro, J. and Sala-i-Martin, X. (1999). Economic growth. The MIT press Cambridge.

Serebrennikov, I. I. (1931).A Soviet Satellite: Outer Mongolia Today. https://www.foreignaffairs.com/articles/mongolia/1931-04-01/soviet-satellite-outer-mongolia-today

Simona-Gabriela, M. S. (2008). FDI role in promoting economic growth–An international review.

Solongo, G. (2017). Financial Resources Management for SME'S of Mongolia. International Business Research, Vol.10, No.6.

Sonmez, A. (2013). Multinational Companies, Knowledge and Technology Transfer: Theoretical framework.

Sourafel, G. and Holger, G. (2005). Foreign direct investment, spillovers and absorptive capacity: evidence from quantile regressions. Deutsche Bundes Bank, Series 1, No.12/2005.

Suleyman, T. and Osman, D. (2015). The growth impact of FDI in a technology interdependent world.

Tam Bang, Vu., Byron, G. and Ilan, N. (2006). Is Foreign Direct Investment Good for Growth? Evidence from Sectoral Analysis of China and Vietnam. Journal of the Asia Pacific Economy, 13:4, 542-562.

Togtokhbuyan, L. and Huo, X. (2014). Analysis of the Returns of Small and Medium-Sized Enterprises in Mongolia. Journal of Finance and Accounting, Vol. 2, No. 3, pp. 41-47.

Tserenpuntsag, B. (2015). Managing a natural resource boom in a transition economy context.

U.S. Department of State. (2017). Mongolia investment climate statement.https://mn.usembassy.gov/wp-content/uploads/sites/192/2017/06/2017-Mongolia-Investment-Climate-Statement.pdf

United Nations Conference on Trade and Development. (2012). Mongolıa sector-specıfıc investment strategy and action plan.UNCTAD, Pilot Study Results.

United Nations Conference on Trade and Development. (2017). World investment report.

World Economic Forum. (2018). The Global Competitiveness Report. http://www.mlsi.gov.cy/mlsi/kepa/kepa_new.nsf/0971B9AB2CD95049C22581D20034D44D/$file/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

Xinfeng,Y. and Majagaiya, K. P. (2011). Relationship between FDI and economic growth: case study of Nepal. International Journal of Business and Management, Vol.6, No.6, June 2011.

Zahid, I. and Kosar, A. (2015). An Econometric Analysis of Foreign Direct Investment and Economic Growth of Pakistan. Developing country studies, Vol.5, No.11, 2015.

APPENDIX

Appendix 1: ADF tests for Model 1.

Null Hypothesis: GDPGR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.160728	0.1149
Test critical values: 1% level	-4.374307	
5% level	-3.603202	
10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDPGR)
Method: Least Squares
Date: 06/26/18   Time: 15:50
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPGR(-1)	-0.708285	0.224089	-3.160728	0.0047
D(GDPGR(-1))	0.424257	0.215908	1.964990	0.0628
C	-0.219014	1.948094	-0.112425	0.9116
@TREND("1990")	0.275290	0.177327	1.552444	0.1355
R-squared	0.372536	Mean dependent var	0.386800
Adjusted R-squared	0.282898	S.D. dependent var	4.560556
S.E. of regression	3.861965	Akaike info criterion	5.685876
Sum squared resid	313.2102	Schwarz criterion	5.880896
Log likelihood	-67.07345	Hannan-Quinn criter.	5.739966
F-statistic	4.156013	Durbin-Watson stat	2.080847
Prob(F-statistic)	0.018507		

Null Hypothesis: D(GDPGR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.209880	0.0017
Test critical values: 1% level	-4.394309	
5% level	-3.612199	
10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDPGR,2)
Method: Least Squares
Date: 06/26/18   Time: 15:50
Sample (adjusted): 1993 2016
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDPGR(-1))	-1.449060	0.278137	-5.209880	0.0000
D(GDPGR(-1),2)	0.401513	0.193971	2.069964	0.0516
C	3.937413	2.135677	1.843637	0.0801
@TREND("1990")	-0.227838	0.131882	-1.727597	0.0995

				-
R-squared	0.613794	Mean dependent var	0.033750
Adjusted R-squared	0.555863	S.D. dependent var	6.463628
S.E. of regression	4.307595	Akaike info criterion	5.909648
Sum squared resid	371.1075	Schwarz criterion	6.105991
Log likelihood	-66.91578	Hannan-Quinn criter.	5.961738
F-statistic	10.59527	Durbin-Watson stat	2.079775
Prob(F-statistic)	0.000220		

Null Hypothesis: FDIRAW** has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 5 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.439442	1.0000
Test critical values:	1% level	-4.467895	
	5% level	-3.644963	
	10% level	-3.261452	

*MacKinnon (1996) one-sided p-values.
**FDI in absolute amount (US$)

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDIRAW)
Method: Least Squares
Date: 06/26/18   Time: 15:52
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDIRAW(-1)	22.39008	6.509801	3.439442	0.0044
D(FDIRAW(-1))	-23.40530	6.635239	-3.527424	0.0037
D(FDIRAW(-2))	-24.62029	6.868770	-3.584381	0.0033
D(FDIRAW(-3))	-26.40420	7.433221	-3.552188	0.0035
D(FDIRAW(-4))	-28.47626	7.906831	-3.601476	0.0032

D(FDIRAW(-5))	-31.81144	8.855075	-3.592453	0.0033
C	1519406.	980619.5	1.549435	0.1453
@TREND("1990")	-184432.4	99905.77	-1.846063	0.0878

R-squared	0.720090	Mean dependent var	69189.14
Adjusted R-squared	0.569369	S.D. dependent var	1090671.
S.E. of regression	715725.5	Akaike info criterion	30.08231
Sum squared resid	6.66E+12	Schwarz criterion	30.48023
Log likelihood	-307.8643	Hannan-Quinn criter.	30.16867
F-statistic	4.777641	Durbin-Watson stat	1.857192
Prob(F-statistic)	0.007439		

Null Hypothesis: D(FDIRAW) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 5 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.576214	0.9999
Test critical values:	1% level	-4.498307	
	5% level	-3.658446	
	10% level	-3.268973	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDIRAW,2)
Method: Least Squares
Date: 06/26/18   Time: 15:54
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDIRAW(-1))	20.09978	12.75194	1.576214	0.1410
D(FDIRAW(-1),2)	-21.61890	12.68585	-1.704175	0.1141
D(FDIRAW(-2),2)	-23.12978	12.88098	-1.795653	0.0978
D(FDIRAW(-3),2)	-25.43295	13.50436	-1.883314	0.0841
D(FDIRAW(-4),2)	-27.92581	14.00568	-1.993892	0.0694
D(FDIRAW(-5),2)	-31.93060	15.18311	-2.103035	0.0572
C	-645139.0	902329.5	-0.714971	0.4883
@TREND("1990")	48528.96	74514.14	0.651272	0.5271

R-squared	0.840790	Mean dependent var	3785.150
Adjusted R-squared	0.747918	S.D. dependent var	1731901.
S.E. of regression	869549.1	Akaike info criterion	30.47851
Sum squared resid	9.07E+12	Schwarz criterion	30.87680
Log likelihood	-296.7851	Hannan-Quinn criter.	30.55626
F-statistic	9.053179	Durbin-Watson stat	1.886459
Prob(F-statistic)	0.000563		

Null Hypothesis: FDI** has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.302089	0.0881
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.
**FDI describes the share of FDI to GDP.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 06/26/18   Time: 15:55
Sample (adjusted): 1991 2016
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.656933	0.198945	-3.302089	0.0031
C	-0.002886	0.004116	-0.701216	0.4902
@TREND("1990")	0.000659	0.000332	1.985445	0.0591
R-squared	0.322130	Mean dependent var	0.000485
Adjusted R-squared	0.263185	S.D. dependent var	0.011369
S.E. of regression	0.009759	Akaike info criterion	-6.313149
Sum squared resid	0.002190	Schwarz criterion	-6.167984
Log likelihood	85.07094	Hannan-Quinn criter.	-6.271347
F-statistic	5.464910	Durbin-Watson stat	1.845710
Prob(F-statistic)	0.011434		

Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 4 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.651484	0.0494
Test critical values:	1% level	-4.467895	
	5% level	-3.644963	
	10% level	-3.261452	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 06/26/18   Time: 15:56
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-7.659450	2.097626	-3.651484	0.0026
D(FDI(-1),2)	5.955763	1.924878	3.094098	0.0079
D(FDI(-2),2)	4.842390	1.670278	2.899152	0.0117
D(FDI(-3),2)	3.676442	1.262888	2.911138	0.0114
D(FDI(-4),2)	2.016103	0.739832	2.725082	0.0164
C	-0.012558	0.008766	-1.432526	0.1739
@TREND("1990")	0.001461	0.000687	2.126377	0.0517

R-squared	0.788592	Mean dependent var		1.77E-05
Adjusted R-squared	0.697988	S.D. dependent var		0.019636
S.E. of regression	0.010791	Akaike info criterion		-5.958947
Sum squared resid	0.001630	Schwarz criterion		-5.610773
Log likelihood	69.56895	Hannan-Quinn criter.		-5.883384
F-statistic	8.703773	Durbin-Watson stat		1.983688
Prob(F-statistic)	0.000452			

Null Hypothesis: INF has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.313890	0.0870
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 06/26/18   Time: 15:57
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.657482	0.198402	-3.313890	0.0032
C	72.54332	33.34690	2.175414	0.0406
@TREND("1990")	-3.609122	1.909226	-1.890359	0.0720

R-squared	0.333187	Mean dependent var	2.064000
Adjusted R-squared	0.272568	S.D. dependent var	67.72257
S.E. of regression	57.76035	Akaike info criterion	11.06265
Sum squared resid	73397.66	Schwarz criterion	11.20891
Log likelihood	-135.2831	Hannan-Quinn criter.	11.10322
F-statistic	5.496376	Durbin-Watson stat	0.827457
Prob(F-statistic)	0.011589		

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.552437	0.0594
Test critical values:	1% level	-4.467895	
	5% level	-3.644963	
	10% level	-3.261452	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 06/26/18   Time: 15:58
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-0.796240	0.224139	-3.552437	0.0029
D(INF(-1),2)	-0.335292	0.181939	-1.842879	0.0852
D(INF(-2),2)	-0.234648	0.072174	-3.251156	0.0054
D(INF(-3),2)	-0.081961	0.044965	-1.822782	0.0883
C	5.072512	7.037767	0.720756	0.4821
@TREND("1990")	-0.293629	0.374015	-0.785073	0.4446

R-squared	0.717312	Mean dependent var	0.590476
Adjusted R-squared	0.623082	S.D. dependent var	11.85559
S.E. of regression	7.278573	Akaike info criterion	7.042703
Sum squared resid	794.6643	Schwarz criterion	7.341138
Log likelihood	-67.94838	Hannan-Quinn criter.	7.107471
F-statistic	7.612399	Durbin-Watson stat	2.630588
Prob(F-statistic)	0.000971		

Null Hypothesis: TRADE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.565034	0.7766
Test critical values: 1% level	-4.394309	
5% level	-3.612199	
10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRADE)
Method: Least Squares
Date: 06/26/18   Time: 15:59
Sample (adjusted): 1993 2016
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE(-1)	-0.468708	0.299487	-1.565034	0.1341
D(TRADE(-1))	-0.275672	0.297285	-0.927300	0.3654
D(TRADE(-2))	0.000945	0.185307	0.005102	0.9960
C	55.33321	30.29147	1.826693	0.0835
@TREND("1990")	-0.253102	0.474806	-0.533065	0.6002

R-squared	0.534455	Mean dependent var	1.345000
Adjusted R-squared	0.436446	S.D. dependent var	18.67730
S.E. of regression	14.02110	Akaike info criterion	8.302056
Sum squared resid	3735.235	Schwarz criterion	8.547484
Log likelihood	-94.62467	Hannan-Quinn criter.	8.367168
F-statistic	5.453095	Durbin-Watson stat	1.428998
Prob(F-statistic)	0.004259		

Null Hypothesis: D(TRADE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.103846	0.0021
Test critical values: 1% level	-4.394309	
5% level	-3.612199	
10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRADE,2)
Method: Least Squares
Date: 06/26/18   Time: 15:59
Sample (adjusted): 1993 2016
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(TRADE(-1))	-1.768408	0.346485	-5.103846	0.0001
D(TRADE(-1),2)	0.138932	0.168107	0.826447	0.4183
C	9.117524	6.988783	1.304594	0.2068
@TREND("1990")	-0.599454	0.435031	-1.377957	0.1834

R-squared	0.876702	Mean dependent var	3.272083
Adjusted R-squared	0.858207	S.D. dependent var	38.56084
S.E. of regression	14.52025	Akaike info criterion	8.339977
Sum squared resid	4216.752	Schwarz criterion	8.536319
Log likelihood	-96.07972	Hannan-Quinn criter.	8.392067
F-statistic	47.40272	Durbin-Watson stat	1.537832
Prob(F-statistic)	0.000000		

Null Hypothesis: GOVC has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.425868	0.3588
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GOVC)
Method: Least Squares
Date: 06/26/18   Time: 16:00
Sample (adjusted): 1991 2016
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GOVC(-1)	-0.427435	0.176199	-2.425868	0.0235
C	1549147.	31749889	0.048792	0.9615
@TREND("1990")	1186812.	2188515.	0.542291	0.5928

R-squared	0.207019	Mean dependent var	89502.34
Adjusted R-squared	0.138064	S.D. dependent var	84217299
S.E. of regression	78187781	Akaike info criterion	39.29529
Sum squared resid	1.41E+17	Schwarz criterion	39.44046
Log likelihood	-507.8388	Hannan-Quinn criter.	39.33709
F-statistic	3.002232	Durbin-Watson stat	1.936828
Prob(F-statistic)	0.069426		

Null Hypothesis: D(GOVC) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.667696	0.0006
Test critical values: 1% level	-4.374307	
5% level	-3.603202	
10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GOVC,2)
Method: Least Squares
Date: 06/26/18   Time: 16:00
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GOVC(-1))	-1.187038	0.209439	-5.667696	0.0000
C	13345889	38501994	0.346629	0.7322
@TREND("1990")	-945521.2	2446007.	-0.386557	0.7028

R-squared	0.593517	Mean dependent var		10030.26
Adjusted R-squared	0.556564	S.D. dependent var		1.32E+08
S.E. of regression	87986350	Akaike info criterion		39.53543
Sum squared resid	1.70E+17	Schwarz criterion		39.68169
Log likelihood	-491.1929	Hannan-Quinn criter.		39.57600
F-statistic	16.06139	Durbin-Watson stat		2.019686
Prob(F-statistic)	0.000050			

Appendix 2: Johansen cointegration test result.

Date: 06/26/18   Time: 16:01
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments
Trend assumption: Linear deterministic trend
Series: GDPGR FDI GOVC
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.898112	67.86355	29.79707	0.0000
At most 1 *	0.486355	17.61823	15.49471	0.0236
At most 2	0.125940	2.961348	3.841466	0.0853

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.898112	50.24531	21.13162	0.0000
At most 1 *	0.486355	14.65689	14.26460	0.0433
At most 2	0.125940	2.961348	3.841466	0.0853

 Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

 Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

GDPGR	FDI	GOVC
1.091142	-1807.018	2.30E-07
0.552453	-45.54892	-1.47E-08
0.518460	-737.3860	6.22E-08

 Unrestricted Adjustment Coefficients (alpha):

D(GDPGR)	-1.898995	-0.733608	-0.064790
D(FDI)	-0.000523	-0.000210	-0.000457
D(GOVC)	9394044.	20675180	8744690.

1 Cointegrating Equation(s): Log likelihood   -310.5824

Normalized cointegrating coefficients (standard error in parentheses)

GDPGR	FDI	GOVC
1.000000	-1656.080	2.11E-07
	(84.7696)	(1.3E-08)

Adjustment coefficients (standard error in parentheses)

D(GDPGR)	-2.072073
	(0.48013)
D(FDI)	-0.000570
	(0.00051)
D(GOVC)	10250233
	(1.5E+07)

2 Cointegrating Equation(s): Log likelihood   -303.2540

Normalized cointegrating coefficients (standard error in parentheses)

GDPGR	FDI	GOVC
1.000000	0.000000	-3.91E-08
		(1.8E-08)
0.000000	1.000000	-1.51E-10
		(1.1E-11)

Adjustment coefficients (standard error in parentheses)

D(GDPGR)	-2.477357	3464.934
	(0.43474)	(642.530)
D(FDI)	-0.000686	0.954010
	(0.00057)	(0.84182)
D(GOVC)	21672295	-1.79E+10
	(1.4E+07)	(2.1E+10)

Appendix 3: Error correction model results.

Vector Error Correction Estimates
Date: 06/11/18   Time: 05:38
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1		
GDPGR(-1)	1.000000		
FDI(-1)	-1656.080		
	(84.7696)		
	[-19.5363]		
GOVC(-1)	2.11E-07		
	(1.3E-08)		
	[16.2643]		
C	-0.092225		

Error Correction:	D(GDPGR)	D(FDI)	D(GOVC)
CointEq1	-2.072073	-0.000570	10250233
	(0.48013)	(0.00051)	(1.5E+07)
	[-4.31561]	[-1.10822]	[0.68693]
D(GDPGR(-1))	0.434775	-0.000124	10643732
	(0.27562)	(0.00030)	(8565769)
	[1.57745]	[-0.41942]	[1.24259]
D(GDPGR(-2))	0.683689	0.000135	-3485140.
	(0.24419)	(0.00026)	(7589017)
	[2.79981]	[0.51479]	[-0.45923]
D(GDPGR(-3))	0.370470	0.000247	-7540827.
	(0.23857)	(0.00026)	(7414439)
	[1.55285]	[0.96732]	[-1.01705]
D(GDPGR(-4))	-0.006667	-0.000203	7296836.
	(0.20332)	(0.00022)	(6318720)

	[-0.03279]	[-0.93162]	[1.15480]
D(FDI(-1))	-2983.574	-2.130702	1.70E+10
	(541.931)	(0.58083)	(1.7E+10)
	[-5.50545]	[-3.66840]	[1.00785]
D(FDI(-2))	-2222.461	-2.621449	3.32E+10
	(394.853)	(0.42319)	(1.2E+10)
	[-5.62858]	[-6.19448]	[2.70768]
D(FDI(-3))	149.4253	-0.835181	1.21E+10
	(138.099)	(0.14801)	(4.3E+09)
	[1.08201]	[-5.64270]	[2.82817]
D(FDI(-4))	1274.047	1.110068	-1.74E+10
	(272.661)	(0.29223)	(8.5E+09)
	[4.67263]	[3.79861]	[-2.05883]
D(GOVC(-1))	3.75E-07	6.76E-11	-1.335428
	(1.0E-07)	(1.1E-10)	(3.13563)
	[3.71263]	[0.62486]	[-0.42589]
D(GOVC(-2))	4.13E-07	1.25E-10	-0.804632
	(9.7E-08)	(1.0E-10)	(3.02713)
	[4.23752]	[1.19375]	[-0.26581]
D(GOVC(-3))	5.17E-07	3.19E-10	-3.626262
	(9.1E-08)	(9.7E-11)	(2.81488)
	[5.70255]	[3.28643]	[-1.28825]
D(GOVC(-4))	3.64E-07	3.74E-10	-5.249683
	(7.0E-08)	(7.5E-11)	(2.17520)
	[5.20285]	[4.98047]	[-2.41342]
C	0.170277	0.002275	-12327375
	(0.59093)	(0.00063)	(1.8E+07)
	[0.28815]	[3.59171]	[-0.67125]
R-squared	0.922080	0.987883	0.814372
Adj. R-squared	0.795459	0.968192	0.512725
Sum sq. resids	34.07809	3.91E-05	3.29E+16
S.E. equation	2.063919	0.002212	64142886
F-statistic	7.282230	50.16962	2.699758
Log likelihood	-36.03038	114.4154	-415.5748
Akaike AIC	4.548217	-9.128670	39.05225
Schwarz SC	5.242516	-8.434370	39.74655
Mean dependent	-0.052273	0.000538	104402.2
S.D. dependent	4.563548	0.012403	91888598

Determinant resid covariance (dof adj.)	7.63E+09
Determinant resid covariance	3.67E+08
Log likelihood	-310.5824
Akaike information criterion	32.32567
Schwarz criterion	34.55735

Dependent Variable: D(GDPGR)
Method: Least Squares
Date: 06/26/18   Time: 16:04
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments
D(GDPGR) = C(1)*(GDPGR(-1) - 1656.0804583*FDI(-1) +
      2.10904575057E-07*GOVC(-1) - 0.0922253004115) + C(2)
      *D(GDPGR(-1)) + C(3)*D(GDPGR(-2)) + C(4)*D(GDPGR(-3))
+ C(5)
      *D(GDPGR(-4)) + C(6)*D(FDI(-1)) + C(7)*D(FDI(-2)) +
C(8)*D(FDI(-3)) +
      C(9)*D(FDI(-4)) + C(10)*D(GOVC(-1)) + C(11)*D(GOVC(-2))
+ C(12)
      *D(GOVC(-3)) + C(13)*D(GOVC(-4)) + C(14)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-2.072073	0.480134	-4.315613	0.0026
C(2)	0.434775	0.275620	1.577445	0.1533
C(3)	0.683689	0.244191	2.799812	0.0232
C(4)	0.370470	0.238574	1.552854	0.1591
C(5)	-0.006667	0.203317	-0.032793	0.9746
C(6)	-2983.574	541.9308	-5.505451	0.0006
C(7)	-2222.461	394.8526	-5.628585	0.0005
C(8)	149.4253	138.0995	1.082012	0.3108
C(9)	1274.047	272.6614	4.672633	0.0016
C(10)	3.75E-07	1.01E-07	3.712630	0.0059
C(11)	4.13E-07	9.74E-08	4.237525	0.0028
C(12)	5.17E-07	9.06E-08	5.702551	0.0005
C(13)	3.64E-07	7.00E-08	5.202850	0.0008
C(14)	0.170277	0.590927	0.288153	0.7806

R-squared	0.922080	Mean dependent var	0.052273
Adjusted R-squared	0.795459	S.D. dependent var	4.563548
S.E. of regression	2.063919	Akaike info criterion	4.548217
Sum squared resid	34.07809	Schwarz criterion	5.242516
Log likelihood	-36.03038	Hannan-Quinn criter.	4.711773
F-statistic	7.282230	Durbin-Watson stat	2.058514
Prob(F-statistic)	0.004254		

Appendix 4: Results of Wald test.

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	10.57574	(4, 8)	0.0028
Chi-square	42.30296	4	0.0000

Null Hypothesis: C(6)=C(7)=C(8)=C(9)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(6)	-2983.574	541.9308
C(7)	-2222.461	394.8526
C(8)	149.4253	138.0995
C(9)	1274.047	272.6614

Restrictions are linear in coefficients.

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	14.77341	(4, 8)	0.0009
Chi-square	59.09363	4	0.0000

Null Hypothesis: C(10)=C(11)=C(12)=C(13)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(10)	3.75E-07	1.01E-07
C(11)	4.13E-07	9.74E-08
C(12)	5.17E-07	9.06E-08
C(13)	3.64E-07	7.00E-08

Restrictions are linear in coefficients.

Appendix 5:Diagnosis of residuals.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.047112	Prob. F(2,6)	0.9543
Obs*R-squared	0.340148	Prob. Chi-Square(2)	0.8436

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 06/16/18   Time: 16:14
Sample: 1995 2016
Included observations: 22
Presample missing value lagged residuals set to zero.

Variable	Coefficient Std. Error	t-Statistic	Prob.

C(1)	0.026456	0.746218	0.035453	0.9729
C(2)	-0.030351	0.331069	-0.091675	0.9299
C(3)	0.025371	0.298760	0.084923	0.9351
C(4)	0.013505	0.382813	0.035279	0.9730
C(5)	-0.011930	0.237622	-0.050207	0.9616
C(6)	3.078462	669.4525	0.004598	0.9965
C(7)	-56.63459	589.8134	-0.096021	0.9266
C(8)	-30.34771	188.0104	-0.161415	0.8771
C(9)	-3.194697	412.3187	-0.007748	0.9941
C(10)	-8.87E-09	1.68E-07	-0.052924	0.9595
C(11)	-8.51E-09	1.39E-07	-0.061397	0.9530
C(12)	5.69E-11	1.30E-07	0.000439	0.9997
C(13)	3.47E-09	1.08E-07	0.032029	0.9755
C(14)	0.051132	0.770289	0.066381	0.9492
RESID(-1)	-0.123462	0.773405	-0.159634	0.8784
RESID(-2)	-0.138847	0.786169	-0.176612	0.8656

R-squared	0.015461	Mean dependent var	-3.39E-15
Adjusted R-squared	-2.445886	S.D. dependent var	1.273878
S.E. of regression	2.364713	Akaike info criterion	4.714453
Sum squared resid	33.55120	Schwarz criterion	5.507938
Log likelihood	-35.85898	Hannan-Quinn criter.	4.901374
F-statistic	0.006282	Durbin-Watson stat	1.983502
Prob(F-statistic)	1.000000		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.622758	Prob. F(15,6)	0.7867
Obs*R-squared	13.39582	Prob. Chi-Square(15)	0.5718
Scaled explained SS	1.701813	Prob. Chi-Square(15)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/16/18   Time: 16:15
Sample: 1995 2016
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.030084	1.432338	0.719163	0.4991
GDPGR(-1)	0.658429	0.478252	1.376742	0.2178
FDI(-1)	-16.15582	506.6450	-0.031888	0.9756
GOVC(-1)	9.70E-09	2.76E-08	0.351291	0.7374
GDPGR(-2)	-0.618646	0.556196	-1.112281	0.3086
GDPGR(-3)	0.397004	0.415936	0.954482	0.3767
GDPGR(-4)	0.149811	0.435269	0.344180	0.7425
GDPGR(-5)	-0.121087	0.333340	-0.363252	0.7289
FDI(-2)	125.7485	485.9928	0.258746	0.8045
FDI(-3)	-309.5528	526.8008	-0.587609	0.5782
FDI(-4)	-392.8784	378.2780	-1.038597	0.3390

FDI(-5)	216.4728	346.8919	0.624035	0.5556
GOVC(-2)	-7.33E-09	2.81E-08	-0.260858	0.8029
GOVC(-3)	-1.71E-08	5.19E-08	-0.328787	0.7535
GOVC(-4)	-2.67E-08	4.56E-08	-0.584725	0.5800
GOVC(-5)	6.63E-08	9.13E-08	0.726213	0.4951

R-squared	0.608901	Mean dependent var	1.549004
Adjusted R-squared	-0.368847	S.D. dependent var	2.197724
S.E. of regression	2.571288	Akaike info criterion	4.881953
Sum squared resid	39.66913	Schwarz criterion	5.675439
Log likelihood	-37.70149	Hannan-Quinn criter.	5.068875
F-statistic	0.622758	Durbin-Watson stat	2.136364
Prob(F-statistic)	0.786688		

Series: Residuals	
Sample 1995 2016	
Observations 22	
Mean	-3.39e-15
Median	-0.091138
Maximum	2.691327
Minimum	-2.328757
Std. Dev.	1.273878
Skewness	0.257083
Kurtosis	2.921489
Jarque-Bera	0.247987
Probability	0.883386
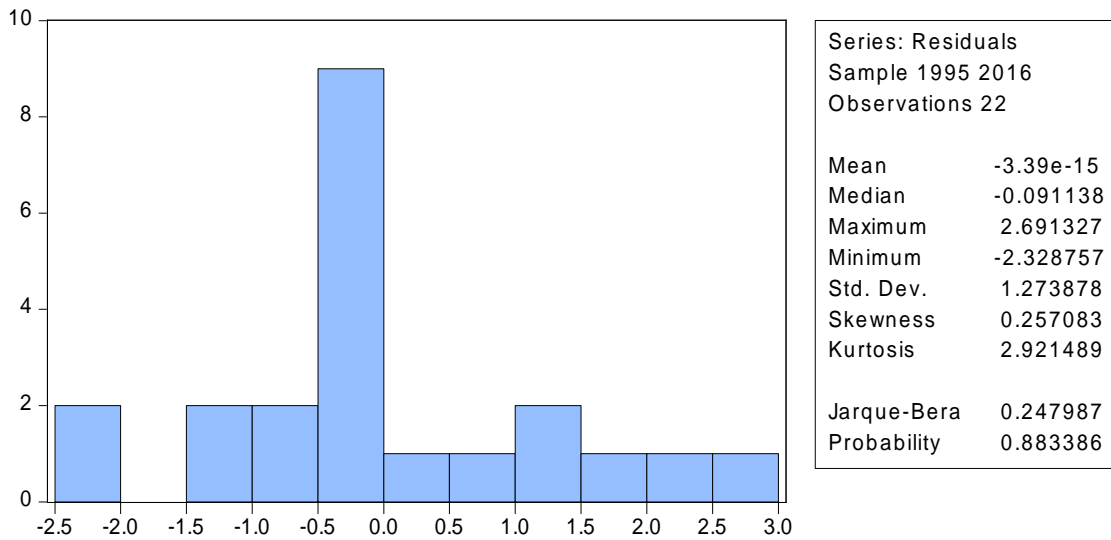
Appendix 6: ADF test results for Model 2.

Null Hypothesis: FDIPRIM has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.232700	0.1001
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDIPRIM)
Method: Least Squares

Date: 06/26/18   Time: 16:09
Sample (adjusted): 1991 2016
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDIPRIM(-1)	-0.626845	0.193908	-3.232700	0.0037
C	-252710.5	295063.8	-0.856461	0.4006
@TREND("1990")	42941.77	22604.47	1.899703	0.0701

R-squared	0.312431	Mean dependent var		34932.10
Adjusted R-squared	0.252642	S.D. dependent var		803849.7
S.E. of regression	694927.1	Akaike info criterion		29.84917
Sum squared resid	1.11E+13	Schwarz criterion		29.99433
Log likelihood	-385.0392	Hannan-Quinn criter.		29.89097
F-statistic	5.225585	Durbin-Watson stat		1.875427
Prob(F-statistic)	0.013463			

Null Hypothesis: D(FDIPRIM) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.749166	0.0005
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDIPRIM,2)
Method: Least Squares
Date: 06/26/18   Time: 16:09
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDIPRIM(-1))	-1.201371	0.208964	-5.749166	0.0000
C	60583.08	366774.8	0.165178	0.8703
@TREND("1990")	-1305.796	23281.66	-0.056087	0.9558

R-squared	0.600396	Mean dependent var		6518.826
Adjusted R-squared	0.564069	S.D. dependent var		1271204.
S.E. of regression	839313.5	Akaike info criterion		30.23072
Sum squared resid	1.55E+13	Schwarz criterion		30.37699
Log likelihood	-374.8840	Hannan-Quinn criter.		30.27129
F-statistic	16.52727	Durbin-Watson stat		2.122033
Prob(F-statistic)	0.000041			

Null Hypothesis: FDIMANU has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.936684	0.6058
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDIMANU)
Method: Least Squares
Date: 06/26/18   Time: 16:10
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDIMANU(-1)	-0.543254	0.280507	-1.936684	0.0664
D(FDIMANU(-1))	-0.369007	0.211120	-1.747855	0.0951
C	1014.849	9021.561	0.112492	0.9115
@TREND("1990")	929.2870	676.3610	1.373951	0.1839

R-squared	0.507471	Mean dependent var	2106.047
Adjusted R-squared	0.437110	S.D. dependent var	27510.94
S.E. of regression	20640.36	Akaike info criterion	22.85353
Sum squared resid	8.95E+09	Schwarz criterion	23.04855
Log likelihood	-281.6691	Hannan-Quinn criter.	22.90762
F-statistic	7.212369	Durbin-Watson stat	2.063635
Prob(F-statistic)	0.001654		

Null Hypothesis: D(FDIMANU) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.428081	0.0010
Test critical values:	1% level	-4.394309	
	5% level	-3.612199	
	10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDIMANU,2)

Method: Least Squares
Date: 06/26/18   Time: 16:10
Sample (adjusted): 1993 2016
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDIMANU(-1))	-2.286452	0.421227	-5.428081	0.0000
D(FDIMANU(-1),2)	0.381262	0.233054	1.635934	0.1175
C	-1629.240	10283.15	-0.158438	0.8757
@TREND("1990")	511.1921	658.0256	0.776857	0.4463

				-
R-squared	0.844043	Mean dependent var	313.2608	
Adjusted R-squared	0.820649	S.D. dependent var	50917.61	
S.E. of regression	21563.51	Akaike info criterion	22.94640	
Sum squared resid	9.30E+09	Schwarz criterion	23.14275	
Log likelihood	-271.3569	Hannan-Quinn criter.	22.99849	
F-statistic	36.08014	Durbin-Watson stat	1.968457	
Prob(F-statistic)	0.000000			

Null Hypothesis: FDISER has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.310318	0.0867
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDISER)
Method: Least Squares
Date: 06/26/18   Time: 16:11
Sample (adjusted): 1991 2016
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDISER(-1)	-0.628518	0.189866	-3.310318	0.0031
C	-104056.3	71378.89	-1.457802	0.1584
@TREND("1990")	16758.81	6297.796	2.661059	0.0140

R-squared	0.323745	Mean dependent var	17484.94
Adjusted R-squared	0.264940	S.D. dependent var	182991.7
S.E. of regression	156889.1	Akaike info criterion	26.87263
Sum squared resid	5.66E+11	Schwarz criterion	27.01780
Log likelihood	-346.3442	Hannan-Quinn criter.	26.91443
F-statistic	5.505417	Durbin-Watson stat	2.114574

Prob(F-statistic)   0.011124

Null Hypothesis: D(FDISER) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.891647	0.0303
Test critical values: 1% level		-4.440739	
5% level		-3.632896	
10% level		-3.254671	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDISER,2)
Method: Least Squares
Date: 06/26/18   Time: 16:11
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDISER(-1))	-4.445795	1.142394	-3.891647	0.0013
D(FDISER(-1),2)	2.757505	1.038203	2.656036	0.0173
D(FDISER(-2),2)	1.665563	0.722296	2.305928	0.0348
D(FDISER(-3),2)	1.398027	0.548606	2.548327	0.0215
C	-173911.3	111442.8	-1.560543	0.1382
@TREND("1990")	19810.09	8460.640	2.341441	0.0325

			-
R-squared	0.819028	Mean dependent var	3204.490
Adjusted R-squared	0.762474	S.D. dependent var	332844.8
S.E. of regression	162217.3	Akaike info criterion	27.05826
Sum squared resid	4.21E+11	Schwarz criterion	27.35582
Log likelihood	-291.6409	Hannan-Quinn criter.	27.12836
F-statistic	14.48229	Durbin-Watson stat	2.145030
Prob(F-statistic)	0.000019		