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**DETERMINANTS OF FOREIGN DIRECT INVESTMENT IN  
INDONESIA: NEW EVIDENCE FROM COINTEGRATION AND  
ERROR CORRECTION MODEL (ECM)**

**THESIS**



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FAKULTAS EKONOMI  
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PADANG  
2015**

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ANDALAS UNIVERSITY

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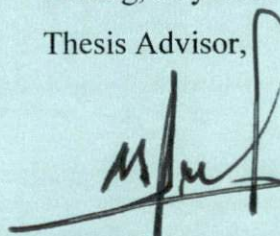
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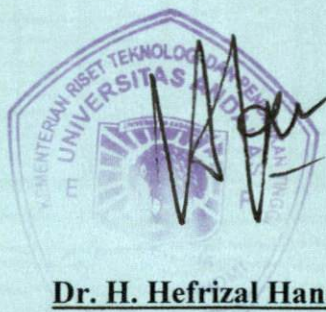
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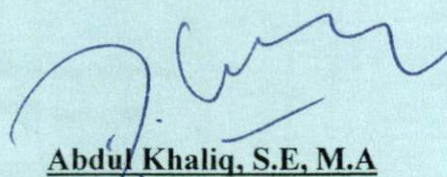
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# بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

*Dengan menyebut nama Allah yang Maha Pengasih lagi Maha Penyayang.*

*Tidak ada Tuhan melainkan Dia yang hidup kekal lagi terus menerus, tidak mengantuk dan tidak tidur. Kepunyaan-Nya apa yang di langit dan di bumi, tiada yang memberi syafa'at di sisi Allah tanpa izin-Nya. Allah mengetahui apa-apa yang di hadapan mereka dan di belakang mereka, dan mereka tidak mengetahui apa-apa dari ilmu Allah melainkan apa yang dikehendakinya. Kursi Allah meliputi langit dan bumi dan Allah tidak merasa berat memelihara keduanya, dan Allah Maha Tinggi lagi Maha Besar.*

**(QS. Al-Baqarah : 256)**

*Allah SWT tidak akan membebani seseorang melainkan sesuai dengan kemampuannya. (QS. Al Mu'minun:62)*

*Barang siapa menuntut ilmu, maka Allah akan memudahkan baginya jalan menuju surga.*

*Dan tidaklah berkumpul suatu kaum disalah satu dari rumah - rumah Allah Mereka membaca kitabullah dan saling mengajarkannya diantara mereka, kecuali akan turun kepada mereka ketenangan, diliputi dengan rahmah, dikelilingi oleh para malaikat, dan Allah akan menyebut – nyebut mereka kepada siapa saja yang ada disisi-Nya. Barang siapa nerlambat – lambat dalam amalannya , niscaya tidak akan bias dipercepat oleh nasabnya. (H.R Muslim dalam Shahih-nya)*

*'I consider that a man's brain originally is like a little empty attic, and you have to stock it with such furniture as you choose. A fool takes in all the lumber of every short that he comes across, so that the knowledge which might be useful to him gets crowded out, or at best is jumbled up with a lot of other things, so that he has a difficulty in laying his hands on it. Now the skillful workman is very careful indeed as to what he takes into his brain-attic. He will have nothing but the tools which may help him in doing his work, but of these he has a large assortment, and all in the most perfect order. It is a mistake to think that little room has elastic walls and can distend to any extent. Depend on it – there comes a time when for every addition of knowledge you forget something that you knew before. It is of the highest importance, therefore , not to have useless facts elbowing out the useful ones.'* (Sherlock Holmes)

## LETTER OF STATEMENT

I would like to state that my thesis with title “**Determinants of Foreign Direct Investment in Indonesia : New Evidence from Cointegration and Error Correction Model (ECM)**” is worked by myself and there is no part or all of the posts that contain the phrase, idea, or opinion from another source without giving acknowledgment to the original author. As the parts are sourced from other people's work have included the source in accordance with the norms, ethics and rules of scientific writing. If they find a plagiarism in this thesis, I am willing to accept the sanction of revocation of academic degrees that I have gained.

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The giver of statement



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**Determinants of Foreign Direct Investment in Indonesia :**

**New Evidence from Cointegration and Error Correction Model (ECM)**

Thesis by: **Beni Ade Gunawan**

Thesis Advisor by: **Drs. H. Masrizal, M.soc.Sc**

**ABSTRACT**

Foreign direct investment is one of the alternative financing comes from abroad that can be used as additional financing in economic development in Indonesia. The aim of this research is for analyzing the effect of GDP, BI rate, inflation, and openness on foreign direct investment in Indonesia during 2000-2014. This research using the secondary data and cointegration and Error Correction Model (ECM) method. From the results of the research show that openness have no significant influence on foreign direct investment in Indonesia, but GDP, inflation, and BI rate has a significant effect on foreign direct investment in Indonesia, with  $\alpha=5\%$ . Inflation and BI rate has a negative effect in short term while gross domestic product have a positive effect in long term to foreign direct investment in Indonesia. Central Bank and Government policy take important role to attract foreign direct investment inflow in Indonesia.

**Keywords: Foreign direct invesment, GDP, BI rate, Inflation, Opennes, Cointegration and ECM**

This thesis has been presented before the examiners in the thesis examination and successfully passed the thesis examination on July 06<sup>th</sup>, 2015.

The abstract has been approved by the advisor and examiners:

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## PREFACE

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All praise to be on Allah SWT, Lord of the world. The writer would like thanks to Allah SWT for its guidance and mercy therefore my thesis entitled “**Determinants of Foreign Direct Investment in Indonesia : New Evidence from Cointegration and Error Correction Model (ECM)**” has finally been accomplished on time without matter problem. This thesis is submitted as a partial requirement to acquire Bachelor Degree at Economics Department of Economics Faculty of Andalas University.

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# CHAPTER I

## INTRODUCTION

### 1.1 Background

Development efforts undertaken by developing countries generally oriented in how to fix or improve living standards, it is necessary to accelerate the economic development of large capital. But, the lack of capital in a country will lead to low productivity of the economy resulting in the low income received by the community. Furthermore, the low income limitations will affect the savings required in subsequent period investment activities.

The Characteristic of under developed countries is "less capital" or "low savings" and "low investment", not only supplies very little capital but also the rate of capital formation is very low money. Scarcity of capital instruments are another common characteristic of underdeveloped countries is defined as an economy that "capital poor" or the "low savings and investment", not only supplies very little capital but capital accumulation levels were very low. Gross investment is only around 5% to 6% of gross national income, whereas in industrialized countries is approximately 15% to 20%.

The low rate of savings as it was not nearly enough to deal with the rapid population growth rate of 2% to 2.5% per year, let alone invest in new capital projects. The accumulation of capital is indispensable for the creation of an investment climate that aims for the country's economic development, if there are a lot of investment it is expected that economic activity and output also increased. Therefore, the government seeking development funds from abroad by foreign direct investment.

Indonesia is one of developing countries which require substantial funding to carry out its economic development. Depending only on domestic funds is considered as not sufficient to fulfill the development needs. This is due to the amount of domestic savings which is still lack for fulfilling the required investments. As pointed out by Goeltom (2008) that domestic savings as the main source of financing development are usually inadequate for the scale of investment development required. Therefore, due to the limitations of domestic funds, the government to increases the amount of financing from foreign.

Foreign financing source can be divided into foreign debt and foreign investment. Foreign debt and foreign investment, they cannot be used individually but rather they have to be used as complementary, that is complementing each other's weaknesses. But, if the accumulation of foreign debt has already been so large, then it may become a burden for state budget in the future. Imagine, if the government is in a state of continuously using foreign financing in the form of debt, then this may lead to the accumulation of debt in long term which will eventually become a burden to the state budget, because the obligation to repay the debt principal and interest.

Thus government policy should be directed to gradually be able to maintain the health level in using foreign debt and reduce the dependency of using foreign debt excessively. Hence, one alternative that allows the Government to obtain a source of development funds is to increase the foreign investments, which can be obtained from FDI.

The effect foreign direct investment began when a company from one country to invest in the long term to a company in another country. In this way companies are there in the country of origin (home country) could control the company's investment in the destination country (host country) either partially or completely. The trick begins where investors buy companies abroad that already exist, providing capital to build a new company there or buying 10%.

According to OECD journal (2011) while foreign direct investment and multinational enterprises (MNEs) are often received to be beneficial for local developments. They have also aroused much controversy and social concern. For example, MNEs have often been accused of taking unfair advantages of low wages and weak labor standards in developing countries. In Indonesia there some Multi-national company such as PT Astra International Tbk, PT Unilever Indonesia Tbk, Freeport, Coca-Cola, Chevron cooperation and other.

Based on central Bank of Indonesia data, the trend of Foreign Direct Investment (FDI) in Indonesia over quarterly period 2000 until 2014 is fluctuate. The foreign direct investment data show that in the beginning 2000 Indonesia attract foreign direct investment about 2,680 million rupiah and the end 2014 the trend of foreign direct investment 46,580 million rupiah. Its show that increasing foreign direct investment in Indonesia from first quarter 2000 until the last quarterly 2014 around 9.3%, and it mean that foreign direct investment likely has increasing trend in that period.

According to the bureau of statistics Indonesia data, the trend of gross domestic product (GDP) also has fluctuate trend but more likely to increase over quarterly period 2000 until 2014. The data show that gross domestic product at

first quarterly period 324,232.0 billion rupiah and at the end quarterly period in 2014 gross domestic product Indonesia 2,690,240.9 billion rupiah. It probably has correlation and contribution to attract foreign direct investment in Indonesia.

The trend of Inflation in Indonesia probably has contribute to attract foreign direct investment in Indonesia. It cause based on statistic Indonesia show that inflation in Indonesia over quarterly period 2000 until 2014 also tends to fluctuate. In 2000 inflation rate recorded about 7.0%, then arise become 8.3% in third and last quarterly in 2000. But in end quarterly period 2014 the trend of inflation data show that inflation at 6.5%. the data show that fluctuate trend inflation in Indonesia over quarterly period will lead to consider investment cost that would stimulate foreign investment in the country.

Central bank of Indonesia data show that BI rate in Indonesia over quarterly period 2000 until 2014 is fluctuate. It can see by changing rate of BI rate at that period. At during quarter 2000 – 2001 in term of economic recovery from crises, BI rate Indonesia recorded tends to increase in first quarter until last quarter 2001 from 11.0% until 17.6%, and then after that BI rate tend to decrease to 9.1% in the third quarter in 2005. It show that fluctuate of BI rate data probably indicated influence to attract foreign direct investment.

Another factor that indicated to attract foreign direct investment in Indonesia over quarterly period in 2000 until is openness. Some policies on trade openness might cause a significant impact on attracting foreign direct investment. Openness data in Indonesia over quarterly period in 2000 until 2014 show that it fluctuated data. So cause of that, the writer assumption openness also indicated to attract foreign direct investment in Indonesia.

Foreign Direct Investment (FDI) is believed to be one of the important sources developing countries, it's including Indonesia. The presence of FDI is expected to make a major contribution to development through the transfer of assets, technology and managerial skills to boost economic growth. Based on data and explanation before, This research want to know the factors that significant influence to determinants of foreign direct investment in Indonesia over quarterly period 2000 to 2014. So, the problems associated with the above, writer is interested in analyzing short term and long term period variables that attract Foreign Direct Investment in Indonesia with title:

**“Determinants of Foreign Direct Investment in Indonesia: New  
Evidence From Cointegration and Error Correction Model  
(ECM)“**

## 1.2 Research Problem

According to data of Indonesian on World Investment Reports statistic, Foreign Direct Investment in Indonesia as a percentage of gross fixed capital formation become unstable by year, it can be happen because many factors that influence this condition, as we know as potential of Indonesia has good condition to be a better nation on the future, according this phenomenon the author will simply know what kind of factor that significantly give effects to Foreign direct investment in Indonesia in the short and long period.

The macroeconomics of Indonesian threatened one of the cause of foreign direct investment inflow to Indonesia, gross domestic product, inflation, BI rate openness, and etc are variables which give influence to foreign direct investment inflow to Indonesia. As we know, foreign direct investment is one of factor that focus to continue to develop economics in the country. so, to develop our country the best way is to attract foreign direct investment in Indonesia.

Based on the literature review about this study before we know that the result suggest that openness, the quality of labor force, openness and macroeconomic stability have been influential in attracting Foreign direct investment in the long run, while in the short-run it is quality of infrastructure that's has been instrumental. Moreover, subject to availability of data, the model may need to be extend to include inflation and BI rate. That's why writer interested to analyze the determinant foreign direct investment by gross domestic product, bi rate, inflation, and openness variable in Indonesia.

Based on the background problem above that problem is how many factors impact of gross domestic product, bi rate, inflation, and openness on foreign direct investment in Indonesia during period 2000 – 2014 in which macroeconomic variables are dominant factors determinant of foreign direct investment in Indonesia. Thus, government should take the policy with the aim of creating a good condition to attract foreign direct investment to invest in Indonesia.

### **1.3. Research Questions**

1. What is the impact of gross domestic product on foreign direct investment in Indonesia?
2. What is the impact of BI rate on foreign direct investment in Indonesia?
3. What is the impact of inflation on foreign direct investment in Indonesia?
4. What is the impact of openness on foreign direct investment in Indonesia?

### **1.4. Research objective**

Based on the research problem, the writer want to analyse it, then the basic purpose of this study is

1. Analyse the impact gross domestic product on Foreign Direct Investment in Indonesia during quarterly period 2000 until 2014.
2. Analyse the impact BI rate on Foreign Direct Investment in Indonesia during quarterly period 2000 until 2014.
3. Analyse the impact inflation on Foreign Direct Investment in Indonesia during quarterly period 2000 until 2014.

4. Analyse the impact openness on Foreign Direct Investment in Indonesia during quarterly period 2000 until 2014.

### **1.5. Research Advantages**

This study is expected to be useful for writer and other interested parties.

As for the benefits of this research include:

1. As the partial fulfillment of Bachelor of Economics in Economic Faculty, Andalas University.
2. For the writer, improving my ability in writing report and doing research, especially in monetary sector.
3. For the reader is expected to add understanding regarding the economic analysis about the context of foreign direct investment and factors that can be impact the foreign direct investment such as gross domestic product, BI rate, inflation and openness.
4. For the investor is expected to provide a new discourse in considering those aspects that need to be taken into account in investment that are not solely rely on monetary measures.
5. For researcher in the field of economics and finance is expected this study can be a reference for the next research.
6. For society will provide a proactive stimulus as a controller of economics and increase public awareness to reach stability of economic growth.
7. For government will be recommended to take better policy about attract foreign direct investment and other indicators, how to handle of gross domestic product, BI rate, inflation and openness.

## **1.6. Scope of Research**

Given the complexity of the problem or scope of discussion to simplify and make more focused writer hence the need for restriction, that are:

1. Analyses the determinants of foreign direct investment in Indonesia started from 2000 until 2014.
2. Foreign direct investment seen at foreign direct investment inflow.
3. Meanwhile variables that influence or effect foreign direct investment in this research are gross domestic product (GDP), BI rate, inflation and openness.
4. Openness seen at export (X) plus import (M) over gross domestic product (GDP), BI rate seen at percentage of interest rate bank of Indonesia, and inflation where seen at percentage of inflation.

## **1.7. Writing Systematic**

Systematic writing of this study is divided into six chapters. As for each chapter are briefly described as follows:

### **Chapter I: Introduction**

This chapter contains description of the background of the foreign direct investment in Indonesia. Theoretically and study case foreign direct investment influenced by macroeconomic variables such as gross domestic product (GDP), BI rate, inflation and openness. This chapter also describes about problem identification, research questions, research objectives, the research advantage, the scope of research, and writing systematic.

## **Chapter II: Theoretical Framework and Literature Review**

This chapter will provide the foreign direct investment theory and the relationship between foreign direct investment and economic variables such as gross domestic product (GDP), BI rate, inflation and openness. To support the literature review some explanation from empirical studies in the past, as proven.

## **Chapter III: Research Methodology**

This chapter elaborates about study method of problem, containing research data such as research variables, data characteristics, population that accompanied by clarification about data collecting procedure, and also technique data analysis.

## **Chapter IV: General Overview**

This chapter describes the overview of research object, such as overview about trend of foreign direct investment, gross domestic product (GDP), BI rate, inflation and openness in Indonesia.

## **Chapter V: Empirical Results and Analysis**

This chapter discusses more about the study description contains a description of the research object, data analysis, interpretation and discussion of the result obtained from the study.

## **Chapter VI: Conclusions and Recommendations**

This chapter consists of conclusion of the study and implication on the future research.

## CHAPTER II

### THEORETICAL FRAMEWORK AND LITERATURE REVIEW

#### 2.1 Theoretical Framework

Generally, economics divided into two parts are microeconomics and macroeconomics. Microeconomics theory explains economic activity of economic agents individually such as household, company to interact and allocate available resources. Meanwhile macroeconomics theory is part of economics that studies the economy as whole (aggregate); where macroeconomic explain the relationship between variables in a system of economic aggregates such as consumption, export, import, and investment. Macroeconomics is an imperfect science, but science is useful to explain economic phenomena and how economic policy (Mankiw, 2007).

##### 2.1.1 The Definition of Foreign Direct Investment

According to Krugman (2004) is the international capital flows, Foreign direct investment is from a country where companies establish or expand his company in another country. Therefore, not only the transfer of resources, but it also happens to control the implementation of overseas companies. Foreign direct investment is an important feature of an increasingly globalized economic system. It began when a company from one country to invest in the long term to a company in another country. In this way companies are there in the country of origin (so-called 'home country') could control the company's existing investment in the destination country (commonly called the 'host country ') either partially or

completely. The trick with the investors to buy overseas companies that already exist or provide capital to build a new one or buying 10 %.

According to OECD journal (2011) explained that Foreign direct investment is more important in ensuring continuity develop compared with aid or portfolio capital flows, the cause of Foreign direct investment in a country will be followed by the transfer of technology, know-how, management skills, business risk is relatively small and more profitable. And he mentioned that more than 80% of private capital and 75% of the Foreign direct investment flows since 2000 to countries with medium income ( middle income countries ). For Asia around 60 % and Latin America by 20 %.

Wei and Liu (2001) estimates that foreign investment in developing countries will grow at a rate of 7-10 % per year until the end of the decade. This was driven by the impact of liberalization, privatization, technological innovation, reduction in transportation costs, telecommunications, capital mobility and financial integration growth. In its annual report, UNCTAD (2001), World Investment Report, suggests that the growth of FDI worldwide has increased significantly since 1990, 1997 and 2000, which respectively USD 209 million, USD 437 million and USD 1,118 million.

Foreign direct investment typically associated with investments in productive assets, such as the purchase or construction of a factory, purchase of land, equipment or buildings or construction equipment or building a new one that is made by a foreign company. Replanting capital ( reinvestment ) of the company's revenue and the provision of short-and long -term loans between the

parent company and its subsidiaries or affiliates are also classified as direct investment. Now developing new motifs in Foreign direct investment as licensing the use of high technology.

Most Foreign direct investment is full or nearly full ownership of a company. This includes enterprises owned jointly (joint ventures) and strategic alliances with local companies. Joint ventures involving three parties or more commonly called syndication (or ' Syndicates ') and normally formed for specific projects such as large construction or public works projects that involve a wide variety of expertise and resources. Foreign Investment Law ( Law no. 1/1967 ) issued to attract foreign investment to build a better country. in Indonesian economy is the authority of the Investment Coordinating Board (BKPM) to give approval for foreign direct investment.

### **2.1.2 Objective FDI ( Foreign Direct Investment )**

The purpose of each of Foreign direct investment is not the same, the company investors moved by various reasons to invest abroad. They have decision-making process and the different priorities -the difference when choosing a location for investment. There are four main objectives of Foreign direct investment, namely :

1. Search resources,
2. Search market,
3. Search efficiency, and
4. Asset search strategies.

Foreign direct investment can provide a variety of economic and other benefits to the host location, the benefits include increasing employment, increasing income, beneficial impacts to local investment, transfer of technology, the improvement of labor skills, increasing exports, improving the competitiveness of the international from local companies and increasing competition domestic.

Foreign direct investment now plays an important role in the internationalization of business. Profound changes have taken place both in terms of size, scope, and methods of Foreign direct investment in the last decade. These changes occur because of developments in technology, easing of restrictions on foreign investments and acquisitions in many countries, and the deregulation and privatization of many industries. The development of information technology systems and cheap global communication enables management of foreign investments much easier.

Governments pay attention to Foreign direct investment for investment flows into and out of the country they can have a significant impact. Economists consider Foreign direct investment as a driver of economic growth as it contributes to national economic measures such as Gross Domestic Product (GDP), Gross Fixed Capital Formation (total investment in the economy of the host country) and the balance of payments. They also argue that Foreign direct investment promotes development because the host country or company that receives the investment, it can be a source of new technologies , processes , products, organizational systems, and management skills. Further, Foreign direct investment is also open markets and marketing channels for the company 's new,

cheaper production facilities and access to technology, products, skills and financing.

### **2.1.3 Motive Foreign Investment**

According to Varma (2006) in her research explained strategic logic of FDI as motivation of foreign investors to invest its capital in the form of FDI, namely:

- 1) Resource seeking FDI attempts to acquire particular resources at a lower real cost than it could be obtained in the home country. Resource seekers can be further classified into three groups: those seeking physical resources; those seeking cheap and/or skilled labor; and those seeking technological, organizational, and managerial skills.
- 2) Market-seeking FDI attempts to secure market share and sales growth in the target foreign market. This strategy can be conducted as a defense strategy. Investment in the background above is used to find markets that are realized in the form of mergers and acquisitions.
- 3) Efficiency-seeking FDI attempts to rationalize the structure of established resource-based or marketing-seeking investment in such a way that the firm can gain from the common governance of geographically dispersed activities. MNEs with this motive generally aim to take advantage of different factor endowments, cultures, economic systems and policies, and market structures by concentrating production in a limited number of locations to supply multiple markets.

4) Strategic asset-seeking FDI attempts to acquire the assets of foreign firms to promote their long-term strategic objectives, especially advancing their international competitiveness. MNCs with this intention often establish global strategic alliances or acquire local firms.

There are several motives why the strategy of firms investing abroad.

Motives include:

1. *Motive market*; companies investing abroad was initially driven by the desire to get additional revenue by supplying goods production to new markets.
2. *Motive search for raw materials*; these motifs into the second motif dominant. Categories of raw materials include oil , mining goods and forest products.
3. *Motive production efficiency*; do in this country that has more low cost production factor relative to other countries.
4. *Skill motive technology and management* with operations in foreign countries such as the German company, the Netherlands, Japan.
5. *Security political motive*.

Five motifs above is not a relationship of mutual erase, but more important is whether the overseas investment is a form of proactive or defensive investment. Proactive investment is designed for improving the growth and profitability of the company, while defensive investment done to protect the company's position in the competition.

In deciding to invest abroad, the manager must ensure that the company has an advantage that allows it to compete on the local market ( home market ). The competitive advantage should be a specific form of the company, can be moved and strong enough to replace possibility of the risk of overseas operations.

There are many forms of competitive advantage to company can survive in both local and overseas markets. These advantages is the presence of economies of scale, scope economical, managerial and marketing expertise, technological excellence, financial strength, product differentiation and competitive domestic market. After the election of the investment area can be done by doing the investment opportunities in various countries. Then selected the top ranking countries. Criteria for determining the ranking can be done by various categories with the decision-maker priorities. Motive in consideration of strategic behavior can be influenced by external environmental stimuli and individual commitment to a group premises. To countries where investments should be made, decisions about which countries to invest abroad to do is influenced by economic factors and behavior. The decision to invest abroad is also not the first time together with the decision to air- reinvestment.

Companies need to identify the advantages that they have and then look for an imperfect market where companies can enjoy and enhance their competitive advantage. Companies often have to follow the steps described in the theory of corporate behavior. But often times the rational ability to process and analyze all the information to make a perfect decision do deadlock.

International investment location have significance for international companies. To determine the location of foreign investment , need to consider carefully the various terms as follows :

1. The level of development of domestic companies in elementary dank the economy that require diversification of the market not only in domestic.
2. Comparative advantage and competitive advantage of the company. This competitive advantage in locations where there is a tie with market imperfections and the company can produce a rate of return that is quite interesting .
3. Application of behavioral theory expressed in process internalization theory (internalization process theory) and the theory of international labor relations (international network theory).

## **2.1.4 Theories of Foreign Direct Investment**

### **2.1.4.1 Production Cycle Theory of Vernon**

Production cycle theory developed by Vernon in 1966 was used to explain certain types of foreign direct investment made by U.S. companies in Western Europe after the Second World War in the manufacturing industry. Vernon believes that there are four stages of production cycle: innovation, growth, maturity and decline. According to Vernon, in the first stage the U.S. transnational companies create new innovative products for local consumption and export the surplus in order to serve also the foreign markets. According to the theory of the

production cycle, after the Second World War in Europe has increased demand for manufactured products like those produced in USA.

Thus, American firms began to export, having the advantage of technology on international competitors. If in the first stage of the production cycle, manufacturers have an advantage by possessing new technologies, as the product develops also the technology becomes known. Manufacturers will standardize the product, but there will be companies that you will copy it. Thereby, European firms have started imitating American products that U.S. firms were exporting to these countries. US companies were forced to perform production facilities on the local markets to maintain their market shares in those areas. This theory managed to explain certain types of investments in Europe Western made by U.S. companies between 1950-1970. Although there are areas where Americans have not possessed the technological advantage and foreign direct investments were made during that period.

#### **2.1.4.2 The Theory of Exchange Rates on Imperfect Capital Markets**

This is another theory which tried to explain Foreign direct investment. Initially the foreign exchange risk has been analyzed from the perspective of international trade. Itagaki (1981) and Cushman (1985) analyzed the influence of uncertainty as a factor of Foreign direct investment. In the only empirical analysis made so far, Cushman shows that real exchange rate increase stimulated Foreign direct investment made by USD, while a foreign currency appreciation has reduced American Foreign direct investment. Cushman concludes that the dollar appreciation has led to a reduction in U.S. Foreign direct investment by 25%.

However, currency risk rate theory cannot explain simultaneous foreign direct investment between countries with different currencies. The sustainers argue that such investments are made in different times, but there are enough cases that contradict these claims.

#### **2.1.4.3 The Internalisation Theory**

This theory tries to explain the growth of transnational companies and their motivations for achieving foreign direct investment. The theory was developed by Buckley and Casson, in 1976 and then by Hennart, in 1982 and Casson, in 1983. Initially, the theory was launched by Coase in 1937 in a national context and Hymer in 1976 in an international context. In his Doctoral Dissertation, Hymer identified two major determinants of Foreign direct investment. One was the removal of competition. The other was the advantages which some firms possess in a particular activity (Hymer, 1976). Buckley and Casson, who founded the theory demonstrates that transnational companies are organizing their internal activities so as to develop specific advantages, which then to be exploited. Internalisation theory is considered very important also by Dunning, who uses it in the eclectic theory, but also argues that this explains only part of Foreign direct investment flows.

Hennart (1982) develops the idea of internalization by developing models between the two types of integration: vertical and horizontal. Hymer is the author of the concept of firm-specific advantages and demonstrates that Foreign direct investment take place only if the benefits of exploiting firm-specific advantages outweigh the relative costs of the operations abroad. According to Hymer (1976) the MNE appears due to the market imperfections that led to a divergence from

perfect competition in the final product market. Hymer has discussed the problem of information costs for foreign firms respected to local firms, different treatment of governments, currency risk. The result meant the same conclusion: transnational companies face some adjustment costs when the investments are made abroad. Hymer recognized that Foreign direct investment is a firm-level strategy decision rather than a capital-market financial decision.

#### **2.1.4.4 The Eclectic Paradigm of Dunning**

The eclectic theory developed by professor Dunning is a mix of three different theories of direct foreign investments (O-L-I):

a. "O" from Ownership advantages:

This refer to intangible assets, which are, at least for a while exclusive possesses of the company and may be transferred within transnational companies at low costs, leading either to higher incomes or reduced costs. But TNCs operations performed in different countries face some additional costs.

Thereby to successfully enter a foreign market, a company must have certain characteristics that would triumph over operating costs on a foreign market. These advantages are the property competences or the specific benefits of the company. The firm has a monopoly over its own specific advantages and using them abroad leads to higher marginal profitability or lower marginal cost than other competitors.

There are three types of specific advantages :

a) Monopoly advantages in the form of privileged access to markets through ownership of natural limited resources, patents, trademarks;

b) Technology, knowledge broadly defined so as to contain all forms of innovation activities

c) Economies of large size such as economies of learning, economies of scale and scope, greater access to financial capital;

b. "L" from Location:

When the first condition is fulfilled, it must be more advantageous for the company that owns them to use them itself rather than sell them or rent them to foreign firms. Location advantages of different countries are de key factors to determining who will become host countries for the activities of the transnational corporations.

The specific advantages of each country can be divided into three categories :

a) The economic benefits consist of quantitative and qualitative factors of production, costs of transport, telecommunications, market size etc.

b) Political advantages: common and specific government policies that affect Foreign direct investment flows

c) Social advantages: includes distance between the home and home countries, cultural diversity, attitude towards strangers etc.

c. "I" from Internalisation:

Supposing the first two conditions are met, it must be profitable for the company the use of these advantages, in collaboration with at least some factors outside the country of origin. This third characteristic of the eclectic paradigm OLI offers a framework for assessing different ways in which the company will exploit its powers from the sale of goods and services to various agreements that might be signed between the companies.

As cross-border market Internalisation benefits is higher the more the firm will want to engage in foreign production rather than offering this right under license, franchise. Eclectic paradigm OLI shows that OLI parameters are different from company to company and depend on context and reflect the economic, political, social characteristics of the host country. Therefore the objectives and strategies of the firms, the magnitude and pattern of production will depend on the challenges and opportunities offered by different types of countries.

The strong growth of international trade and foreign direct investment (FDI) that we have witnessed in the past few decades has inspiring extensive research on the behavior of multinational firms and determinants of FDI. Many authors have concentrated on the issue of FDI determinants and put forward various (and complementary) theories to explain them.

According to Assuncao (2011) there is summary of theories for foreign direct investment from 1933 until 2002, the theoretically approach by Heckscher-Ohlin Model / MacDougall-Kemp Model, Market imperfections, Product differentiation, Oligopoly markets, Product life cycle Production, Behavior theory, Internalization, Eclectic paradigm (OLI – Ownership, location, internalization), New theory of trade, and Institutional approach.

## **2.2 Relationship between Economic Variables**

### **2.2.1 Relationship between Gross Domestic Product and FDI**

According to Dhakal et.al (2007), GDP could be described as the size of the market. By analyzing the size of the market, it suggests that investment will go mainly to market which is quite large to be able to support the scale of economy that is needed for the production of the company.

Kiat (2008) stated that the economic growth was one of the early signs for investors to consider its investments in a particular country. Furthermore, according to Nonnemberg & Cardoso (2004), strong GDP growth could increase the flow of FDI inflow, but a country is required to have good infrastructure capacity in order to take advantage of the FDI. Strong economic growth implies a higher return for foreign investors by the increased investment grade in economy.

It is argued that characteristics of host countries such as market size, market growth, stage of development, and the presence of local competition will influence decisions to invest abroad. The level of Foreign direct investment is positively related to the absolute size of a foreign market, which is also regarded as gross domestic product hypothesis. Empirical work has generally supported the hypotheses that both host gross domestic product variables have significant positive effects on Foreign direct investment, with the gross domestic product hypothesis supported more strongly.

### **2.2.2 Relationship between Inflation and FDI**

Inflation is one of the indicators that can describe the level of economic stability in a country. High inflation rate shows internal economic instability, it implies that country's Government is unable to balance the economy and central

bank is fail in conducting an appropriate monetary policy. Due to high inflation rate, companies face uncertainty in terms of the prices of products and the price of inputs. Therefore, in these circumstances, multinational companies will avoid or reduce investment in countries that have high inflation rate (Dhakal, et al. 2007).

According to Sri Muwarni (2010) Inflation is the most influence independent variable to attract Foreign Direct Indonesia than interest rate and exchange rate in Indonesia. An economic instability can be a big barrier to the flow of FDI. Any form of instability can make investors distort their perceptions of future profitability in a country. When inflation increases in a country, it will make the price of goods and services become more expensive, so that the cost of inputs (raw materials and labor costs) of production will be increased. This condition can force business players to increase the price of output that results to lower competitiveness level. In addition, inflation can also lead to low purchasing power, and demand for goods and services will decrease, which is ended in sluggish trading activity and hence the investors will be difficult to generate profit. This matter can reduce the interest of investor to invest its capital in the country.

So, the effect of inflation on investment activity has a negative correlation, where high rates of inflation will reduce the level of investment because of the high cost of the investment itself. In contrast, a low inflation rate will lead to lower investment costs that would stimulate foreign investment in the country.

### **2.2.3 Relationship between BI rate and FDI**

The interest rate is the price that must be paid for the use of money for a specified period, usually expressed in percent (%). In theory, when interest rates

go down, the cost of the investment will also go down, so that the company will increase its investment by purchasing capital goods, such as machinery, equipment, and so on. Are common in the literature that the interest rate has a negative correlation with the interest to invest. According to Sukirno (2002), the investment will be made by the investor if the rate of return on capital greater than or equal to the interest rate. If the interest rate is greater than the rate of return on capital, planned investment is not profitable, and therefore the investment will not be made by the investor.

Interest rates may also affect the demand on the composition of the foreign direct investment. Mishkin (2007), mentions that there are several determinants of the demand for an asset :

1. Wealth, the total of the resources owned by individuals, as well as all assets. Demand for assets is positively related to one's prosperity. The more prosperous a person, then the demand for assets with the aim of diversifying the risk will be higher.
2. Expected Return, the return of investments in the coming period relative to other alternative assets. Remuneration expectations of a interest rate in the future. The higher the interest rate of the asset, prosperity investor also will increase. If the interest rate in the future is higher than the current interest rate, the demand for assets in the present will be reduced. By contrast, in the future demand for assets will be greater.
3. Risk, the degree of uncertainty of the value of remuneration on an asset relative to other alternatives. Demand for assets negatively associated with risk assets to remuneration relative to other alternative assets.

4. Liquidity, the ease and speed of an asset can be converted into cash relative to other alternative assets. Demand for liquidity assets is positively related to these assets.

According to Chow (2008), said that the increase in capital flows to Asia in recent years due to low interest rates in developed countries, while investors look for investments that generate high yields. Lozovyi & Kudina (2007), suggests that high interest rates in the country of destination can attract investors in the form of a portfolio, while rising interest rates offered by other countries tend to lower capital inflows in the form of a portfolio. So that the influence exerted by interest rates on foreign portfolio investment is inversely proportional to its effect on foreign direct investment.

#### **2.2.4 Relationship between Openness and FDI**

Openness is defined as an economy which trades with the rest of the world. In other words, there exist economic activities such as import and export for a country. Countries like the ASEAN members who practice foreign trade are known open economies. Openness can be measured as follows:

$$\text{Openness} = (\text{total export} + \text{total import}) / \text{total GDP}$$

Economic openness brings many advantages such as consumers have plenty of choices since there are variety of goods and services in the economy. Moreover, the country's citizens have the opportunity to invest their savings abroad. Furthermore, open economy appears to be beneficial for regional development, at the same time indirectly reducing poverty among citizens.

Trade openness is a significant factor affecting FDI inflows. Theoretically, trade restrictions or openness could affect FDI inflows positively or negatively.

Some policies on trade openness might cause a significant impact on attracting FDI. For example, through the implementation of free trade agreements (FTA), several Latin American countries have been able to attract greater flows of FDI. ( Seim 2009) stated that FDI fosters exports, import substitution, or greater trade in intermediary inputs.

There are studies which have found a positive relationship between trade openness and FDI flows (Biglaiser and deRouen 2006; Chakrabarti 2001). On the other hand, ( Seim 2009) find a negative relationship between FDI inflows and the degree of openness for countries in transition. In other words, the relationship between trade openness and FDI inflows is very complex, needs careful explanation and may depend on the characteristics of each case. Theoretically, the effect of trade openness on FDI inflow varies depending on the motivation for engaging in FDI activities (Markusen and Maskus 2002).

### **2.3 Literature Review**

According to Madura (2008) commonly capitalize foreign business opportunities by engaging in FDI, which is investment in real assets (such as land, buildings, or even existing plants) in foreign countries. FDI can also be known as supervised foreign long-term investments, it means that the investors directly supervise capital flow in the importing country. Supervision can be done by setting up a branch of the company, establishing a company whose share majority-owned by investors or by storing the fixed assets in the importing country. Krugman, Obstfeld, and Melitz (2004) define FDI as a firm largely

owned by foreign residents acquiring or expanding a subsidiary firm or factory located in the host developing country.

One prominent attribute of FDI is that it involves not only the transfer of resources, but also imposes foreign control, which means a branch or subsidiary is not only strapped by financial obligations to parent company but also has a role as a part of the whole organizational structure of parent company. So company's subsidiary or branch is an extension of the parent company in the country of origin.

In macro-level theory of FDI, the level of profit generated by an investment leads to the trend of the occurrence of competition in the domestic investment climate of a country. It would encourage investors to engage in FDI by transferring production facilities to countries that have lack of capital and low investment costs to boost overall profit (Straker, 2000).

Krugman, Obstfeld, and Melitz (2004) identified four different categories of FDI. First category is when a multinational firm builds a new production facility or creates a new firm in a foreign country, it is known as Greenfield FDI. Second category is known as Brownfield FDI which is denoted as the acquisition or merger by a multinational firm with an already existing firm. While Greenfield FDI implies full ownership of the multinational affiliates, Brownfield FDI can involve either full or only partial ownership of the multinational affiliates. The other two categories of FDI are horizontal FDI and vertical FDI.

Horizontal FDI occurs when the affiliate replicates the production process (that the parent firm undertakes in its domestic facilities) elsewhere in the world. While vertical FDI occurs when the production chain is separated, and parts of the

production processes are transferred to the affiliate location (Krugman, Obstfeld, and Melitz: 2004). Both horizontal FDI and vertical FDI are driven by an attempt to reduce costs of the multinational firms. Horizontal FDI takes place to reduce the costs of international trade such as transportation costs, tariffs, and quota controls by having the final production facility located in the foreign country. Vertical FDI is driven by the theory of comparative advantage.

Under the efficiency-seeking determinant, there is another factor which may play a role in selecting Foreign direct investment flow to developing countries. One possible determinant of Foreign direct investment would be the geographical distance between donor and recipient countries (Asiedu, E. 2002).

Three factors made significant contributions to the high rates of investment. First, as discussed earlier, macroeconomic stability and export-oriented government policies provided investment-friendly environments. With the protection of private property rights, the business sector did not hesitate to reinvest their profits. Second, successful export performance and government's preferential treatment of credit allocation to export-oriented industries enabled high rates of investment (Benassy-Quere, et al. 2001). Third, a moderate repression of interest rates increased investment by transferring income from household to firms (Campos, N. F. & Kinoshita, Y. 2002).

Existing studies of foreign direct investment in Indonesia have focused on one of a few specific issues. There are studies of bureaucratic impediments to doing business in Indonesia (McLeod 2006); the effect of foreign direct investment on wages (Lipsey&Sjoholm 2004; Takii &Ramstetter 2005; Sjoholm&Lipsey 2006) and technology transfer and productivity spillovers

between multinational enterprises and local firms in Indonesia (see e.g. Takii 2005; Lee & Tan 2006; Todo & Miyamoto 2006). There are also studies of the relationship between foreign direct investment and economic growth (Asafu-Adjaye 2000; Marwah & Tavakoli 2004; Khaliq & Noy 2007) and the determinants of foreign direct investment in Indonesia (Evrensel & Kutan 2007).

Separate from the literature on various aspects of foreign direct investment in Indonesia, there are studies of Indonesia's legal system including the extent of bribery and corruption. Most studies of Indonesia's legal system and law reform in Indonesia have been descriptive (see e.g. Lindsey 2004; Juwana 2005). Some exceptions are Kuncoro (2004, 2006) who examines the determinants of bribery in Indonesia based on 'Cost of Doing Business Surveys' administered by the University of Indonesia and Olken (2007) who presents the results of a randomized field experiment on reducing corruption in over 600 Indonesian village road projects. There are, however, no computable general equilibrium-based studies of foreign direct investment or law reform in Indonesia.

According to Nonnemberg & Cardoso (2004), conducted a study on the impact GDP to Foreign Direct Investment find that positive correlation about GDP and FDI. Strong GDP growth could increase the flow of FDI inflow, but a country is required to have good infrastructure capacity in order to take advantage of the FDI. Strong economic growth implies a higher return for foreign investors by the increased investment grade in economy.

Lozovyi & Kudina (2007), based on the studied suggests that high interest rates in the country of destination can attract investors in the form of a portfolio, while rising interest rates offered by other countries tend to lower capital inflows

in the form of a portfolio. So that the influence exerted by interest rates on foreign portfolio investment is inversely proportional to its effect on foreign direct investment.

Chow (2008), said that the increase in capital flows to Asia in recent years due to low interest rates in developed countries, while investors look for investments that generate high yields.

( Seim 2009) find a negative relationship between FDI inflows and the degree of openness for countries in transition. In other words, the relationship between trade openness and FDI inflows is very complex, needs careful explanation and may depend on the characteristics of each case. Theoretically, the effect of trade openness on FDI inflow varies depending on the motivation for engaging in FDI activities

Sri Muwarni (2010) analyze about monetary policy and Foreign Direct Investment found that Inflation is the most influence independent variable to attract Foreign Direct Indonesia than interest rate and exchange rate in Indonesia.

Kishor Sharma, et.al (2012) aims to meet the gap through a systematic econometric investigation using the cointegration and error correction model. Results suggest that openness and the quality of labor force have been the influential factors in attracting FDI to Malaysia in the long-run, while in the short-run it is quality of infrastructure that has been instrumental. These findings point to the importance of policy reforms aimed at opening up the economy, and improving the quality of labor force as well as physical infrastructure for attracting foreign investment in developing countries like Malaysia.

## 2.4 Hypothesis

In this research appear some hypotheses, which are:

1. There is positive relationship between gross domestic product and foreign direct investment in Indonesia.
2. There is negative relationship between BI rate and foreign direct investment in Indonesia.
3. There is negative relationship between inflation and foreign direct investment in Indonesia.
4. There is positive relationship between openness and Foreign direct investment in Indonesia.

## CHAPTER III

### RESEARCH METHOD

#### 3.1 Scope of Research

This research focus to determinants foreign direct investment in Indonesia for short run and long run using Error Correction Model (ECM) method. This research use secondary data and quantitative data, the data is time series data in quarterly period and the sources of data from Indonesia central bank, BPS Indonesia (Bureau of Statistics Indonesia), and World Investment Reports Statistic. The variables that be used in this research are the value of FDI inflows , gross domestic product, BI rate, inflation and Openness.

1. The value of FDI inflows

The value of FDI inflows become dependent variable in this research, and measured by FDI inflows to Indonesia in real terms (Billion Rupiah). So, for the result we will see the effect of independent variable to the dependent variable which in this research is the value of FDI inflows. Foreign direct investment (FDI) data used is FDI inflow Indonesia in quarterly period of 2000-2014.

2. Gross Domestic Product (GDP)

Gross Domestic Product is proxied by the level of real GDP, gross domestic product become independent variable in this research. So, in this research how much real GDP can influence the value of FDI inflows. Gross domestic product (GDP) data used is GDP at constant prices or real GDP (Billion Rupiah) in quarterly period of 2000-2014.

### 3. BI rate

BI rate is interest rate that announced by central bank of Indonesia. BI rate become independent variable in this research. So, in this research how much BI rate can influence the value of FDI inflows. BI rate data used is interest rate Bank of Indonesia at percentage in quarterly period of 2000-2014.

### 4. Inflation

Inflation is the tendency of the average price increase in general. Inflation rate can be determined by calculating the difference between the consumer price index to the year before the current year divided by the consumer price index previous year, then multiplied by 100 percent. Inflation data used is the quarterly inflation period of 2000-2014.

### 5. Openness

Openness defined as the ratio of total trade (exports plus imports) to GDP. Openness become independent variable in this case. So, in this research how much total production can influence the value of FDI inflows. Openness data used is (exports plus imports) to GDP in quarterly period of 2000-2014.

## **3.2 Type and Sources of Data**

The data used in this research is secondary data and quantitative data, the data is time series data in quarterly period. The sources of the data from Indonesia Central Bank (Bank Indonesia), Bureau of Statistics Indonesia (BPS), and World Investment Report.

### 3.3 Method of Analysis

Short-term and long-term relationship in this study using Error Correction Model (ECM) method. In order to obtain an accurate estimation result, the preliminary test of Error Correction Model model is unit root test and cointegration test. The unit root test is used to test the stationary data. Stationery is one important requirement in econometric models for time series data. Stationary data are data that show the mean, variance and autovarian remains the same at any time the data was used, meaning that the data indicate that data is stable stationary. To determine the stationary nature of the data in this study using a unit root test with Augmented Dickey-Fuller Test (ADF). The next test is the cointegration test used to guarantee the existence of long term relationship between variables tested. In this study, cointegration test used is a Johansen Cointegration Test.

Error correction model can be used to explain why economic agents face an imbalance in the context of that phenomenon desired by economic actors are not necessarily the same as what the real and the corresponding need to make adjustments as a result of differences in actual phenomena encountered over time. Furthermore, by using the ECM can be analyzed theoretically and empirically whether the resulting model is consistent with the theory or not (Isnowati, 2002).

According to Insukindro (2003) Reasons to use ECM in this study are:

1. ECM which is an autoregressive, following consideration lag effect in the analysis so that the model is suited for applications in research that uses the data in the form of time series

2. The ability of ECM includes many variables in analyzing the phenomenon of short-term economic and long-term
3. This approach has been applied in Indonesia and is able to explain the economic experiences in Indonesia

According to Khisor *et al.* (2012), to examine the effect gross domestic product, BI rate, inflation and openness to Foreign Direct Investment, the model can write as below:

$$\mathbf{FDI = f(GDP, BIRATE, INF, OPEN)} \quad (3.1)$$

Where:

FDI = Foreign Direct Investment

GDP = Gross Domestic Product

BIRATE = BI rate

INF = Inflation Index

OPEN = Openness

According to Syarid (2004), the function as showed in equation (3.1) can be written in the form of the econometric model using linear assumption in the parameters, but not in its function and the econometric equations are stochastic equations. Mathematically, the econometric model can be written as below:

$$\mathbf{FDI_t^* = a_0 + a_1GDP + a_2BIRATE + a_3INF + +a_4OPEN + u} \quad (3.2)$$

Where :

u = Disturbance error

a0 = Intercept or constant

a1, a2, and a3 = Coefficient parameter of GDP, BIRATE, INF and OPEN

Insukindro (2003) in Syarid (2004), derive in dynamic linear model can be done by using two approaches, the approach autoregressive distributed lag (ADL) and the quadratic cost function approach is often called the theoretical approach to the dynamic linear models. This study uses economic theory approach that wants to analyze the relationship FDI inflow in Indonesia with the main factor that influenced by GDP, BI rate, inflation and openness. Therefore, in this study using a quadratic cost function. Quadratic cost function in economic models often use a model called the Error Correction Model.

To derive the equation (3.2) to be the ECM framework, could apply the single quadratic cost function. To know relationship between GDP, BIRATE, INF and OPEN to FDI can be written as below:

$$C_t = e_1(FDI_t - FDI_t^*)^2 + e_2\{(1 - B)FDI_t - f_t(1 - B)Z_t\}^2 \quad (3.3)$$

Where :

$e_1(FDI_t - FDI_t^*)^2$  is a component of the cost of imbalance

$e_2\{(1 - B)FDI_t - f_t(1 - B)Z_t\}^2$  is a component of the cost of adjustment

$FDI_t$  is the actual variable of Foreign Direct Investment

$FDI_t^*$  is desired variable of Foreign Direct Investment

$B$  is operating in action time or lag period  $t-1$

$Z_t$  is a vector that affects FDI

$f_t$  is the weight vector component adjustment costs

$e_1, e_2$  is the weight given to both the cost function

In this case the desired variable shown by the following equation:

$$FDI_t^* = a_0 + a_1GDP + a_2IBIRATE + a_3INF + a_4OPEN \quad (3.4)$$

To minimize the cost function quadratic equation (3.3), take the derivative of a quadratic cost function against FDI<sub>t</sub> or ( $\partial C_t / \partial FDI_t = 0$ ). Simplify, the derivative results could be obtained as the following equation:

$$FDI_t = eFDI_t^* + (1-e)FDI_{t-1} - (1-e)f_1(1-B)Z_t \quad (3.5)$$

Where :

$$e = e_1/(e_1+e_2) \text{ and } (1-e) = e_2/(e_1+e_2)$$

By substituting equation (3.4) to the equation (3.5), it is obtained the following equation:

$$FDI_t = a_0e + a_1eGDP + a_2eBIRATE + a_3eINF + a_4eOPEN - (1-e)FDI_{t-1} + (1-e)f_1(1-B)GDP - (1-e)f_2(1-B)BIRATE - (1-e)f_3(1-B)INF - (1-e)f_4(1-B)OPEN \quad (3.6)$$

Equation (3.6) can be simplified into the following equation:

$$Q_t = q_0 + q_1GDP_t + q_2BIRATE_t + q_3INF_t + q_4OPEN_t + q_5GDP_{t-1} + q_6BIRATE_{t-1} + q_7INF_{t-1} + q_8OPEN_{t-1} + q_9FDI_t + u_t \quad (3.7)$$

Where:

$$q_0 = a_0e, \quad q_1 = a_1e + (1-e)f_1, \quad q_2 = a_2e + (1-e)f_2, \\ q_3 = a_3e + (1-e)f_3, \quad q_4 = a_3e + (1-e)f_4, \quad q_5 = -(1-e)f_1, q_6 = \\ -(1-e)f_2, \quad q_7 = -(1-e)f_3, \quad q_8 = (1-e)f_4, \quad q_9 = -(1-e)f_5,$$

Equation (3.7) reflects the short term relationship or imbalances that include variable inaction FDI<sub>t</sub>, GDP, BIRATE, INF and OPEN. The key problem in estimating equation (3.7) is related to the level observed variable is not stationary. If the observed variables are not stationary, the estimation of equation

(3.7) to make use of OLS will cause spurious regression or results that are not effective and efficient (Syarid, 2004).

To solve the spurious regression, equation (3.7) re-parameterized to be:

$$DFDI_t = \alpha_1 DGDP_t + \alpha_2 DBIRATE_t + \alpha_3 DINF_t + \alpha_4 DOPEN_t + \alpha_5 (FDI - \beta_0 - \beta_1 GDP - \beta_2 BIRATE - \beta_3 INF - \beta_4 OPEN)_{t-1} \quad (3.8)$$

Where:

$$DX_t = X_t - X_{t-1}$$

$$\alpha_1 = q_1, \quad \alpha_2 = q_2, \quad \alpha_3 = q_3, \quad \alpha_4 = q_4,$$

$$\alpha_5 = -(1 - q_7) \quad \beta_0 = q_0/1 - q_7, \quad \beta_1 = q_1 + q_2/1 - q_7,$$

$$\beta_2 = q_2 + q_5/1 - q_7, \quad \beta_3 = q_3 + q_6/1 - q_7 \quad \beta_4 = q_4 + q_7/1 - q_7,$$

Equation (3.8) shows that foreign direct investment (DFDI) are affected by changes of GDP, BIRATE, INF and OPEN, and component error correction term or inaction of one period. The equation above also reflects that the model only included the inaction of the period as first-degree models of ECM . In equation (3.8), the parameter  $\alpha$  ( $\alpha_1, \alpha_2$ ) describes the effect of short-term variable GDP, BIRATE, INF and OPEN to FDI and the parameter  $\beta$  ( $\beta_1, \beta_2$ ) describes the effect of long-term variable GDP, BIRATE, INF and OPEN to FDI.

Equation (3.8) more often parameterized in the form of the equation:

$$DFDI_t = \gamma_0 + \gamma_1 DGDP_t + \gamma_2 DBIRATE_t + \gamma_3 DINF_t + \gamma_4 DOPEN_t + \gamma_5 GDP_{t-1} + \gamma_6 BIRATE_{t-1} + \gamma_7 INF_{t-1} + \gamma_8 OPEN_{t-1} + \gamma_9 (GDP_{t-1} + BIRATE_{t-1} + INF_{t-1} + OPEN_{t-1} - FDI_{t-1}) \quad (3.9)$$

Where:

$$\gamma_0 = -\alpha_7 \beta_0 \quad \gamma_1 = \alpha_1 \quad \gamma_2 = \alpha_2 \quad \gamma_3 = \alpha_3 \quad \gamma_4 = \alpha_4$$

$$\gamma_5 = -\alpha_5(1 - \beta_1) \quad \gamma_6 = -\alpha_6(1 - \beta_1) \quad \gamma_7 = -\alpha_7(1 - \beta_1)$$

$$\gamma_8 = -\alpha_8(1 - \beta_1) \quad \gamma_9 = -\alpha_5$$

In principle, the equation (3.8) and equation (3.9) in the analysis of time series is known as the standard error correction model or standard ECM. In analyzing the long-term effects of economic growth as changes GDP, BIRATE, INF and OPEN equation (3.9) can be transformed into another form of equation, as below:

$$DFDI_t = \delta_0 + \delta_1 DGDP_t + \delta_2 DBIRATE_t + \delta_3 DINF_t + \delta_4 DOPEN_t + \delta_5 GE_{t-1} + \delta_6 IPI_{t-1} + \delta_7 FDI_{t-1} + \delta_8 FDI_{t-1} + \delta_9 ECT \quad (3.10)$$

Where :

$$ECT = GDP_{t-1} + BIRATE_{t-1} + INF_{t-1} + OPEN_{t-1} - FDI_{t-1}$$

The model (3.10) will be able to explain the characteristic of the ECM model, where ECM model will be valid as long term analysis if error correction term (ECT) is significant and the value must be greater than zero and less than one and not be negative (Syarid, 2004; Susilo and Arsyad, 2012; Nurwulandari and Fuadi, 2013; and Sarwedi, 2002).

From equation (3.10) long-term regression coefficients for the constant variable GDP, BIRATE, INF and OPEN in Error Correction Model (ECM) as below:

$$\begin{aligned} f0 &= \alpha_0/\alpha_7 \text{ is coefficient for constant in long run} \\ f1 &= (\alpha_4 + \alpha_7) / \alpha_7 \text{ is coefficient for GDP in long run} \\ f2 &= (\alpha_5 + \alpha_7) / \alpha_7 \text{ is coefficient for BIRATE in long run} \\ f3 &= (\alpha_6 + \alpha_7) / \alpha_7 \text{ is coefficient for INF in long run} \\ f4 &= (\alpha_7 + \alpha_7) / \alpha_7 \text{ is coefficient for OPEN in long run} \end{aligned} \quad (3.11)$$

Long-term standard deviation coefficient for economic growth with Error

Correction Model is as below :

$$\text{Var}(f_0) = F_{0T} V(\alpha_7, \alpha_0) F_0$$

$$\begin{aligned} F_{0T} &= [\partial f_0 / \partial \alpha_0 \quad \partial f_0 / \partial \alpha_7] \\ &= [1/\alpha_7 \quad -f_0/\alpha_7] \end{aligned}$$

$$\text{Var}(f_1) = F_{1T} V(\alpha_7, \alpha_4) F_1$$

$$\begin{aligned} F_{1T} &= [\partial f_1 / \partial \alpha_4 \quad \partial f_1 / \partial \alpha_7] \\ &= [1/\alpha_7 \quad -(f_1-1)/\alpha_7] \end{aligned}$$

$$\text{Var}(f_2) = F_{2T} V(\alpha_7, \alpha_5) F_2$$

$$\begin{aligned} F_{2T} &= [\partial f_2 / \partial \alpha_5 \quad \partial f_2 / \partial \alpha_7] \\ &= [1/\alpha_7 \quad -(f_2-1)/\alpha_7] \end{aligned}$$

$$\text{Var}(f_3) = F_{3T} V(\alpha_7, \alpha_6) F_3$$

$$\begin{aligned} F_{3T} &= [\partial f_3 / \partial \alpha_6 \quad \partial f_3 / \partial \alpha_7] \\ &= [1/\alpha_7 \quad -(f_3-1)/\alpha_7] \end{aligned}$$

$$\text{Var}(f_4) = F_{4T} V(\alpha_7, \alpha_7) F_4$$

$$\begin{aligned} F_{4T} &= [\partial f_4 / \partial \alpha_7 \quad \partial f_4 / \partial \alpha_7] \\ &= [1/\alpha_7 \quad -(f_4-1)/\alpha_7] \end{aligned} \tag{3.12}$$

$\text{Var}(f_0)$ ,  $\text{Var}(f_1)$ ,  $\text{Var}(f_2)$ ,  $\text{Var}(f_3)$  and  $\text{Var}(f_4)$  is an assessment of each variance  $f_0, f_1, f_2, f_3$  and  $f_4$ . While  $V(\alpha_7, \alpha_0)$ ,  $V(\alpha_7, \alpha_4)$ ,  $V(\alpha_7, \alpha_5)$ ,  $V(\alpha_7, \alpha_6)$  and  $V(\alpha_7, \alpha_7)$  are the variance and covariance matrix of the parameter being suspected (Syarid, 2004).

From equation (3.11) and (3.12) , can be seen that the standard deviation of the long term regression coefficient correlation model of long term error

correction model obtained after assume regression coefficient and variance-covariance matrix of the error correction model parameters used.

### **3.4 Preliminary Test**

#### **3.4.1. Unit Root Test**

This study uses the unit root test to see stationary data. Test the degree of integration would be done if the data is not stationary at zero degrees. Stationarity test is not whether the data time series contains a unit root. The method that used is the Augmented Dickey-Fuller Test. Testing the unit root using the Phillips-Peron Test or Augmented Dickey-Fuller. The ADF test improve higher order serial correlation by adding the time difference on the right side.

Some simulation study shows that the nonparametric test Phillips and Peron has a more serious distortions in the number of samples when the data in general have the advantage of negative autocorrelation in the first difference. It can be used as the opinion, that the nonparametric test Phillips-Peron less convincing to use than the ADF. This is suggested the use ADF tests are easier to use with modifications to be able to resolve the problem.

If the probability of the t-statistic is smaller than the level of alpha (5 %), then it means that it means that data is stationary. But the desired test result, all variables are not stationary at level, the probability value of each variable must be greater than the specified alpha (5 %). All variables that is not stationary at level so that the application of ECM method should be continued. If it has been ascertained that the data is not stationary in the level, so we have to repeat steps with unit root test by 1st difference, and 2nd difference to produce probability values are stationary.

### 3.4.2. Cointegration Test

After conducting the stationary test data characteristics can we know whether the data will be used for this research is the data are stationary or not. Cointegration can be interpreted as a long-term relationship (long term relations / equilibrium) between variables are not stationary. The existence of cointegration relationship provide opportunities for data that individually are not stationary to generate a linear combination of the data between the stretcher so as to create conditions that are stationary. Cointegration regression intends to prove that occur conformity with the theory of the long-term.

Cointegration test is a continuation of the unit root test and test the degree of integration. The purpose is to test the cointegration test stasionaritas cointegration regression residuals. Stationary residuals is very important if you want to develop a dynamic model, especially ECM which includes key variables in the cointegrating regression related. In principle, the error correction model (ECM) there is a balance between the long-term fixed economic variables. if in the short term there is an imbalance in one period, it will correct the error correction model itself an error in the next period. This error correction mechanism can be interpreted as aligning the behavior of short-term and long-term. Thus the error correction model is consistent with the concept of cointegration.

The Johansen Cointegration Test is a test for cointegration of time series data. Cointegration is the property of two time series data where both share common stochastic drift. Stochastic drift is the change in average value of the random or stochastic process. The advantage of the Johansen Cointegration Test

comes from its ability to handle several time series variable; in contrast, the Engle-Granger test could handle only one cointegration relationship. The Johansen Cointegration Test has two types of tests: (i) trace test and (ii) maximum eigenvalue test.

### **3.5. Classical Assumption Test**

Classic assumption test is a test to assess the presence or absence econometric research bias. The regression model used to be used as a tool that is not biased estimate if it meets the requirements of BLUE (Best Linear Unbiased Estimator) that there is no multicollinearity, autocorrelation, and heteroscedasticity. If the model used occur multikolinearity, autocorrelation, and heteroscedasticity the regression estimator is not efficient, forecasting based on regression will be bias and test a common standard for the regression coefficient becomes invalid.

#### **a) Multicollinearity**

Multikolinearity test was used to test the assumption that among the independent variables in a model are not correlated with one another. This can cause the regression model obtained invalid to assess the independent variable.

According to Gujarati (2011), to determine the presence of symptoms of multicollinearity in the regression model can be done by looking at the correlation coefficient. The correlation coefficient in excess of 0.80 indicate multikollinearity.

## b) Heteroscedasticity

Heteroscedasticity test aims to test whether the regression model occurred inequality residual variance from one observation to another observation tests on Heteroscedasticity symptoms can be conducted by White Test, namely by means of residual squares regression of the independent variables, independent variables squared and multiplying independent variables. Guidelines for the use of white models test is if the value of Chi-Square count is greater than the critical value with certain degree of confidence ( $\alpha$ ), it showed there is heteroscedasticity problem. If the Chi-Square count is smaller than the critical value it showed there is no heteroscedasticity problem. By testing the following steps.

Hypothesis

$H_0$  = no heteroskedasticity

$H_a$  = occurs heteroskedasticity

Decision-making is done by the following criteria:

If the probability  $Obs * R^2 < 0.05$  then  $H_0$  is rejected, there is heteroskedasticity

If the probability  $Obs * R^2 > 0.05$  then  $H_0$  is accepted, does not occur heteroskedasticity.

## c) Autocorrelation

Autocorrelation test aims to test whether the linear regression model is no correlation between error in period  $t$  with error in period  $t-1$ . To see whether there is autocorrelation can be done by testing Lagrange Multiplier (LM test), by

comparing the value of the probability of R-Square with  $\alpha = 0.05$  (Gujarati, 2011).

Test steps as below:

Hypothesis

$H_0$  = no autocorrelation

$H_a$  = occurs autocorrelation

Decision-making is done by the following criteria:

If the probability  $Obs * R^2 < 0.05$  then  $H_0$  is rejected, there is autocorrelation.

If the probability  $Obs * R^2 > 0.05$  then  $H_0$  is accepted, does not occur autocorrelation.

## CHAPTER IV

### GENERAL OVERVIEW

#### 4.1 Overview Foreign Direct Investment in Indonesia

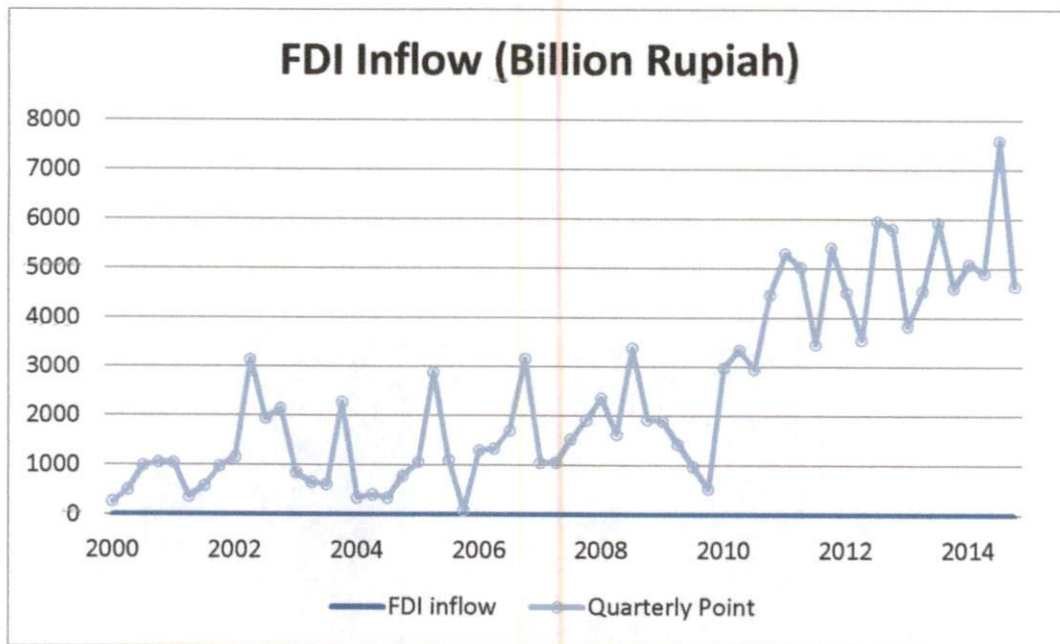
Foreign direct investment is an effort made by foreign parties in order to invest in a country with the aim of gaining profit through the creation of a production or service. According to Krugman and Obstfeld (2004), which referred to the foreign direct investment (FDI) is an international flow of capital from a country where the company is set up or expand operations or business networks in other countries. According to the Law of the Republic of Indonesia Number 25 Year 2007 on Investment, foreign direct investment (FDI) is an investment activity to conduct business in the territory of the Republic of Indonesia, made by a foreign investor, whether the use of foreign capital and joint venture with capital investment domestic.

The flow of foreign capital into Indonesia in the early 2000s was still very little. foreign capital into Indonesia are very small because the government severely restricts the presence of foreign investors in Indonesia. Besides Indonesia unfavorable reputation in the eyes of foreign investors making them reluctant to invest in Indonesia. However, due to the presence of foreign investment is necessary for the growth of the Indonesian economy, therefore the government continues its efforts to attract foreign investors to be willing to invest in Indonesia. This is done by seeking the creation of a conducive investment climate through deregulation and de-bureaucratization.

Since the issuance of Law No. 1 year 1967 on FDI by the Indonesian government and some deregulation policy in the field of investment and

government regulations on foreign investment, proved to have been able to attract foreign investment materialized in the presence of FDI which jumped sharply. Several government regulations is the package in May 1986, PP 17, 1992 can be seen from the departure of several large foreign companies such as Sony and Nike that its FDI move to Malaysia and Vietnam. A sharp decline from the number of approved FDI dropped to 13563.1 million dollars when compared to the previous year amounted to 33832.5 million dollars and up to 2004 the number of FDI in Indonesia continues to decline.

Although the presence of FDI is nothing to support and none against, in the 2000s multinational companies have reached glory and has a significant challenge in which occurs the era of globalization and the liberalization of the economy in some developing countries, so that the terms of a the hope and promise that is sure to gain a greater good for the host country or foreign company itself.



**Figure 4.1 Trends of FDI inflow in Indonesia**

Based on figure 4.1 show that trend of FDI inflow in Indonesia tends to fluctuate every quarterly in years during period 2000-2014. At the beginning from first quarter 2000 until last quarter FDI inflow in Indonesia increase, it from 268 to 1,054 billion rupiah. It show that during 2000 FDI inflow in Indonesia increasing by quarterly. But during 2001 FDI inflow in Indonesia decreasing, it cause unstabilize of economy. Data show that from first quarter at point 1,053 billion rupiah tend to decreasing in last quarterly at point 986 billion rupiah.

In 2002 FDI inflow Indonesia at good condition cause generally condition of Indonesian economy show positive growth that characterized by stable macroeconomics. It seen on the data that at second quarterly 2002 FDI inflow in Indonesia at the best increasing level, it could see at that point 3,146 billion rupiah. Eventhought at the closing quarterly FDI inflow decreasing at point 2,153

billion rupiah. During 2003 and 2004 FDI in Indonesia around below a thousand billion rupiah, it cause of Bali Bom tragedy. Investor think that bad condition in Indonesia cause of terrorism give influence to safety to invest in Indonesia, that's why by the data show that decreasing level of FDI in Indonesia.

During 2005 and 2006 FDI inflow in Indonesia decreasing at low level until now. The data show us that at last quarterly 2005 FDI in Indonesia at the low level at point 94 billion rupiah. It cause inconsistency economy in Indonesia, But also the economy Indonesia that shock to recovery about this case. In 2005, the government also released four policies packet in energy, monetary, fiscal, and investment. The government wanted to promote investment and anticipated the increases of oil price and the depreciation of Rupiah against US Dollar.

The government released the deregulation packet in 2006 to promote investment climate. The policy was Presidential Decree No.3, 2006. The area was covered, such as, general, customs, tax, labor, and small-medium business scale. And then FDI inflow in Indonesia would be better in 2006. It seen increasing level of FDI inflow in Indonesia from 1,305 to 3,162 billion rupiah.

In 2008, Indonesian economy was recorded decreases 6.01% due to affected by global crises even Singapore and Japan as exporter countries stating that there is no positive economic growth. It the cause of inconsistency FDI inflow in Indonesia that at first quarterly 2,360 billion rupiah and the second period decrease to 1,633 billion rupiah. Then at the third increase to 3,388 and the last of quarterly decrease at 1,937 billion rupiah.

During period 2009 and 2010 economy still recovery, but Indonesian economy still face some problems like higher inflation, restriction in real sector,

capital inflow, and so on. So FDI inflow Indonesia in 2009 about 4,872 billion rupiah. In 2010 FDI inflow in Indonesia increasing at point 13,771 billion rupiah.

Then during period 2011 and 2012 Indonesian economy still tends to increase to recovery because of that FDI inflow in Indonesia at first quarterly 2011 at point 5,311 billion rupiah and the second period stabilize in 5,034 billion rupiah. Then at the third decrease to 3,469 and the last of quarterly increase at 5,428 billion rupiah. And then in 2012 GDP in Indonesia increasing but not significant point and inconsistent, it could see that in second quarterly to last quarterly 2012, FDI inflow in Indonesia tend to increase from point 3,568 to 5,964 billion rupiah.

In 2013 FDI inflow Indonesia still tend to increase, it could see at first quarterly 2013 at point 3,840 billion rupiah and the second period increase to 4,558 billion rupiah. Then at the third increase to 5,929 billion rupiah and the last of quarterly decrease at 4,620 billion rupiah, FDI inflow Indonesia in 2013 reach at point 18,947 billion rupiah. During 2014 FDI inflow Indonesia tend to fluctuatif quarterly, it seen by the third period and last period quarterly FDI inflow decrease from 7,593 to 4,658 billion rupiah. But by the years FDI inflow in 2014 still increasing at point 22,276 billion rupiah.

In conclusion, the government policies after financial crisis focused on strengthening investment improvement. Financial crisis caused investment to be down, especially foreign direct investment. Therefore, the government deregulation that supported investment climate should be introduced. Some of the government deregulation aimed to enhance the current account performance. By

current account liberalization, the business climate becomes more competitive and this situation attracts the foreign investors to invest in Indonesia.

#### 4.2 Trends of Gross Domestic Product (GDP) in Indonesia

Economic development is one measure of government policy especially in economic field. Economic development is an overview of economic development level of trade that occurred. Economic developments in detail from year to year are presented through Gross Domestic Product (GDP) regularly. Despite, Gross Domestic Product not fully describe the welfare of country, but at least it can be used as indicator that can reflect a country economic progress. Indonesia continues to maintains or improving the economic growth that used as indicator of success of development.

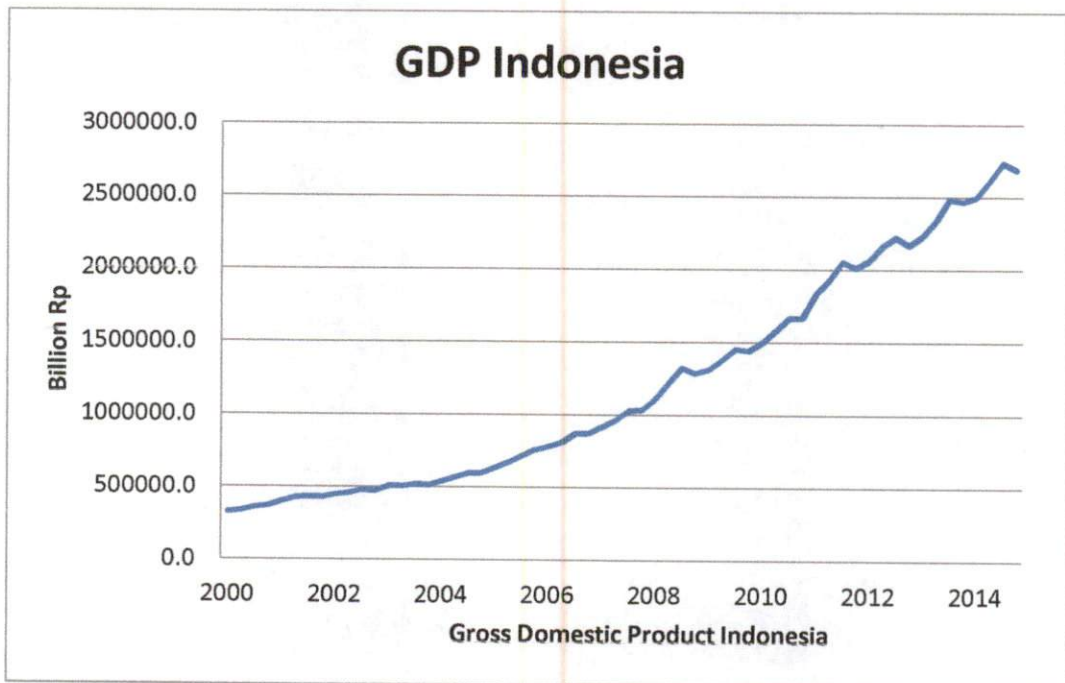


Figure 4.2 Trends of Gross Domestic Product (GDP) in Indonesia

According to figure 4.2 in the beginning of 2000, Indonesian economy showed strong economic recovery with a more balanced economic growth. In 2000, gross domestic product at first quarterly 324,232.0 billion rupiah and the last of quarterly increase at 368,448.2 billion rupiah, so gross domestic product growth arise 5.35% or 1,389,769.5 billion rupiah is higher than annual estimation of Indonesian Bank about 3 – 4%. Export and investment are as a driver of economic recovery in 2000.

At 2001, Indonesian economy showed slow economic growth. GDP growth about 3.6%, this caused by world economy is in worst condition and related to debt. At 2002, generally condition of Indonesian economy show positive growth that characterized by stable macroeconomics. But economic growth only arises about 1,863,274.7 billion rupiah.

During 2003, Indonesian economy face challenges as related to the impact of the tragedy in Bali at 2002, planning to out of International Monetary Funds (IMF) at ended of 2003, and world economic condition are still weak. In 2003, gross domestic product at first quarterly 507,143.0 billion rupiah and the last of quarterly increase at 512,560.6 billion rupiah, So, GDP growth reaches 4.78% or 2,045,853,5 billion rupiah. At 2005 GDP growth about 5.69% but tends to decrease becomes 5.39% in 2006.

In 2007, Indonesian economy tends to stable because GDP growth reach 6.34%. This caused by growth of domestic demand, both of consumption and investment. Private consumption increased due to better purchasing power, meanwhile investment growth increase due to better perception of investors and increasing the return on investment. Three sectors that giving bigger contribution

on GDP are agriculture, industries, and trade. In 2007, gross domestic product at first quarterly 920,203.1 billion rupiah and the last of quarterly increase at 1,035,418.9 billion rupiah, GDP growth reach 6.34% at point 3,950,893.2 billion rupiah.

During 2008, Indonesian economy was recorded decreases 6.01% due to affected by global crises even Singapore and Japan as exporter countries stating that there is no positive economic growth. gross domestic product at first quarterly 1,110,032.3 billion rupiah and the second period increase to 1,220,605.9 billion rupiah. Then at the third increase to 1,327,509.6 and the last of quarterly increase at 1,290,504.6 billion rupiah, GDP growth reach 6.01% at point 4,948,688.2 billion rupiah.

During period 2009 and 2010 economy still recovery, but Indonesian economy still face some problems like higher inflation, restriction in real sector, capital inflow, and so on. GDP growth arise 6.10% greater than 2009 about 4.57%. In 2009 GDP Indonesia at point 5,603,871.2 billion rupiah and in 2010 at point 6,422,918.2 billion rupiah.

Then during period 2011 and 2012 Indonesian economy still tends to increase because GDP growth at first quarterly 2011 at point 1,834,355.1 billion rupiah and the second period increase to 1,928,233.0 billion rupiah. Then at the third increase to 2,053,745.4 and the last of quarterly increase at 2,015,392.5 billion rupiah, GDP growth in 2011 reach at point 7,831,726.0 billion rupiah. And then in 2012 GDP in Indonesia increasing but not significant point, it could see that in third quarterly to last quarterly 2012, GDP in Indonesia tend to decrease from point 2,223,641.6 to 2,168,687.7 billion rupiah.

Then, in 2013 GDP Indonesia consist to increase, it could see at first quarterly 2013 at point 2,232,478.4 billion rupiah and the second period increase to 2,337,789.2 billion rupiah. Then at the third increase to 2,484,363.8 billion rupiah and the last of quarterly increase at 2,470,105.1 billion rupiah, GDP growth in 2013 reach at point 9,524,736.5 billion rupiah. During 2014 GDP Indonesia tend to fluctuatif quarterly, it seen by the third period and last period quarterly GDP decrease from 2,739,466.4 to 2,690,240.9 billion rupiah. But,by the years GDP in 2014 still increasing at point 10,542,693.5 billion rupiah.

#### **4.3 Trends of Bank Indonesia rate (BI rate) in Indonesia**

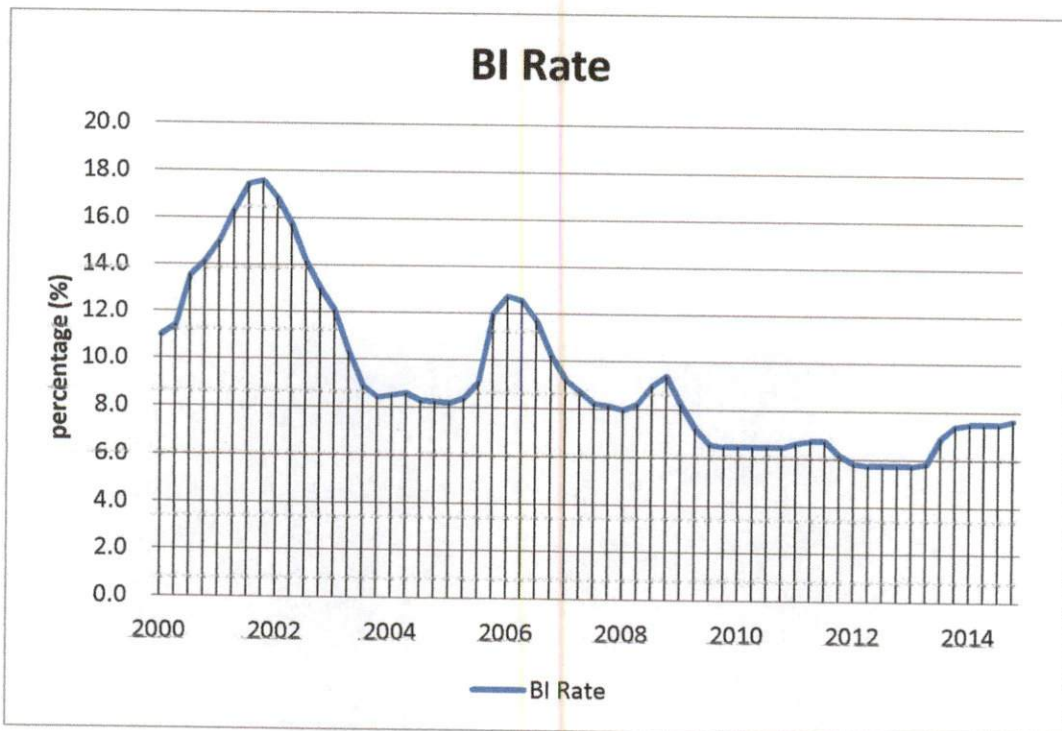
Interest rate is the price of funds that can be borrowed (loanable Funds) which is determined by the preferences and resources of various economic actors market. The level loan interest rate is one of the factors that determine the amount of capital flows from one country to another. Interest rate policy in the country is part of government efforts to increase capital accumulation in various development sectors. Chow (2008) also revealed that the increase in capital to developing countries these days is as a result of low interest rates in developed countries. It can be concluded that the level of international interest rates and domestic interest rates have an influence on the increase in Foreign Direct Investment in Indonesia.

Interest rate policy directed to stimulate economic activity without reducing the desire to save money. I started to light up the lamp III setting interest rates is done directly by the government both deposit rates and lending rates, this is an effort to mobilize public funds by bank lending in order to develop the

economic sectors prioritized. Determination of the direct interest rate adjusted to develop monetary conditions.

According to Sadono Sukirno (2000) the investment will have to consider the interest rate, if the interest rate is higher than the rate of return on capital, the planned investment is not profitable, and therefore the company plans to invest will be canceled. The interest rate in Indonesia refers to the interest rate of Bank Indonesia Certificates commonly called SBI currently called BI Rate. In determining the BI Rate, Bank Indonesia as the government agencies in determining monetary policies always pay attention to the state of the economy is happening, because of the BI Rate will be responded by interest rates at commercial banks that affect the economy.

One study states that the interest rate affects the flow of foreign direct investment in Indonesia is a research Tri Rahayu (2010), where the interest rate is negative and significant impact on foreign direct investment in Indonesia. The importance of in-depth studies to determine the size of the government in the interest rate in accordance with the state of the economy is needed, because it will affect investment, both foreign and domestic. In accordance with the statement of Gregory Mankiw (2007) in his book that the amount of investment can not be separated from the interest rate.



**Figure 4.3 Trends of BI rate in Indonesia**

Based on figure 4.3 above shows that BI rate in Indonesia tends to fluctuated whether increased or decreased during quarterly period of 2000 - 2014. At during quarter 2000 - 2001 in term of economic recovery from crises, BI rate tends to increase in which first quarterly 2000 about 11.0% to 17.6% at point last quarterly in 2001. But after that the data show that BI rate tends to decrease from first quarterly 2002 at 16.9% to the third quarterly 2005 around 9.1%, but the last quarterly 2005 increase at 12.0

And then, the data show that BI rate increase in 2006 by at first quarterly 2006 at point 12.8% and the second period tends to decrease to 12.6%. Then at the third decrease to 11.8% and the last of quarterly also decrease at 10.3%, And then during first quarterly 2007 until last quarterly 2010 BI rate Indonesia decreasing,

even at last quarterly increase at point 9.4% but at the end of quarterly 2010 BI rate tends to decrease at 6.5%.

BI rate increasing but not significant point during 2011, cause at the end of quarterly 2011 it could see that in percentage last quarterly 2011 decrease from 6.8% to 6.2%. and then BI rate from first quarterly 2012 until second quarterly 2013 get constant level, its fixed on 5.8%. After that all, BI rate tends to increasing until end of quarterly 2014, its start from 6.9% (third quarterly 2013) until 7.7% at the end of quarterly 2014.

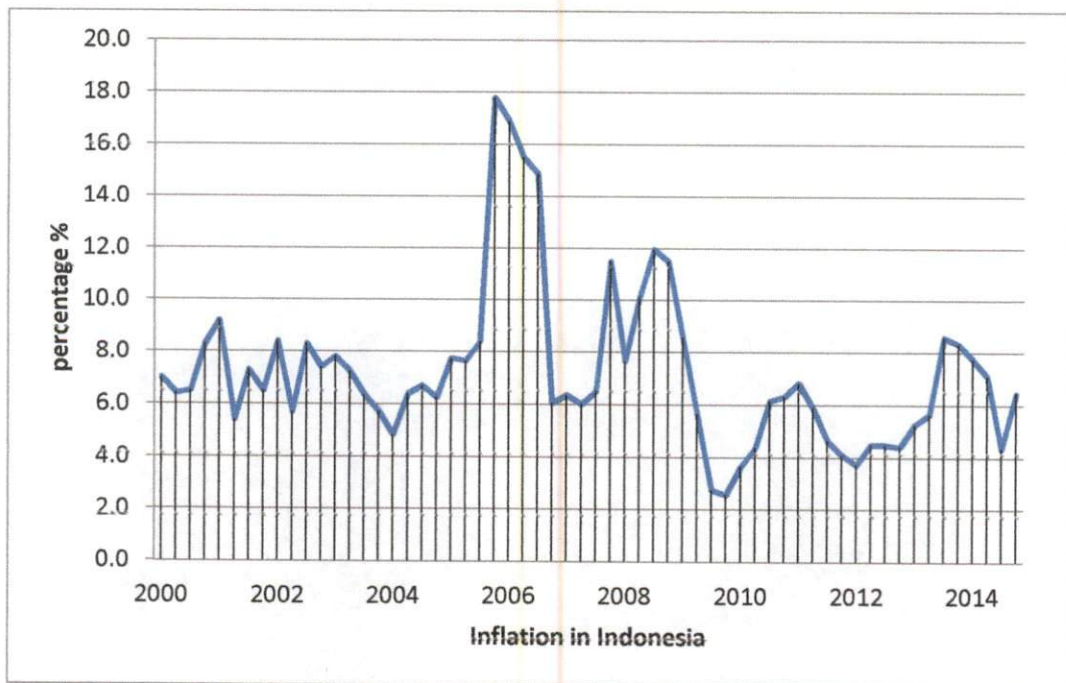
#### 4.4 Trends of Inflation in Indonesia

Simply put inflation is defined as rising prices in general and continuously. Inflation stability is a prerequisite for sustainable economic growth that ultimately benefits the improvement of people's welfare. The importance of inflation control based on the consideration that high inflation and unstable giving negative impact on the socio-economic conditions of society.

The influence of inflation on investment activity have a negative relationship, in which the high rate of inflation will reduce the level of investment due to the high cost of the investment itself. Conversely, a low inflation rate would lead to investment costs become low so that it will stimulate Foreign Direct Investment in the domestic country.

According to Engla D. et al (2013) said that, "Inflation in Indonesia was very high in President Soekarno era due to fiscal and monetary policy was not prudent (if need money, just formed, and published)". In Soeharto era, government tries to push inflation but couldn't below 10% due to Bank of Indonesia have a fold mission, as agent of development which can flow liquidity credit unlimited. In the reformation era, began in President Habibie era, Bank of Indonesia authority is maintaining the value of Rupiah.

Inflation rate tends to stable before economic crises but in 2000s economic growth is well done otherwise inflation rate is not stable that can economic is over heated. High inflation rate will create uncertainty in Indonesian economy because of that government should be pressure the inflation rate to create stable economy in this country.



**Figure 4.4 Trends of Inflation rate in Indonesia**

Based on Statistics Indonesia show that trend of inflation in Indonesia tends to fluctuate every quarterly during period 2000-2014. In 2000 inflation rate recorded about first quarterly 7.0%, then arise becomes 8.3% in third quarterly and arise again about 8.3% in last quarterly in 2000. Until last quarterly 2000 the inflation rate tends fluctuate but still stable in term of one digit.

The inflation rate in 2001 recorded 12.55%, it means inflation rate tends to increase. This caused by political and social conditions of international security experienced shocks with WTC and Pentagon attacks and this also affects the national economy was under pressure due to uncertainty of U.S. bilateral relations.

In the next years, inflation rate still fluctuation because Indonesian economy still unstable although it has changed the leadership of president from new order to the period of reform. As for the economy in the often volatile

exchange rate is unstable and occurs increase of fuel oil prices. This condition occurs in 2005 with inflation rate about 17.11%. At 2008, inflation rate arise about 11.06% that caused by crisis that happened in United States then impact to developing countries included Indonesia and many industries are losses. This economic crisis also called as global economic crises. However, in 2009 and 2010, inflation rate in Indonesia is relatively stable due to the shock of global crisis is not give big impact and this situation persisted until the end of the year.

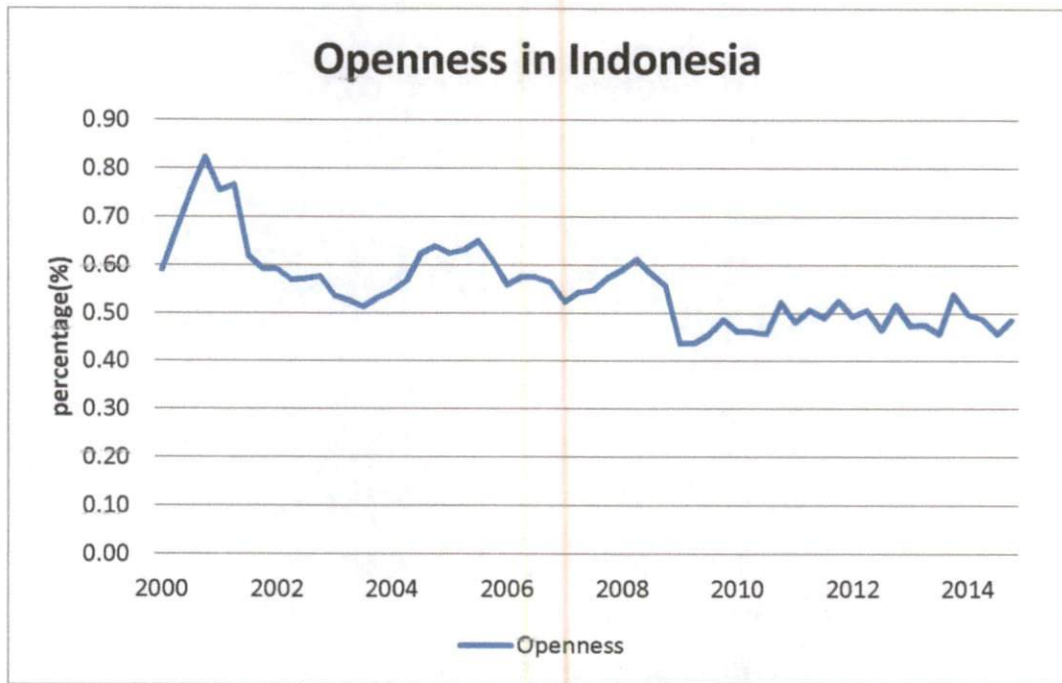
During first quarterly 2011 until last quarterly 2012 Inflation Indonesia tend to decreasing from 6.8% until 4.4%. but in 2013 Inflation in Indonesia increasing by quarterly, the data show that at the first quarterly 5.3% and at the end of quarterly 2013 inflation Indonesia tend to increasing to 8.4%. but in 2014 the data show that inflation decrease at level of 6.5% at the end of the quarterly 2014.

#### **4.5 Trends of Openness in Indonesia**

Trade openness is a significant factor affecting FDI inflows. Theoretically, trade restrictions or openness could affect FDI inflows positively or negatively. Some policies on trade openness might cause a significant impact on attracting FDI. For example, through the implementation of free trade agreements (FTA), several Latin American countries have been able to attract greater flows of FDI. FDI fosters exports, import substitution, or greater trade in intermediary inputs.

There are studies which have found a positive relationship between trade openness and FDI flows (Biglaiser and deRouen 2006; Chakrabarti 2001). On the other hand, ( Seim 2009) find a negative relationship between FDI inflows and the degree of openness for countries in transition. In other words, the relationship

between trade openness and FDI inflows is very complex, needs careful explanation and may depend on the characteristics of each case. Theoretically, the effect of trade openness on FDI inflow varies depending on the motivation for engaging in FDI activities.



**Figure 4.5 Trends of Openness in Indonesia**

Based on figure 4.5 show that trend of percentage openness in Indonesia tends to fluctuate every quarterly in years during period 2000-2014. At the beginning from first quarter 2000 until last quarter percentage openness in Indonesia increase, it from 0.59% to 0.82%. It show that during 2000 FDI inflow in Indonesia increasing by quarterly. But during 2001 percentage openness in Indonesia decreasing, it cause unstabilize of economy. Data show that from first quarter at point 0.76% tend to decreasing in last quarterly at point 0.59%.

During beginning quarterly 2002 until last quarter 2003 percentage openness Indonesia decreasing from point 0.59% until 0.53%. and then beginning quarterly 2004 until last quarter 2005 percentage openness Indonesia increasing from point 0.55% until 0.61%.

During 2005 and 2009 FDI percentage openness in Indonesia decreasing at low level. The data show us that at first quarterly 2009 percentage openness in Indonesia at the low level at point 0.44%. It cause inconsistency economy in Indonesia, but During beginning quarterly 2010 until last quarter 2011 percentage openness Indonesia increasing from point 0.46% until 0.53%.

In 2012 the data show that percentage openness in Indonesia still inconsistency that showed at first quarterly 0.49% and the second period increase to 0.51%. Then at the third tends to decrease at the point 0.46% and the last of quarterly come back to increase at 0.52%.

During period 2013 and 2014 economy still recovery, but Indonesian economy still face some problems like higher inflation, restriction in real sector, capital inflow, and so on. So openness in Indonesia in 2013 showed that first quarterly 0.47% and the second period increase to 0.48%. Then at the third tends to decrease at the point 0.46% and the last of quarterly come back to increase at 0.54%. Then during period 2014 showed at first quarterly 0.50% and the second period decrease to 0.49%. Then at the third tends to decrease at the point 0.46% and the last of quarterly come back to increase at 0.49%.

## CHAPTER V

### EMPIRICAL RESULTS AND ANALYSIS

#### 5.1. Regression Results Analysis

In this research, the author use Error Correction Model (ECM) method to process time series data in order to analyse the relation in five variables, that is Foreign Direct Investment (FDI), Gross domestic product, BI rate, Inflation and Openness. Data used in this research is secondary data with time series data that takes from 2000q1-2014q4. For the data, author uses Foreign Direct Investment (FDI) as dependent variable, meanwhile gross domestic product, BI rate, Inflation and Openness as independent variables. To perform the hypothesis testing stage process carried out with quantitative analysis. In general, the stage or the data processing is done is as follows:

##### 5.1.1 Unit Root Test

In using ECM before performing cointegration test, it is first necessary to test stationary or unit root test of the data by using the Augmented Dickey-Fuller (ADF test), wherein if the probability value is less than alpha 5 percent then the data is stationary.

The degree of integration testing will also be performed if the data is not yet stationer at the level stationary. Unit root test results and test the degree of integration can be seen in Table 5.1 below.

**Table 5.1****Result of Unit Root Test**

Variable	Level	1 <sup>st</sup> Difference	2 <sup>nd</sup> Difference	Order of Integration
	Prob	Prob	Prob	
FDI	0.0086	0.000	0.0000	I(1)
GDP	0.8763	0.1656	0.0000	I(2)
BIRATE	0.2166	0.0113	0.0000	I(2)
INF	0.1657	0.0000	0.0000	I(1)
OPEN	0.0323	0.0001	0.0000	I(2)

Source: Data procesed (Eviews 7)

In Table 5.1 that FDI, Gross domestic product, BI rate, Inflation and Openness is not stationary in levels, it is necessary to continue to the test degree of integration 1st difference. The result of the degree of integration 1st difference shows that two variables (gross domestic product and BI rate ) in the 1st difference is not stationary but variable FDI, Gross domestic product, BI rate, Inflation and Openness. it is necessary to test the degree of integration 2nd difference. The result of the degree of integration 2nd difference seen that all the variables are taken in this study has been stationary.

If the degree of linear combinations of these variables is stationary, it can be said that these variables are cointegrated. To determine the cointegration relationship, continue to cointegration test.

### 5.1.2 Cointegration Test

Cointegration test is done by first ensuring that all variables used in the model has the same degree of integration. From the test results of all data in this study have the same degree of integration. Therefore, cointegration test can be performed.

Table 5.2 will be present the results of the cointegration test by using Johansen Cointegration Test.

**Table 5.2**  
**Result of Johansen Cointegration Test**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value
None *	95.27954	69.81889
At most 1 *	59.07863	47.85613
At most 2	28.05040	29.79707
At most 3	7.805283	15.49471
At most 4	1.288746	3.841466

Source : Data Procesed (Eviews 7)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value
None *	36.20091	33.87687
At most 1 *	31.02823	27.58434
At most 2	20.24512	21.13162
At most 3	6.516537	14.26460
At most 4	1.288746	3.841466

Source : Data Procesed (Eviews 7)

In Table 5.2 shows that there is cointegration between the variables that used in this study. It can be proven through a significance value of probability that

is smaller than the critical value of 5 percent. Another way that can be used is to look at the value of the Trace Statistic is greater than the critical values in Trace Test, and the value of the Max-Eigen Statistic is greater than the critical values in Maximum Eigenvalue Test. So that, the data cointegrated in Trace Test and Maximum Eigenvalue Test. It can be concluded that the variables used in this study mutually cointegrated. Therefore, this model passes from the test cointegration, Error Correction Model can be used in this study. Beside preliminary test, this study also tested the classic assumption test such as normality test, autocorrelation, heterocedastity, and multicollinearity.

## 5.2 Classical assumption

### 5.2.1 Multicollinearity

Multicollinearity test to see whether there is a perfect linear relationship among certainly or all of the independent variables from the regression model. The presence can be known multicollinearity of each independent variable if the correlation coefficient between each independent variable is greater than 0.8 it means that there is multicollinearity (Gujarati, 2011).

**Table 5.3**

#### Multikolinearity test

	GDP	INFLASI	BIRATE	OPPENESS
GDP	1.000000	-0.216729	-0.783150	-0.730498
INFLASI	-0.216729	1.000000	0.377128	0.301565
BIRATE	-0.783150	0.377128	1.000000	0.664823
OPPENESS	-0.730498	0.301565	0.664823	1.000000

Source: Data proceed (Eviews 7)

From table 5.3 Multicollinearity test results, it showing that for all independent variables did not reveal any Multicollinearity or perfect linear relationship among all the variables in the model. It is shown from the correlation coefficient of each independent variable is smaller than 0.8. It can be concluded that the variables in this study pass the Multicollinearity test.

### 5.2.2 Heterocedasticity Test

Heteroscedasticity test is performed to detect whether the observed data occurs Heterocedasticity or not is by testing White-Heteroscedasticity. If the probability value Obs \*R-Squared smaller than the real level means there is heteroscedasticity in the model. Meanwhile, if the value of the probability Obs \*R-Squared is greater than the real level, then there is no heteroscedasticity in the model. Real level used is 5%. Heteroscedasticity test results for the equation of direct foreign investment can be seen in Table 5.4 :

**Table 5.4**

**Heterocedasticity Test**  
**Heterocedasticity Test : White**

F-statistic	1.884356	Prob. F(4,55)	0.1262
Obs*R-squared	7.231597	Prob. Chi-Square(4)	0.1241
Scaled explained SS	14.63689	Prob. Chi-Square(4)	0.0055

Source: Data proceed (Eviews 7)

From table 5.4 above heterocedasticity test results, it can be seen that for foreign direct investment equation there is a problem heterocedasticity. It is shown from the value of the probability Obs \*R-Squared larger than that used real level of 5%, ie  $0.123 > 0.05$ . so it can conclude that foreign direct investment to the equation there is no heterocedasticity problem.

### 5.2.3 Autocorrelation test

The test is used to detect whether the observed data occurs autocorrelation or not is by testing Breusch-Godfrey Serial Correlation LM Test. If the probability value Obs \*R-squared smaller than the real level then found autocorrelation in the model. Meanwhile, if the value of the probability Obs \*R-Squared is greater than the real level, then there were no autocorrelation in the model. Significance level used was of 5%. Results of autocorrelation test for equality of foreign direct investment and foreign portfolio investment can be seen in Table 5.5

**Table 5.5**

**Autocorrelation Test  
Breusch-Godfrey serial correlation test**

F-statistic	2.314533	Prob. F(2,53)	0.1087
Obs*R-squared	4.819512	Prob. Chi-Square(2)	0.0898

Source: Data proceed (Eviews 7)

Based on table 5.5 Autocorrelation test results above, it can be seen that for foreign direct investment equation, there are no autocorrelation. It is shown from the value of the probability Obs \*R-Squared larger than that used real level of 5% ie  $0.089 > 0.05$  so that it can be concluded that foreign direct investment to the equation there is no Autocorrelation problem.

### 5.3 Estimation Result of Error Correction Model (ECM)

After the stationary test and cointegration, it is necessary to know how the results of short run and long run regression and model estimation. Short run regression model in this study using the first difference and using variables Error Correction Term (ECT). For long run regression model can calculate using a formulation as described in equation 3.11 and equation 3.12. The calculation of

the long run coefficient as well as t-statistic for these coefficients can be seen in Appendix.

**Table 5.6**  
**Estimation Result of Short Run and Long Run with Error Correction Model (ECM)**

Variable	Coefficient	t-Statistic	Significant
Short Run			
C	-0.263627	-0.110197	No Significant
D(GDP)	-2.602913	-0.765438	No Significant
D(BI_RATE)	-0.014003	-0.173446	No Significant
D(INFLATION)	-0.043633	-2.015767	Significant*
D(OPENNESS)	-1.694257	-1.456323	No Significant
GDP(-2)	-0.083453	-0.266215	No Significant
BI_RATE(-2)	-0.369416	-2.329822	Significant**
INFLATION(-2)	-0.402286	-2.417485	Significant**
OPENNESS(-2)	-0.265343	-0.260943	No Significant
ECT	0.368197	2.275289	Significant*
Long Run			
C	- 0.714	0.150	No Significant
GDP	0.774	1.716	Significant*
BI_RATE	- 0.002	-0.024	No Significant
INFLATION	-0.092	-0.920	No Significant
OPENNESS	0.279	0.140	No Significant
R-squared	0.231957	DW statistic	2.685423
Adjusted R-squared	0.087949	F-statistic	1.610721

**Note:**

\* = significant at  $\alpha = 5\%$  (value T-table at  $\alpha = 5\% = 1,645 < T\text{-test}$ )

\*\* = significant at  $\alpha = 1\%$  (value T-table at  $\alpha = 1\% = 2,326 < T\text{-test}$ )

Based on the table 5.6, it shows that only 8.79 % variables GDP, BI rate, Inflasi and Openness can explain the variable FDI in Indonesia . This condition

can be seen from the Adjusted R-squared 0.0879. The ECM model will be valid to see long term effects of economic variables being studied if ECT significant. The value must be greater than zero and less than one and not be negative (Syarid, 2004; Susilo and Arsyad, 2012; Nurwulandari and Fuadi, 2013; and Sarwedi, 2002).

From Table 5.6, it can be seen that the terms of the validity to use of empirical models in this study are met. ECT value shows that the proportion of the cost of an imbalance in the development of FDI in the previous period were adjusted in the current period is approximately 36.81%. In table 5.6 also shows significant ECT with the probability value less than alpha 0,05. ECT in ECM explains whether the model can be used as a long term analysis.

### **5.3.1 Analysis of Short Run**

Based on Table 5.6, it can be seen in the short term, variable Inflation  $D(INF)$  and BI rate  $D(BIRATE)$  significantly affect FDI at the level of trust 5 percent. This is explain from the value t-statistic of inflation is -2.015 and the value of t-table in alpha 5 % is 1.645. It is explain that t-statistic of Inflation has greater than t-table, it means, variable inflation has significant effect to FDI. Other variable that also significant is BI rate in second difference (lag 2). Whereas, the value t-statistic of BI rate is -2.329 and T-table in alpha 1 % is 2.326. It is explain that t-statistic of FDI has greater than t-table. It means, variable FDI has significant effect to FDI.

Two variables that significantly effect to FDI show that:

1. If an increase in the average Inflation in Indonesia amounted to 1 percent, it will be able to decrease the FDI around 0.043 billion rupiah.
2. If there is an average increase of BI rate in Indonesia amounted to 1 percent, it will be able to decrease the FDI around 0.369 billion rupiah.

In the short term these conditions shows that Inflation has a negative effect to FDI. This result is appropriate with the theory that increasing of Inflation will decrease foreign direct investment inflow. The result of this studies same as with the result of previous studies that Lozovyi & Kudina (2007) found in they study if inflation have a significant negative relationship with the foreign direct investment inflow.

In the short term these conditions shows that BI rate has a negative effect to FDI. This result is appropriate with the theory that changing of BI rate will changing amount of FDI. The result of this studies same as with the result of previous studies that Chow (2008), found in his study if BI rate have a significant negative relationship with the foreign direct investment inflow.

### **5.3.2 Analysis of Long Run**

Based on table 5.6, it can be seen that in the long run, variable Gross domestic product significantly affect FDI at the level of trust 5 percent. This is explain from the value t-statistic of gross domestic product is 1.716 and t-table in alpha 5% is 1.645. It is explain that the value t-statistic of variable gross domestic product has greater than t-table, it means, variable gross domestic product has significant effect to FDI in long run.

One variables that significantly effect to FDI show that If an increase in the average gross domestic product in Indonesia amounted to 1 billion, it will be able to raise the FDI around 0.774 billion rupiah.

In the long run these conditions shows that gross domestic product has a positive effect to FDI. This result is appropriate with the theory that increasing of gross domestic product will increase Foreign Direct Investment inflow. The result of this studies same as the result of previous studies that and Kishor *et al.* (2012). found in study case in Malaysia if gross domestic product have a significant positive relationship with foreign direct investment inflow.

## CHAPTER VI

### CONCLUSIONS AND RECOMMENDATIONS

Based on the empirical results of research and discussion from the previous chapter, the main objective of this research is to examine the impact of gross domestic product, BI rate, inflation and openness toward foreign direct investment in Indonesia over quarterly period 2000 to 2014. In this paper, the author used Error Correction Model (ECM) model to empirically test the impact of gross domestic product, BI rate, inflation and openness toward foreign direct investment inflow in Indonesia. From the analysis of data that has been conducted, it is obtained the following conclusions and recommendations.

#### **6.1 Conclusions**

1. Based on the regression model testing can be concluded that foreign direct investment in Indonesia over quarterly period 2000 – 2014 is influenced by gross domestic product, BI rate, inflation and openness about 23.19 percent. Other, 76.81 percent of foreign direct investment variation is explained by other variables which aren't in the model.
2. Based on research results that variable of inflation has negative and significant impact to FDI in short run : The Case of Indonesia over quarterly period 2000 – 2014. This shows that increase in Inflation will decrease the amount of FDI inflow in Indonesia.

3. Based on research results that variable BI rate has negative and significant impact on FDI in short run : The Case of Indonesia over quarterly period 2004 – 2014. This shows that the increase of BI rate will decrease the amount of foreign direct investment inflow in Indonesia.
4. Based on research results that variable gross domestic product has positive and significant impact on FDI in long run : The Case of Indonesia over quarterly period 2004 – 2014. This shows that the increase of gross domestic product will increase the amount of foreign direct investment inflow in Indonesia.

## **6.2 Recommendations**

Based on the study, it can be given Recommendations as follows:

1. Government should stimulate economic growth, where the government should to allocate of budget to develop in order to infrastructure to ensure stability and to stimulate production.
2. Bank of Indonesia should care to control interest rate that occur and to regulate it so tight by determine the interest rate in banking should not over than hint of interest rate Bank of Indonesia.
3. Bank of Indonesia should concern to control inflation in Indonesia, By controlling inflation willingness to invest from abroad probably indicated to increase.
4. For further research, it will be better if all relevant macroeconomic variables are included as factors affect the level of foreign direct investment and then compare to another developing countries.

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## APPENDIX

### The Variables Data Research Macroeconomics in Indonesia over Quarterly Period 2000Q1 – 2014Q4

Years	Quarter	FDI	GDP	BI rate	Inflation	Openness
2000	Q1	268	324232,0	11,03	7,0	0,59
	Q2	503	336314,0	11,43	6,4	0,67
	Q3	998	360783,2	13,57	6,5	0,75
	Q4	1054	368440,2	14,14	8,3	0,82
2001	Q1	1053	397956,4	15,04	9,2	0,76
	Q2	373	424077,4	16,36	5,4	0,77
	Q3	580	433905,2	17,47	7,3	0,62
	Q4	986	428341,5	17,60	6,5	0,59
2002	Q1	1165	449086,9	16,85	8,4	0,59
	Q2	3146	459993,4	15,74	5,7	0,57
	Q3	1954	480725,0	14,17	8,3	0,57
	Q4	2153	473469,4	13,03	7,4	0,58
2003	Q1	853	507143,0	12,11	7,8	0,54
	Q2	658	504874,8	10,34	7,3	0,53
	Q3	612	521275,1	8,89	6,4	0,51
	Q4	2278	512560,6	8,43	5,7	0,53
2004	Q1	348	540031,9	8,51	4,8	0,55
	Q2	409	568253,0	8,61	6,4	0,57
	Q3	348	594736,5	8,28	6,7	0,62
	Q4	791	600010,0	8,24	6,3	0,64
2005	Q1	1066	635102,8	8,20	7,8	0,62
	Q2	2885	673797,4	8,42	7,6	0,63
	Q3	1117	716600,7	9,08	8,4	0,65
	Q4	94	759459,5	12,00	17,8	0,61
2006	Q1	1305	782752,9	12,75	16,9	0,56
	Q2	1337	812741,1	12,58	15,5	0,58
	Q3	1710	870319,8	11,75	14,9	0,57
	Q4	3162	873403,0	10,25	6,1	0,56
2007	Q1	1061	920203,1	9,25	6,4	0,52
	Q2	1058	963862,5	8,75	6,0	0,54
	Q3	1532	1031408,7	8,25	6,5	0,55
	Q4	1920	1035418,9	8,17	11,5	0,57
2008	Q1	2360	1110032,3	8,00	7,6	0,59
	Q2	1633	1220605,9	8,25	10,1	0,61
	Q3	3388	1327509,6	9,00	12,0	0,58
	Q4	1937	1290540,6	9,42	11,5	0,56

2009	Q1	1904	1317409,4	8,25	8,6	0,44
	Q2	1441	1383350,6	7,25	5,7	0,44
	Q3	987	1456421,8	6,58	2,8	0,46
	Q4	540	1446689,2	6,50	2,6	0,49
2010	Q1	2983	1501126,1	6,50	3,7	0,46
	Q2	3350	1582918,1	6,50	4,4	0,46
	Q3	2955	1668352,8	6,50	6,2	0,46
	Q4	4483	1670521,2	6,50	6,3	0,52
2011	Q1	5311	1834355,1	6,67	6,8	0,48
	Q2	5034	1928233,6	6,75	5,9	0,51
	Q3	3469	2053745,4	6,75	4,7	0,49
	Q4	5428	2015392,5	6,17	4,1	0,53
2012	Q1	4518	2061338,3	5,83	3,7	0,49
	Q2	3568	2162036,9	5,75	4,5	0,51
	Q3	5964	2223641,6	5,75	4,5	0,46
	Q4	5803	2168687,7	5,75	4,4	0,52
2013	Q1	3840	2232478,4	5,75	5,3	0,47
	Q2	4558	2337789,2	5,83	5,6	0,48
	Q3	5929	2484363,8	6,92	8,6	0,46
	Q4	4620	2470105,1	7,42	8,4	0,54
2014	Q1	5097	2499877,6	7,50	7,8	0,50
	Q2	4928	2613108,6	7,50	7,1	0,49
	Q3	7593	2739466,4	7,50	4,4	0,46
	Q4	4658	2690240,9	7,67	6,5	0,49

Source: Bureau of Statistics Indonesia and Bank of Indonesia

### Unit Root Test (Stationerity) Level

Null Hypothesis: Unit root (individual unit root process)  
Series: FDI, GDP, BI\_RATE, INFLATION, OPENNESS  
Date: 07/28/15 Time: 13:10  
Sample: 1 60  
Exogenous variables: Individual effects  
Automatic selection of maximum lags  
Automatic lag length selection based on SIC: 0 to 5  
Total number of observations: 281  
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	23.2914	0.0097
ADF - Choi Z-stat	-2.15904	0.0154

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

#### Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
FDI	0.0086	0	10	59
GDP	0.8763	4	10	55
BI_RATE	0.2166	1	10	58
INFLATION	0.1657	4	10	55
OPENNESS	0.0323	5	10	54

### Unit Root Test (Stationerity) 1<sup>st</sup> Difference

Null Hypothesis: Unit root (individual unit root process)  
Series: FDI, GDP, BI\_RATE, INFLATION, OPENNESS  
Date: 07/28/15 Time: 13:11  
Sample: 1 60  
Exogenous variables: Individual effects  
Automatic selection of maximum lags  
Automatic lag length selection based on SIC: 0 to 4  
Total number of observations: 280  
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	104.861	0.0000
ADF - Choi Z-stat	-8.05234	0.0000

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

#### Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(FDI)	0.0000	0	10	58
D(GDP)	0.1656	3	10	55
D(BI_RATE)	0.0113	0	10	58
D(INFLATION)	0.0000	3	10	55
D(OPENNESS)	0.0001	4	10	54

## Unit Root Test (Stationarity) 2<sup>nd</sup> Difference

Null Hypothesis: Unit root (individual unit root process)  
 Series: FDI, GDP, BI\_RATE, INFLATION, OPENNESS  
 Date: 07/28/15 Time: 13:11  
 Sample: 1 60  
 Exogenous variables: Individual effects  
 Automatic selection of maximum lags  
 Automatic lag length selection based on SIC: 0 to 5  
 Total number of observations: 273  
 Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	185.788	0.0000
ADF - Choi Z-stat	-12.5048	0.0000

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

### Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(FDI,2)	0.0000	5	10	52
D(GDP,2)	0.0000	2	10	55
D(BI_RATE,2)	0.0000	0	10	57
D(INFLATION,2)	0.0000	3	10	54
D(OPENNESS,2)	0.0000	2	10	55

## Cointegration Test

Date: 07/28/15 Time: 13:15  
 Sample (adjusted): 3 60  
 Included observations: 58 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: FDI BI\_RATE GDP INFLATION OPENNESS  
 Lags interval (in first differences): 1 to 1

### Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.464285	95.27954	69.81889	0.0001
At most 1 *	0.414313	59.07863	47.85613	0.0031
At most 2	0.294645	28.05040	29.79707	0.0784
At most 3	0.106272	7.805283	15.49471	0.4864
At most 4	0.021975	1.288746	3.841466	0.2563

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 *	0.464285	36.20091	33.87687	0.0259

At most 1 *	0.414313	31.02823	27.58434	0.0173
At most 2	0.294645	20.24512	21.13162	0.0662
At most 3	0.106272	6.516537	14.26460	0.5478
At most 4	0.021975	1.288746	3.841466	0.2563

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):

FDI	BI_RATE	GDP	INFLATION	OPENNESS
-5.109334	0.388177	11.58242	-0.050021	12.15754
-1.812891	0.032846	-1.046468	-0.213730	-14.25815
-0.973316	-0.321184	2.273655	-0.178186	21.25471
-0.938141	-0.420090	-3.180446	0.280514	-2.451321
0.150746	-0.011832	3.415699	0.050465	-0.071778

Unrestricted Adjustment Coefficients (alpha):

D(FDI)	0.174258	0.071206	-0.027384	0.021192	-0.001893
D(BI_RATE)	-0.101541	0.025304	0.308003	0.006766	0.004857
D(GDP)	-0.001252	-0.002346	0.001976	0.002361	-0.001339
D(INFLATION)	-0.452088	0.552692	0.497469	-0.412615	-0.169493
D(OPENNESS)	-0.011213	0.016848	-0.002539	0.004434	0.001331

1 Cointegrating Equation(s):      Log likelihood      124.0222

Normalized cointegrating coefficients (standard error in parentheses)

FDI	BI_RATE	GDP	INFLATION	OPENNESS
1.000000	-0.075974	-2.266915	0.009790	-2.379477
	(0.01801)	(0.23150)	(0.01144)	(0.78621)

Adjustment coefficients (standard error in parentheses)

D(FDI)	-0.890343	(0.16658)
D(BI_RATE)	0.518808	(0.41528)
D(GDP)	0.006399	(0.00912)
D(INFLATION)	2.309869	(1.55474)
D(OPENNESS)	0.057289	(0.02392)

2 Cointegrating Equation(s):      Log likelihood      139.5363

Normalized cointegrating coefficients (standard error in parentheses)

FDI	BI_RATE	GDP	INFLATION	OPENNESS
1.000000	0.000000	1.467899	0.151748	11.07294
		(0.79649)	(0.04530)	(3.13731)
0.000000	1.000000	49.15907	1.868509	177.0660
		(10.9771)	(0.62431)	(43.2382)

Adjustment coefficients (standard error in parentheses)

D(FDI)	-1.019433	0.069982
	(0.16828)	(0.01209)
D(BI_RATE)	0.472934	-0.038585
	(0.44022)	(0.03163)

D(GDP)	0.010653 (0.00951)	-0.000563 (0.00068)
D(INFLATION)	1.307898 (1.59546)	-0.157336 (0.11464)
D(OPENNESS)	0.026745 (0.02192)	-0.003799 (0.00158)

3 Cointegrating Equation(s):            Log likelihood            149.6588

Normalized cointegrating coefficients (standard error in parentheses)

FDI	BI_RATE	GDP	INFLATION	OPENNESS
1.000000	0.000000	0.000000	0.108848 (0.02818)	4.377684 (1.10305)
0.000000	1.000000	0.000000	0.431812 (0.20652)	-47.15427 (8.08357)
0.000000	0.000000	1.000000	0.029225 (0.01317)	4.561117 (0.51562)

Adjustment coefficients (standard error in parentheses)

D(FDI)	-0.992779 (0.16966)	0.078777 (0.01555)	1.881555 (0.36501)
D(BI_RATE)	0.173150 (0.37896)	-0.137510 (0.03474)	-0.502281 (0.81527)
D(GDP)	0.008730 (0.00954)	-0.001198 (0.00087)	-0.007559 (0.02052)
D(INFLATION)	0.823703 (1.57491)	-0.317115 (0.14436)	-4.683578 (3.38815)
D(OPENNESS)	0.029216 (0.02219)	-0.002984 (0.00203)	-0.153274 (0.04773)

4 Cointegrating Equation(s):            Log likelihood            152.9171

Normalized cointegrating coefficients (standard error in parentheses)

FDI	BI_RATE	GDP	INFLATION	OPENNESS
1.000000	0.000000	0.000000	0.000000	4.981933 (1.17346)
0.000000	1.000000	0.000000	0.000000	-44.75715 (7.02104)
0.000000	0.000000	1.000000	0.000000	4.723356 (0.52064)
0.000000	0.000000	0.000000	1.000000	-5.551289 (10.4833)

Adjustment coefficients (standard error in parentheses)

D(FDI)	-1.012660 (0.17131)	0.069875 (0.02014)	1.814156 (0.37617)	-0.013111 (0.01221)
D(BI_RATE)	0.166803 (0.38438)	-0.140353 (0.04518)	-0.523800 (0.84404)	-0.053313 (0.02740)
D(GDP)	0.006514 (0.00950)	-0.002190 (0.00112)	-0.015070 (0.02086)	0.000874 (0.00068)
D(INFLATION)	1.210794 (1.56463)	-0.143780 (0.18392)	-3.371278 (3.43570)	-0.299899 (0.11153)
D(OPENNESS)	0.025057 (0.02224)	-0.004846 (0.00261)	-0.167375 (0.04883)	-0.001344 (0.00158)

## Estimation Result of Short Run with Error Correction Model (ECM)

Dependent Variable: D(FDI)

Method: Least Squares

Date: 07/28/15 Time: 14:26

Sample (adjusted): 3 60

Included observations: 58 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.263627	2.392320	-0.110197	0.9127
D(BI_RATE)	-0.014003	0.080737	-0.173446	0.8630
D(GDP)	-2.602913	3.400554	-0.765438	0.4478
D(INFLATION)	-0.043633	0.021646	-2.015767	0.0494
D(OPENNESS)	-1.694257	1.163380	-1.456323	0.1518
BI_RATE(-2)	-0.369416	0.158560	-2.329822	0.0241
GDP(-2)	-0.083453	0.313482	-0.266215	0.7912
INFLATION(-2)	-0.402286	0.166407	-2.417485	0.0195
OPENNESS(-2)	-0.265343	1.016862	-0.260943	0.7953
ECT	0.368197	0.161824	2.275289	0.0274
R-squared	0.231957	Mean dependent var		0.016666
Adjusted R-squared	0.087949	S.D. dependent var		0.331331
S.E. of regression	0.316426	Akaike info criterion		0.692130
Sum squared resid	4.806016	Schwarz criterion		1.047379
Log likelihood	-10.07177	Hannan-Quinn criter.		0.830507
F-statistic	1.610721	Durbin-Watson stat		2.685423
Prob(F-statistic)	0.139075			

## Estimation Result of Long Run with Error Correction Model

Variabel	Parameter Prob
Constant	$f_0 = -0.263/0.368 = -0.714$
BI_rate	$f_1 = (-0.369 + 0.368) / 0.368 = -0.002$
GDP	$f_2 = (-0.083 + 0.368) / 0.368 = 0.774$
Inflation	$f_3 = (-0.402 + 0.368) / 0.368 = -0.092$
Openness	$f_3 = (-0.265 + 0.368) / 0.368 = 0.279$

**Result of Matrix Varians – Covarians , Varians , Standard Error, and T-test with Error**

**Correction Model (ECM)**

Variabel	Vector $F_i^T$	Matrik Var-Cov ECM	Vector $F_i$	Varians	Standar Error	T-test
Constant	[2.717 1.940]	$\begin{bmatrix} 0.026 & -0.137 \\ -0.137 & 5.723 \end{bmatrix}$	$\begin{bmatrix} 2.717 \\ 1.940 \end{bmatrix}$	20.287	4.504	-0.150
Blrate	[2.717 - 2.722]	$\begin{bmatrix} 0.026 & -0.025 \\ -0.025 & 0.025 \end{bmatrix}$	$\begin{bmatrix} 2.717 \\ 2.722 \end{bmatrix}$	0.007	0.083	-0.024
GDP	[2.717 0.614]	$\begin{bmatrix} 0.026 & 0.009 \\ 0.009 & 0.098 \end{bmatrix}$	$\begin{bmatrix} 2.717 \\ 0.614 \end{bmatrix}$	0.204	0.451	1.716
Inf	[2.717 2.967]	$\begin{bmatrix} 0.026 & -0.026 \\ -0.026 & 0.027 \end{bmatrix}$	$\begin{bmatrix} 2.717 \\ 2.967 \end{bmatrix}$	0.010	0.100	0.920
Open	[2.717 1.959]	$\begin{bmatrix} 0.026 & -0.022 \\ -0.022 & 1.034 \end{bmatrix}$	$\begin{bmatrix} 2.717 \\ 1.959 \end{bmatrix}$	3.924	1.980	0.140

## Multicollinearity test

	GDP	INFLASI	BIRATE	OPPENESS
GDP	1.000000	-0.216729	-0.783150	-0.730498
INFLASI	-0.216729	1.000000	0.377128	0.301565
BIRATE	-0.783150	0.377128	1.000000	0.664823
OPPENESS	-0.730498	0.301565	0.664823	1.000000

## White Heteroskedasity Test

Heteroskedasticity Test: White

F-statistic	1.884356	Prob. F(4,55)	0.1262
Obs*R-squared	7.231597	Prob. Chi-Square(4)	0.1241
Scaled explained SS	14.63689	Prob. Chi-Square(4)	0.0055

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 06/05/15 Time: 15:56

Sample: 2000Q1 2014Q4

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.406566	0.386309	1.052439	0.2972
BIRATE^2	-0.000124	0.000385	-0.322582	0.7482
GDP^2	-0.009557	0.008944	-1.068476	0.2900
INFLASI^2	0.000721	0.000311	2.319699	0.0241
OPPENESS^2	-0.089998	0.268600	-0.335064	0.7389
R-squared	0.120527	Mean dependent var		0.066738
Adjusted R-squared	0.056565	S.D. dependent var		0.147718
S.E. of regression	0.143479	Akaike info criterion		-0.965599
Sum squared resid	1.132244	Schwarz criterion		-0.791070
Log likelihood	33.96797	Hannan-Quinn criter.		-0.897331
F-statistic	1.884356	Durbin-Watson stat		2.104472
Prob(F-statistic)	0.126198			

## Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.314533	Prob. F(2,53)	0.1087
Obs*R-squared	4.819512	Prob. Chi-Square(2)	0.0898

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 06/06/15 Time: 17:56

Sample: 2000Q1 2014Q4

Included observations: 60

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-0.028540	0.218813	-0.130433	0.8967
BIRATE	0.000642	0.018135	0.035407	0.9719
INFLASI	0.001716	0.012187	0.140789	0.8886
OPPENESS	-0.174064	0.632433	-0.275228	0.7842
C	0.248846	1.580710	0.157427	0.8755
RESID(-1)	0.265197	0.136777	1.938895	0.0578
RESID(-2)	-0.182190	0.135791	-1.341690	0.1854

R-squared	0.080325	Mean dependent var	-1.90E-15
Adjusted R-squared	-0.023789	S.D. dependent var	0.260517
S.E. of regression	0.263597	Akaike info criterion	0.280492
Sum squared resid	3.682627	Schwarz criterion	0.524832
Log likelihood	-1.414766	Hannan-Quinn criter.	0.376067
F-statistic	0.771511	Durbin-Watson stat	2.056383
Prob(F-statistic)	0.595743		

## Multicolinearity test

	GDP	INFLASI	BIRATE	OPPENESS
GDP	1.000000	-0.216729	-0.783150	-0.730498
INFLASI	-0.216729	1.000000	0.377128	0.301565
BIRATE	-0.783150	0.377128	1.000000	0.664823
OPPENESS	-0.730498	0.301565	0.664823	1.000000

## White Heteroskedasity Test

Heteroskedasticity Test: White

F-statistic	1.884356	Prob. F(4,55)	0.1262
Obs*R-squared	7.231597	Prob. Chi-Square(4)	0.1241
Scaled explained SS	14.63689	Prob. Chi-Square(4)	0.0055

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 06/05/15 Time: 15:56

Sample: 2000Q1 2014Q4

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.406566	0.386309	1.052439	0.2972
BIRATE^2	-0.000124	0.000385	-0.322582	0.7482
GDP^2	-0.009557	0.008944	-1.068476	0.2900
INFLASI^2	0.000721	0.000311	2.319699	0.0241
OPPENESS^2	-0.089998	0.268600	-0.335064	0.7389
R-squared	0.120527	Mean dependent var		0.066738
Adjusted R-squared	0.056565	S.D. dependent var		0.147718
S.E. of regression	0.143479	Akaike info criterion		-0.965599
Sum squared resid	1.132244	Schwarz criterion		-0.791070
Log likelihood	33.96797	Hannan-Quinn criter.		-0.897331
F-statistic	1.884356	Durbin-Watson stat		2.104472
Prob(F-statistic)	0.126198			