Analysis of Foreign Direct Investment toward Employment in Indonesia, Period 1985 to 2017

A THESIS

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DECLARATION OF AUTHENCITY

Herein, I declare the originality of the thesis; I have not presented anyone else's work to obtain my university degree, nor have I presented anyone else's words, ideas or expression without acknowledgement. All quotations are cited and listed in the bibliography of the thesis.

If in the future this statement is proven to be false, I am willing to accept any sanction complying with the determined regulation or its consequence.

Yogyakarta, March 15th, 2019

Toshi Fikriansyah

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ABSTRACT

The massive inflows of FDI recently bring up opportunities for Indonesia to open new job vacancies and absorb a huge number of employee. This study is going to estimate and learn the significance of FDI and two other macroeconomics components, which are GDP and export, toward the employment in both short-term and long-term relationships using Error Correction Model (ECM) approaches as an analysis technique. Simultaneously Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Export as variables have influences toward Employment, either in the long-term or short-term. However, individually Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Export as variables have mixed results and different influences toward Employment.

Keywords: Foreign Direct Investment, FDI, Investment, Employment.

ABSTRAK

Aliran masuk FDI yang sangat besar baru-baru ini membuka peluang bagi Indonesia untuk membuka lowongan pekerjaan baru dan menyerap sejumlah besar tenaga kerja. Studi ini akan memperkirakan dan mempelajari signifikansi FDI dan dua komponen ekonomi makro lainnya, yaitu PDB dan ekspor, terhadap ketenagakerjaan dalam hubungan jangka pendek dan jangka panjang dengan menggunakan pendekatan Error Correction Model (ECM) sebagai teknik analisis. Secara simultan Penanaman Modal Asing (PMA), Produk Domestik Bruto (PDB) dan Ekspor sebagai variabel memiliki pengaruh terhadap Ketenagakerjaan, baik dalam jangka panjang atau jangka pendek. Namun, secara individual Produk Domestik Asing (FDI), Produk Domestik Bruto (PDB) dan Ekspor sebagai variabel memiliki hasil yang beragam dan pengaruh yang berbeda terhadap Ketenagakerjaan.

Keywords: Investasi Asing Langsung, FDI, Investasi, Tenaga Kerja.

CHAPTER I

INTRODUCTION

1.1 Background

Haavelmo (1960) defined investment is “the transfer of a certain amount of wealth from one ownership, or employment, to another.” Investment decision which is currently made will simultaneously affect the future result, either positively or negatively, which indeed according to the economic perspective is that investment would end up with positive return for both parties, either source party (investor) or invested party. In some cases of investment would end up otherwisely, which are not all investments would end up with positive return since a lot of factors which could affect the future result.

According to Jones (2004), there are two types of investment, which are direct investment and indirect investment. Direct investment allows the investors to get involved and control their composition of investment and indirect investment only allows the investors to control their shares of the fund.

Meanwhile, Foreign Direct Investment (FDI) is a process of source country, that provides the resources, acquires ownership of assets for the purpose of the production control, distribution and other activities of a firm in host country. The United Nations (1999) World Invesment Report (UNCTAD, 1999) defined Foreign Direct Investment (FDI) as ‘an investment involving a long-term relationships and reflecting a lasting interest and control of a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other

than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)'. While, Prof. M. Sornarajah (in Sutrisno & S. Salim, 2008) defined investment as "transfer of tangible or intangible assets from one country to another for the purpose of being used in the country to generate wealth under the total or partial control of the owner assets."

Recently Indonesia faces up in the situation which Indonesia becomes a target of investors to put investment in Indonesia, because Indonesia was classified as one of emerging markets. Related to the direct investment realization, Badan Koordinasi Penanaman Modal (2018) reported "in Q4 (October-December) 2017 reached Rp 179.6 Trillion, up to 12.7% compared to the same period of the previous year that reached Rp 159.4 Trillion. While PMDN (Penanaman Modal Dalam Negeri or Domestic Direct Investment) and PMA (Penanaman Modal Asing or Foreign Direct Investment) realization during January-december 2017 hit Rp 692.8 Trillion, surpassing the 2017 target which is Rp 678.8 Trillion."

Employment is a condition where one party whose work for payment is the employee and in another hand whose offer a contract or payment for a job is the employer, which could be individual, corporation, organization, government or other sort of entity. The total number of employment is the number of person in a given group of a population employed, which is resulted from substraction between the total number of labour force and total number of unemployment.

Keynes (1936) assumed "changes in employment in response to changes in the rate of investment". Indonesia Investments (2017) reported "Indonesia collected

IDR 159.4 trillion in total investment realization (covering both FDI and DDI), up 9.6 percent (y/y) compared to realization in the preceding year. It resulted in an additional 434,466 employment opportunities in Indonesia in Q4-2016". This minor result was unseparated from Jokowi's, as the President of Indonesia, policy that emphasized the FDI inflows into the development of infrastucture sector during his era.

Recently in a study written by Baokye-Gyasi & Li (2015) mentioned that the increase in infrastructure sector had a negative significance on employment growth, meaning that rapid infrastructure development cannot be translated into the absorption of employment. Eventhough the number of employment was increase back then, but in the other side also followed by the increase of unemployment rate in the next year as reported by Statista in a titled web article "Indonesia : Unemployment rate from 2007 to 2017" where in 2017 the unemployment rate rose by 0.06%. This is also in line with the assumption of Todaro & Smith (2000) that explained the negative relationship between FDI and employment rate, since investment was an accumulation of capital it makes affordable to replace the technology by machine, which it could stimulate the rise of unemployment.

The relationships between investment and employment was stated by Sukirno (2000) that investment activities give a possibility to the society to keep continuing in improvement of economy activities and the absorption of employment, improve the national income and social welfare, have positive significance toward the absorption of employment.

Nevertheless this assumption has still been criticized by some economists by considering the relationship of those variables can be, either, significant or insignificant in some circumstances. In order to improve the efficiency of unemployment alleviation by utilizing FDI as one of the instruments, thus in this study involves the other of macroeconomics factors, which are Growth Domestic Product (GDP) and Export, to analyze the influences toward employment.

1.2 Problem Identification

The massive inflows of FDI recently bring up opportunities for Indonesia to open new job vacancies and absorb a huge number of employee. With more than 260 million of population, it is estimated around 60 percent of employment in Indonesia could be classified as informal. Majority of this informal employment is concentrated in the rural areas, particularly they work on construction and agriculture sectors, while Jokowi's regime also was focusing the investment inflows to develop the infrastructure. Infrastucture has an important role for developing economies because this sort of strategy was in purpose to attract and stimulate more DDI and FDI inflows in Indonesia. According to the data provided by the World Bank recently in 2017, FDI inflows of Indonesia was growing 386.12%, this is a great achievement if compared to 2016 when the FDI growth was slowed down in the last quarter and ended up in minus 77.04%. At the same year, a datum from Badan Pusat Statistik (BPS) showed the number of employment in Indonesia is 121.02 million employee, which are recorded in Survey Tenaga Kerja Nasional (Sakernas), with the growth of 2.2%.

This study is going to estimate and learn the significancy of FDI and two other macroeconomics components, which are GDP and export, toward the employment in both short-term and long-term relationships.

1.3 Problem Formulation

The problem formulation in this study contains:

1. Does Foreign Direct Investment (FDI) have a positive relationship, either in short-term or in long-term, toward the employment in Indonesia?
2. Does Growth Domestic Product (GDP) have a positive relationship, either in short-term or in long-term, toward the employment in Indonesia?
3. Does Export have a positive relationship, either in short-term or in long-term, toward the employment in Indonesia?

1.4 Problem Limitation

The limitation of this study is that the researcher cannot fulfill all of the resources demanded such as the range of data and the type of data, which is annual data. Moreover, the studies related to this study in Indonesia are not many. Therefore, the researcher complements this study with some studies of other countries which having similarities in characteristics that represent approximately equal to Indonesia. Also, the independent variables of this study exclude Domestic Direct Investment (DDI) inflow and only focus on Foreign Direct Investment (FDI), simultaneously with Growth Domestic Product (GDP) with constant price of 2010 and Export variables.

1.5 Research Objectives

From the problem statement, the research ojectives are:

1. To analyze and understand the relationship of Foreign Direct Investment (FDI), either in short-term or in long-term, toward the employment in Indonesia.
2. To analyze and understand the relationship of Growth Domestic Product (GDP), either in short-term or in long-term, toward the employment in Indonesia.
3. To analyze and understand the relationship of Export, either in short-term or in long-term, toward the employment in Indonesia.

1.6 Research Contributions

1. To the researcher, this thesis is one of the requirements in order to achieve Bachelor Degree of Economics in Faculty of Economics, Islamic University of Indonesia.
2. To the Government or policymakers, this study could be as a consideration to make a better policy which focus on employment and investment for the better employment distribution and improve the absorption of employment in Indonesia.
3. To the development of knowledge, this study could be one of the references and enrich the information for researches in the future.

1.7 Systematics of Writing

Chapter I will bring the foreinformation as an introduction, this chapter presents Introduction, Problem Formulation, Problem Limitation, Research Objectives, Research Contribution, and Writing Systematics. Next discussion in Chapter II of Review of Related Literature will discuss theoritically the brief concepts of FDI, GDP and Export separately regards to employment, factors, relationship between variables and references to research problem being examined. By the end of this chapter, hypotheses analysis is presented based on the literature of journal review. Continued by discussion of Chapter III that explains the Research Method and describes the type and objective of this study, sample data, data collection method, research variables, and analysis technique. Next in Chapter IV contains the explanation of Data Analysis and Discussions, this chapter discusses and analyses the data in hypotheses testing, interpretation of economic analysis and research findings. Last but not least, Chapter V will end up with Conclusions and Recommendations that shows the result and presents the conclusions, research limitations, and recommendations for institution and future researchers.

CHAPTER II

LITERATURE AND THEORETICAL REVIEW

2.1 Literature Review

Shun Pinn, et al. (2011) in their research had conducted a research that consist variables of total employment and inward FDI with ARDL bounds testing approach to cointegration. The research's objective was to explain the causal relationship between total employment and FDI in Malaysia, in period from 1970 to 2007. Back then, they found the relationship between employment and FDI that the FDI has a significant influence and contribution toward the total employment in Malaysia, but on the other hand the total employment has an insignificat influence toward FDI.

The previous statement is also in line with the study by Megbowon, Ngarava, & Mushunje (2016). The first of objectives of study is to examine the existence of long-run relationship between FDI inflow and employment and between FDI inflow and capital formation. Secondly, the objecive is to explore the causality relationship between employment and capital formation in relation to FDI inflows. The variables of this study consist of FDI, gross capital formation, employment, gross saving and inflation covering the period 1980-2014 and used ARDL approach as the analytical techniques. The study concluded that relationship of FDI inflow toward employment has a positive effect but the effect is not significant in the long-run.

In another study by Baokye-Gyasi & Li (2015), it focused on the contribution of China's FDI on employment generation in the building and

construction sector of Ghana. The study used questionnaires and divided the variables into eight, which are increase in employment and increase in low skills as the dependent variable, and economic growth, improvement in infrastructure, access to financial packages, provision of cost effective projects, reduction in occupational health, provision of modern infrastructure as the indeoendent variables. The researchers used a robust regression model as the analytical techniques in this study. The study showed a positive and significant effect on the total number of employment through Chinese FDI flows in building and construction sector. Nonetheless in this study also found that the increasing in infrastructure sector had a negative significancy on employment growth, which means rapid infrastructure development was not translated into the absorption of employment.

Sari, et al. (2015) in their study had aimed to determine the influence of the growth of Domestic Investment and Foreign Direct Investment on employment in Central Java with the period of data between 1985 to 2014. This study used the multiple linear regression with the variables of number of employment, domestic investment and Foreign Direct Investment. Thus, it can be concluded that FDI has a significant but negative effect on employment in Central Java. The study also added that the negative relationship between FDI and the absorption of employment was because of the country's characteristics between the home country and host country. The majority of the FDI realization led to the scheme where the home country, which has a base characteristic of capital abundant country, would like to

implement the capital abundant base method into their investment or FDI in the host country, which has a base characteristic of labour abundant country.

2.2 Theoretical Review

The relationships between investment and employment was stated by Sukirno (2000) that invesment activities give a possibility to the society to keep continuing in improvement of economy activities and the absorption of employment, improve the national income and social welfare, have positive significance toward the absorption of employment.

Vacaflores, et al. (2017) explained that the effects of growth in FDI will enhance job vacancies in the host countries perceived by the policymakers. Thus, Multinational Corporations (MNCs) with incentives for FDI were targeted by many host countries. In the same article, Vacaflores et al. also categorized the potential of MNC's to generate employment through: "(a) direct hiring of workers at foreign subsidiaries, (b) indirect employment effects through links with suppliers, as well as with affiliates attracted to the country by their entry, and (c) through their contribution towards higher incomes, which can increase employment through the multiplier effect."

Shun Pinn, et al. (2011) mentioned that the FDI can have a positive significance on employment. In some others, FDI has insignificant effect on employment, but somewhat the study sometimes may have a mixed result. Nevertheless, they derived that there are three scenarios of FDI toward employment that might happen: "(1) FDI inflow can increase employment directly through creation of new business or indirectly by stimulating employment in the distribution

stage of production, (2) FDI can maintain employment by acquiring and restructuring the existing firms, (3) FDI can reduce employment through disinvestment and the closure of domestic firms for developing countries." Related to the effect of FDI in some countries probably it is true that FDI can have positive significance on employment while in some others FDI has insignificant effect on employment. Somewhat, the study has a mixed result.

The negative relationships between investment and the employment havee been assumed and explained by Todaro & Smith (2000) since investment was an accumulation of capital it makes affordable to replace the technology by machine, which it could stimulate the rise of unemployment.

2.3 Hypotheses

Based on the problem formulations and the research objectives, therefore the researcher proposes alternative hypotheses as follows:

1. Foreign Direct Investment (FDI) has a positive relationship toward the employment.
2. Gross Domestic Product (GDP) has a positive relationship toward the employment.
3. Export has a positive relationship toward the employment.

CHAPTER III

RESEARCH METHOD

3.1 Type of Study

This study is a quantitative research, which is used to learn or forecast the behaviors and patterns of the variables by estimating the given of numerical data collection, and using the collection of time series data. As explained by Widarjono (2013) that the success of econometrics analysis depends much on the availability of the data, while a collection of observations in a certain range of time and collected in the interval of time constantly –such as weekly, monthly, quarterly and annually data –is calssifed as a time series data.

3.2 Data Collection Method

The researcher is using secondary data, which is the primary data collected by someone else, with annual series of time from 1985 up to 2017. Data were well-provided via electronical sources by some particular government institutions and international organizations, which have focus and are well-known on the data mining. The methods used by the researcher in collecting the data are as follows:

1) Library Research

Library research is learning and collecting the secondary data through various literature and other paper-based media for the purpose of obtaining the relevant data.

2) Field Research

Field research is collecting secondary data through parties or institution related to this study such as Badan Pusat Statistik (BPS).

3) Internet Research

Internet Research is collecting information from various studies or research of certain reliable publishers and collecting secondary data from other parties or institutions via internet, such as www.bps.go.id and www.worldbank.org.

Table 3. 1

Summary of Data Collection

No	Variable	Measurement	Source of Data	Site Address
1.	*N* (total number of employment)	Number of persons in million	Badan Pusat Statistik	www.bps.go.id
2.	FDI	Million US $	World Bank	www.worldbank.org
3.	GDP	Million US $	World Bank	www.worldbank.org
4.	Export	Million US $	Badan Pusat Statistik	www.bps.go.id

3.3 Variables of Research

3.3.1 Employment

Persons in employment comprises of all persons above a specified age for measuring the economically active popuplation (e.g. 15 years) who during a specified short period, either one week or one day, were in paid employment or self employment. (International Labour Organization, 1993)

The total number of employment is the number of person in a given group of a population which are employed, which is resulted from substraction between the total number of labour force and total number of unemployment.

3.3.2 Foreign Direct Investment (FDI)

The United Nations 1999 World Invesment Report (UNCTAD, 1999) defines Foreign Direct Investment (FDI) as 'an investment involving a long-term relationships and reflecting a lasting interest and control of a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate).'

Foreign Direct Investment (FDI) is a process of source country, that provides the resources, acquires ownership of assets to control the production, distribution and other activities of a firm in host country. FDI also becomes an indicator of the openness of global economy for a country and utilizes it as an instruments to improve the employment absorption as well as the improvement of economy well-being in host country, which FDI inflow brings capital accumulation

toward host country to provide the new employment through various investment realization.

3.3.3 Gross Domestic Product (GDP)

According to Mankiw (2009), "Gross domestic product (GDP) is the market value of final goods and services produced within an economy in a given period of time". In many studies, GDP is measured as economy performance of a country. Thus, the rise of GDP could stimulate to the inclining of production factors which employment is included.

3.3.4 Export

Mankiw (2009) defined export is a surplus of production, either goods or services, that sold to the foreign countries. Many economists expect that export may have a significant and positive relationship toward employment, because the increase in export is associated with increasing of production which comes up with an assumption that it will elaborate with the demand of labour.

3.4 Analysis Techniques

3.4.1 Error Correction Model (ECM)

Widarjono (2013) explained that the majority of spurious regression or doubtful regression was resulted from time series data which is non-stationary. Spurious regression is a situation where the result of regression shows a coefficient of regression, which is significant by model, was not correlated. For the time series data which is non-stationary, Error Correction Model (ECM) is the appropriate model. Data which is non-stationary most of the time shows imbalance

relationships in short-term, even though there is a tendency of imbalance relationships in long-term might happen.

Below is the long-term estimation model of the total number of employment into form of linear which is used in this study:

$$\ln N_t = \alpha_0 + \alpha_1 lnN_t + \beta_1 lnFDI_t + \beta_2 lnGDP_t + \beta_3 lnExp_t + \varepsilon_t \quad (3.1)$$

Where;

$\ln N_t$ is the total number of employment

$lnFDI_t$ is Foreign Direct Investment

$lnGDP_t$ is Gross Domestic Product

$lnExp_t$ is Export

ε_t is white noise error

α_t and β_t is coefficient of long-term regression

While, for the short-term estimation model Engle-Granger ECM approach was used in this study as follows:

$$\Delta \ln N_t = \alpha_0 + \alpha_1 \Delta lnN_t + \beta_1 \Delta lnFDI_t + \beta_2 \Delta\, lnGDP_t + \beta_3 \Delta Exp_t + ECT_t + \varepsilon_t \quad (3.2)$$

Where;

Δ is changes or difference

ECT_t is Error Correction Term

3.4.1.1 Stationarity Test

According to Widarjono (2013) time series data be said stationary if the mean, variance and covariance of each lag is constant in each time. The method to test the problem of stationarity is by using a unit root test.

To avoid estimating a spurious regression, this study will conduct the unit root test to test the presence of non-stationary variables. This test is intended to find out whether the data are I(0) or I(1) or I(*n*). Various tests can be used such as Dickey-Fuller test, Augmented Dickey-Fuller test, or Phillipps-Perron test.

This study used Augmented Dickey-Fuller (ADF) test to conduct a unit root test. Dickey –Fuller suggested to regress some models as follows:

$$\Delta Y_t = \phi Y_{t-1} + e_t \quad (3.3)$$

$$\Delta Y_t = \beta_1 + \phi Y_{t-1} + e_t \quad (3.4)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \phi Y_{t-1} + e_t \quad (3.5)$$

Where t is time trend of the variable.

Then, for the ADF (Augmented Dickey-Fuller) test can be expressed as follows:

$$\Delta Y_t = \gamma Y_{t-1} + \Sigma_{i=2}^{p} \beta_1 \Delta Y_{t-i+1} + e_t \quad (3.6)$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \Sigma_{i=2}^{p} \beta_1 \Delta Y_{t-i+1} + e_t \quad (3.7)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 T + \gamma Y_{t-1} + \Sigma_{i=2}^{p} \beta_1 \Delta Y_{t-i+1} + e_t \quad (3.8)$$

Where: Y=observed variables; $\Delta Y_t = Y_t - Y_{t-1}$ dan T = trend of time

In ADF test, the unit root test length of lag can use, either, Akaike Information Criterion (AIC) or Schwartz Information Criterion (SIC) or other criterions. The value of ADF statistics is compared with the value of its critical in order to know whether the data is stationary or not, with the scenarios as follows:

1. If the value of ADF > the critical value, therefore the data is stationary.
2. If the value of ADF < the critical value, therefore the data is non-stationary.

The non-stationary data can become stationary by estimating a test in different level of difference or degree of integration test. The tests is conducted to know whether the data is stationary at which degree of integration or at which level of difference.

A classiscal assumption test is conducted in order to obtain Best Linear Unbiased Estimator (BLUE). The classical assumption tests needed are (1) auto-correlation test, (2) heteroscedasticity test and (3) normality test. Thus if one of the estimators is found non-linear or bias, it can end up with invalid result.

3.4.1.2 Cointegration Test

Cointegration test is conducted in order to see an indication of the possibilty of long-term relationships between variables of economy which are used in this study. If the variable indicates cointegration in the same level therefore it has long-term relationships, otherwise it has no long-term relationship.

One of the tests which is used to know the indication of cointegration of several variables is a test that is developed by Johansen. In order to understand the

Johansen test, it can be seen the instances of the autoregressive model with p order as follows:

$$Y_t = A_t Y_{t-1} + \cdots + A_p Y_{t-p} + BX_t + e_t \quad (3.9)$$

Where Y_t is k vector of I(1) non-stationary variable, X_t is d vector of deterministic variable and e_t is inovative vector.Then, the equation was rewritten as follows:

$$\Delta Y_t = \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-1} + \Pi Y_{t-k} + BX_t + e_t \quad (3.10)$$

$$\text{Where } \Pi = \sum_{i=1}^{p} A_i - 1 \text{ dan } \Gamma = \sum_{j=1+1}^{p} A_j \quad (3.11)$$

The existence of cointegration is based on likelihood ratio (LR) test. If the value of LR statistics is more than the value of LR critical so that several variables has cointegration. Otherwise, if the value of LR statistics is less than the value of LR critical therefore the variable has no cointegration. The value of LR statistics is estimated based on formula as follows:

$$Q_t = -T \sum_{i=r+1}^{k} \log(1 - \lambda_i) \quad (3.12)$$

For r = 0,1,..., k –1 where $\lambda_i$is the maximum eigenvalue of i statistics. If the trace statistics is higher than the critical value (at α= 1%, 5%, 10%) so that there is cointegration between variables. Otherwise if trace statistics is less than the critical value (at α= 1%, 5%, 10%), then there is no cointegration between variables (Widarjono, 2013).

3.4.2 Classical Assumption Test

3.4.2.1 Auto-correlation Test

Auto-correlation means that there is a correlation between observations in different of time. According to the assumption of Ordinary Least Square (OLS) method, auto-correlation is a correlation between one of disturbance variables with the other disturbance variables. While, in OLS method it is important for the disturbance variables to have no correlation between one and another (Widarjono, 2013).

The researcher used Breusch-Godfrey method, or better known as Lagrange Multiplier (LM) test, to know the existence of auto-correlation in this study.

The LM test can be instanced as simple regression model as follows:

$$Y_t = \beta_0 + \beta_1 X_t + e_t \tag{3.13}$$

Assume the model of residual is following the Autoregressive model with p order or AR (p) as follows:

$$e_t = p_1 e_{t-1} + p_2 e_{t-2} + \cdots + p_p e_{t-p} + v_t \tag{3.14}$$

Where v_t meet the requirements of assumption for OLS which are $E(v_t) = 0$; $var\ (v_t) = \sigma^2$; dan $cov(v_t, v_{t-1}) = 0$. Then for the null hypothesis of model of AR (p) can be formulated as follows:

$$H_0: p_1 = p_2 = \cdots = p_p = 0 \tag{3.15}$$

$$H_\alpha: p_1 \neq p_2 \neq \cdots \neq p_p \neq 0$$

If the result was fail to reject H_0 then it can be said that there is no auto-correlation in the model.

One of the procedures for LM test is by regressing the residual of $\hat{e}_t$ with the independent variable of X_t (if there are more than one independent variable then input all of the independent variables simultaneously) and lag of residual $e_{t-1}, e_{t-2}, \dots, e_{t-p}$. This test can be expressed as follows:

$$\hat{e}_t = \lambda_0 + \lambda_t X_t + p_1 \hat{e}_{t-1} + p_2 \hat{e}_{t-2} + \cdots + p_p \hat{e}_{t-p} + v_t \qquad (3.16)$$

Then R^2 can be found from the regression of (3.16).

The decision, whether the estimators contain auto-correlation or not, much depends on the lag chosen. Akaike and Schwarz criterion is used to know the length of residual lag. The scenarios to know the existence of auto-correlation are explained as follows:

1. If (R^2) statistics > (R^2) critical in a certain level of significance (α) accordingly reject H_0. In conclusion, the model has auto-correlation problem.
2. If (R^2) statistics < (R^2) critical in certain level of significance (α) accordingly do not reject H_0. In conclusion, the model has no auto-correlation problem.

3.4.2.2 Heteroscedasticity Test

Widarjono (2013) mentioned that regression model which contains heteroscedasticity has several consequences toward the estimators in OLS method,

since the estimator is no longer BLUE. If the mean of disturbance variables is not zero, therefore it has no effect toward the slope but would still affect the intercept.

The researcher used Breusch-Pagan test in order to know whether the estimator in this study contains heteroscedasticity or not. Null hypothesis in this test shows that the model, which is used, has no heteroscedasticity problem.

The Breusch-Pagan method can be simply assumed as follows:

$$Y_i = \beta_0 + \beta_1 X_i + e_1 \quad (3.17)$$

Assumed the variance of residual has a function as follows:

$$\sigma_i^2 = f\,(\alpha_0 + \alpha_1 Z_{1i}) \quad (3.18)$$

σ_i^2 is a function of nonstochastic variable of Z. Then, it can be assumed that:

$$\sigma_i^2 = \alpha_0 + \alpha_1 Z_{1i} \quad (3.19)$$

σ_i^2 is the linear function of variable of Z. If $\alpha_1 = 0$, so $\sigma_i^2 = \alpha_0$ then the value is constant. Therefore, to test the σ_i^2 has homoschedastic so that the proposed null hypothesis is that $\alpha_1 = 0$. Steps of Breusch-Pagan method can be explained as follows:

1. Estimate the equation (3.17) with OLS and find the residual ($\hat{e}_i$)
2. Find $\sigma^2 = \frac{\sum \hat{e}_i^2}{n}$
3. Find p_i defined as:

$$p_i = \frac{\hat{e}_i^2}{\sigma^2} \quad (3.20)$$

4. Regression of p_i toward variable of Z as follows:

$$p_i = \alpha_0 + \alpha_1 Z_i + v_i \quad (3.21)$$

5. Get ESS (Explained Sum of Squares) from the equation (3.21) and then get:

$$\phi = 1/2(ESS) \quad (3.22)$$

If the residual in the equation (3.21) is distributed normally so $^1/_2$ (ESS) will follow the distribution of chi-square (x^2) as follows:

$$\phi = 1/2(ESS) \sim \chi^2_{df} \quad (3.23)$$

In general if there is Z variable has an equal value to m so ϕ will follow the distribution of χ^2 with degree of freedom (m-1). Therefore, if the value of ϕ statistics higher than χ^2 critical then there is heteroscedasticity. Otherwise, there is no heteroscedasticity.

The scenarios to decide whether H_0 is rejected or accepted are:

1. If chi-squares statistics > chi-squares critical in a certain significance level (α), therefore the model has heteroscedasticity problem.
2. If chi-squares statistics < chi-squares critical in a certain significance level (α), therefore the model has no heteroscedasticity problem.

3.4.3 Evaluation

3.4.3.1 Goodness of Fit

Goodness of fit criterion is some of several statistical tests that has been developed by econometricians to choose a good model where there are two –both –model have identical dependent variable, for example is by using coefficient of determination (R^2) or adjusted coefficient of determination ($\bar{R}^2$). The model which chosen is a model that has a value of R^2 or $\bar{R}^2$ which higher than the other models. The other criteria that can be used in choosing a model are Akaike's Information Criterion (AIC), Schwarz's Information Criterion (SIC) or Mallow's C_P Criterion (Widarjono, 2013).

3.4.3.2 F-Test and t-test

Widarjono (2013) explained that the t-statistic and F-statistic test are the tests to detect unimportant independent variable. T-statistic test is used to test the independent variables individually and F-statistic test is used to test the independent variables simultaneously. As a noteworthy, this significance test can be conducted only if the model has been established. However, it is still hesitating of the existing independent variables.

CHAPTER IV

DATA ANALYSIS AND DISCUSSION

4.1 Analysis of ECM model

This study uses ECM model to see the influence of variables FDI, GDP and export toward employment in long-term and short-term. Below is the long-term estimation model of employment in form of linear equation, which is used in this study:

$$lnN_t = \alpha_0 + \alpha_1 lnN_t + \beta_1 lnFDI_t + \beta_2 lnGDP_t + \beta_3 lnExp_t + \varepsilon_t$$

While the short-term estimation model of employment by using ECM Eangle-Granger approach is, as follows:

$$\Delta lnN_t = \alpha_0 + \alpha_1 \Delta lnN_t + \beta_1 \Delta lnFDI_t + \beta_2 \Delta\, lnGDP_t + \beta_3 \Delta Exp_t + ECT_t + \varepsilon_t$$

Next discussion will have discussed the analysis and result of ECM using Eviews.

4.1.1 Stationarity Test

First of all, unit root test is conducted in order to see the degree of integration of the data which is going to be used in this study. This study uses the unit root test developed by Dickey-Fuller. In the unit root test and degree of integration, if the value of t-statistic is higher than the value that is showed by the critical value therefore H_0 is rejected, meaning that the data observed are assumed that has been stationary. Meanwhile, if the value of t-statistic is lower than the value that is showed by the critical value therefore H_0 is accepted, meaning that the data

observed are non-stationary and need to conduct the unit root test because the data are differentiated.

Table 4. 1

Summary of Unit Root Test Results with Significance Level of 5%

ADF statistic	t-statistic at Level of Data	t-statistic at First Difference	Critical Value ($\alpha = 5\%$) at Level of Data	Critical Value ($\alpha = 5\%$) at First Difference
N	0.123830	-7.531820	-2.957110	-2.960411
FDI	-1.329494	-6.004158	-2.957110	-2.960411
GDP	3.747573	-2.963662	-2.957110	-2.960411
Export	-0.349448	-4.078668	-2.957110	-2.998064

Source: Estimation Result of EViews

Based on the result of the unit root test developed by Dickey-Fuller, it can be seen that all variables are non-stationary at level of data. Therefore the unit root test was continued to the first difference, the result of the unit root test at first difference level showed that all variables are significant at 5%.

4.1.2 Cointegration Test

Cointegration test is conducted in order to see an indication of the possibility of long-term relationships between variables of economy which are used in this study. If the variable indicates cointegration in the same level, it has long-term relationships, otherwise it has no long-term relationships.

Cointegration between variables can be seen by comparing between the value of trace statistic and the critical value. If the value of trace statistic is higher than the critical value, at a certain significance level, therefore between variables have cointegration. Meanwhile, if the value of trace statistic is lower than the

critical value, at a certain significance level, therefore between variables have no cointegration.

Table 4. 2

Result of Cointegration Test of Variable Employment

Sample (adjusted): 1990 2017
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: LNEXPORT LNN LNGDP LNFDI
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.869300	109.1948	47.85613	0.0000
At most 1 *	0.755904	52.21899	29.79707	0.0000
At most 2	0.351747	12.73354	15.49471	0.1250
At most 3	0.021070	0.596268	3.841466	0.4400

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 *	0.869300	56.97579	27.58434	0.0000
At most 1 *	0.755904	39.48545	21.13162	0.0001
At most 2	0.351747	12.13727	14.26460	0.1056
At most 3	0.021070	0.596268	3.841466	0.4400

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

Source: Estimation Result of EViews

The result of cointegration test showed, either the value of trace statistic or Max-eigenvalue, that the variable has cointegration. Therefore, it can be inferred from the result that the data has long-term relationships.

4.2 Long-term Analysis

4.2.1 Classical Assumption of Long-term Analysis

4.2.1.1 Auto-correlation Test

Table 4. 3

LM test result of Long-term analysis

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.470392	Prob. F(2,27)	0.0456
Obs*R-squared	6.748397	Prob. Chi-Square(2)	0.0342

Source: Estimation Result of EViews

According to the result of auto-correlation test using LM-Test it has obtained that the value of X^2 statistic is 6.748397, while the value X^2 critical with df = 2 at $\alpha = 5\%$ is 5.99. Thus, this represents X^2 statistic > X^2 critical, therefore H_0 is rejected, which means that the model has auto-correlation problem. In other way, it can be known from the probability of Chi-squares where 0.0342 < 0,05 therefore H_0 is rejected, meaning that the model has auto-correlation problem. Thus, Newey-West covariance method will be used to overcome the problem of auto-correlation.

4.2.1.2 Heteroscedasticity Test

Table 4. 4

Heteroscedasticity Test Result of Long-Term Analysis

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.398043	Prob. F(3,29)	0.0883
Obs*R-squared	6.559248	Prob. Chi-Square(3)	0.0874
Scaled explained SS	8.349664	Prob. Chi-Square(3)	0.0393

Source: Estimation Result of EViews

According to the result above, it has been obtained that the value of X^2 statistic is 6.559248, which the value of X^2 statistic was obtained from the

information of Obs*R-squared where the total of observation times coefficient of determination. While the value of X^2 critical with df = 3 and α = 5% is 7.81. Thus, X^2 statistic < X^2 critical, therefore H_0 is accepted, meaning that the model has no heteroscedasticity problem. In other way, it can be known from the probability of Chi-squares where 0.0874 > α = 0,05 therefore H_0 is accepted, meaning the model has no heteroscedasticity problem.

4.2.2 Evaluation of Long-Term Analysis

This subchapter showed the estimation result of long-term analysis of employment using Least Square Method with HAC (Newey-West) covariance method in order to overcome the problem of auto-correlation within the model.

Table 4. 5

Result of Long-term Regression of Employment

Dependent Variable: LNN
Method: Least Squares
Date: 12/11/18 Time: 05:39
Sample: 1985 2017
Included observations: 33
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	53.94792	3.358458	16.06330	0.0000
LNFDI	-0.000609	0.000194	-3.132414	0.0039
LNGDP	5.41E-05	9.47E-06	5.711465	0.0000
LNEXPORT	0.000130	2.06E-05	6.304239	0.0000

R-squared	0.975375	Mean dependent var	91.08935
Adjusted R-squared	0.972827	S.D. dependent var	16.77854
S.E. of regression	2.765809	Akaike info criterion	4.985756
Sum squared resid	221.8413	Schwarz criterion	5.167151
Log likelihood	-78.26497	Hannan-Quinn criter.	5.046790
F-statistic	382.8811	Durbin-Watson stat	1.137104
Prob(F-statistic)	0.000000	Wald F-statistic	287.3893
Prob(Wald F-statistic)	0.000000		

Source: Estimation Result of EViews

The estimation result from the long-term regression of employment has shown the value of R-Squared (R^2) is 0.975375. It means that the variable LNN was explained by LNFDI, LNGDP and LNEXPORT by 97.5375%. Thus, the rest of 2.4625% was explained by the other variables.

From the results in Table 4.3 it can be inferred that the value of probability (F-statistic) is 0.000000, meaning that the value of probability is below the significance level at α = 1% and statistically significant. Thus, the result above showed that the variables –which are Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Export –are simultaneously have significant influences toward employment (N) in long-term.

LNFDI variable with the value of coefficient and t-statistic respectively are -0.000609 and 3.132414. The value of coefficient showed that every 1% addition in the variable of FDI or LNFDI, the variable of employment or LNN would decrease by 0.000609%. While, the value of t-critical with α = 1% and df = 29 is 2.462 (see t-Table). As a conclusion, because the value of t-statistic is higher than t-critical, H_0 is rejected. This means that Foreign Direct Investment (FDI) has a negative relationship and significant influence toward Employment (N) in the long-term.

LNGDP variable with the value of coefficient and t-statistic respectively are 0.000054 and 5.711465. The value of coefficient showed that every 1% addition in the variable of GDP or LNGDP, the variable of employment or LNN would increase by 0.000054%. While, the value of t-critical with α = 1% and df = 29 is 2.462 (see t-Table). As a conclusion, because the value of t-statistic is higher than t-critical,

H_0 is rejected. This means that Gross Domestic Product (GDP) has a positive relationship and significant influence toward Employment (N) in the long-term.

LNEXPORT variable with the value of coefficient and t-statistic respectively are 0.000130 and 6.304239. The value of coefficient showed that every 1% addition in the variable of export or LNEXPORT, the variable of employment or LNN would increase by 0.000130%. While, the value of t-critical with $\alpha = 1\%$ and df = 29 is 2.462 (see t-Table). As a conclusion, because the value of t-statistic is higher than t-critical, H_0 is rejected. This means that export has a positive relationship and significant influence toward Employment (N) in the long-term.

4.3 Short-term Analysis

4.3.1 Classical Assumption of Short-term Analysis

4.3.1.1 Auto-correlation Test

Table 4. 6

LM Test Result of Short-Term Analysis

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.868632	Prob. F(2,25)	0.0164
Obs*R-squared	8.969976	Prob. Chi-Square(2)	0.0113

Source: Estimation Result of EViews

According to the result of auto-correlation test using LM-Test, it has been obtained that the value of X^2 statistic is 8.969976, while the value of X^2 critical with df = 2 at $\alpha = 5\%$ is 5.99. This represents X^2 statistic > X^2 critical, therefore H_0 is rejected, which means that the model has auto-correlation problem. In other way, it can be known from the probability of Chi-squares where is $0.0113 < \alpha = 0{,}05$ therefore H_0 is rejected, meaning that the model has auto-correlation problem. Thus,

Newey-West covariance method will be used to overcome the problem of auto-correlation.

4.3.1.2 Heteroscedasticity Test

Table 4. 7

Heteroscedasticity test result of Short-term analysis

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.674165	Prob. F(4,27)	0.1850
Obs*R-squared	6.359477	Prob. Chi-Square(4)	0.1739
Scaled explained SS	5.211784	Prob. Chi-Square(4)	0.2662

Source: Estimation Result of EViews

According to the result above, it has been obtained the value of X^2 statistic is 6.359477, which the value of X^2 statistic was obtained from the information of Obs*R-squared where the total of observation times coefficient of determination. While the value of X^2 critical with df = 4 and $\alpha = 5\%$ is 9.49. Thus, X^2 statistic < X^2 critical, therefore H_0 is accepted, this means that the model has no heteroscedasticity problem. In other way, it can be known from the probability of Chi-squares where $0.1739 > \alpha = 0{,}05$, therefore H_0 is accepted, this means that the model has no heteroscedasticity problem.

4.3.2 Evaluation of Short-term Analysis

This subchapter showed the estimation result of short-term analysis of employment using Error Correction Model (ECM) with HAC (Newey-West) covariance method in order to overcome the problem of auto-correlation within the model.

Table 4. 8

Result of Short-term Regression of Employment

Dependent Variable: D(LNN)
Method: Least Squares
Date: 12/11/18 Time: 05:41
Sample (adjusted): 1986 2017
Included observations: 32 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.678284	0.267276	6.279224	0.0000
D(LNFDI)	-0.000102	3.22E-05	-3.153986	0.0039
D(LNGDP)	5.45E-06	7.06E-06	0.772123	0.4467
D(LNEXPORT)	1.68E-05	2.04E-05	0.823120	0.4177
ECT01(-1)	-0.326760	0.077626	-4.209429	0.0003

R-squared	0.395197	Mean dependent var	1.830169
Adjusted R-squared	0.305596	S.D. dependent var	1.268196
S.E. of regression	1.056799	Akaike info criterion	3.090967
Sum squared resid	30.15426	Schwarz criterion	3.319989
Log likelihood	-44.45548	Hannan-Quinn criter.	3.166881
F-statistic	4.410654	Durbin-Watson stat	2.625434
Prob(F-statistic)	0.007138	Wald F-statistic	7.092563
Prob(Wald F-statistic)	0.000487		

Source: Estimation Result of EViews

The estimation result from the short-term regression of employment (Table 4.6) has shown the value of R-Squared (R^2) is 0.395197. It means that the variable D(LNN) was explained by D(LNFDI), D(LNGDP) and D(LNEXPORT) by 39.5197%. Thus, the rest of 60.4803% was explained by the other else variables.

The probability value of F-statistic is 0.007138. It indicated that the variables are significant at 1% of significance level. This result showed that the variables –which are Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Export – simultaneously have significant influences toward employment (N) in the short-term.

D(LNFDI) variable with the value of coefficient and t-statistic respectively are -0.000102 and 3.153986. The value of coefficient showed that every 1% addition in the variable of FDI or D(LNFDI), the variable of employment or LNN would decrease by 0.000102%. While, the value of t-critical with $\alpha = 1\%$ and df = 28 is 2.467 (see t-Table). As a conclusion, because the value of t-statistic is higher than t-critical therefore H_0 is rejected. This means that Foreign Direct Investment (FDI) has a negative relationship and significant influence toward Employment (N) in the short-term.

D(LNGDP) variable with the value of coefficient and t-statistic respectively are 0.000005 and 0.772123. The value of coefficient showed that every 1% addition in the variable of GDP or D(LNGDP), the variable of employment or LNN would decrease by 0.000005%. While, the value of t-critical with $\alpha = 1\%$ and df = 28 is 2.467 (see t-Table). As a conclusion, because the value of t-statistic is lower than t-critical therefore H_0 is accepted. This means that Gross Domestic Product (GDP) has a positive relationship and insignificant influence toward Employment (N) in the short-term.

D(LNEXPORT) variable with the value of coefficient and t-statistic respectively are 0.000016 and 0.823120. The value of coefficient showed that every 1% addition in the variable of export or D(LNEXPORT), the variable of employment or LNN would decrease by 0.000016%. While, the value of t-critical with $\alpha = 1\%$ and df = 28 is 2.467 (see t-Table). As a conclusion, because the value of t-statistic is lower than t-critical therefore H_0 is accepted. This means that export

has a positive relationship and insignificant influence toward Employment (N) in the short-term.

According to the Table 4.6 above, it can be known that the coefficient of ECT (N) is -0.326760. The value of coefficient showed that every 1% addition in the variable of ECT01, the variable of employment or LNN would decrease by 0.32676%. While, the value of probability is 0.0003, meaning that the variable is significant at 1% of significance level. Thus, the use of Error Correction Model in this study has been correct and can be assumed as valid.

4.4 Interpretation of Economic Analysis

Foreign Direct Investment (FDI) variable has the same result as influences between in short-term and long-term analysis. Both, in short-term and long-term regression, it showed that FDI has a significant influence and negative relationship toward employment. The negative relationship between FDI and employment was explained by Todaro & Smith (2000) because investment was an accumulation of capital that makes affordable to replace the technology by machine, which it could stimulate the rise of unemployment. Baokye-Gyasi & Li (2015) also had been emphasizing in their study that the increase in infrastructure sector through Chinese FDI flows had a negative significancy on employment growth, which means rapid infrastructure development cannot be translated into the absorption of employment. This phenomenon of empowering infrastructure sectors through FDI flow was similar to what happened in Indonesia recently, where during 2016/2017 the total number of employment was 121,022,423 people with the increase about less than 3 million people from the previous period and FDI flows was more than US$ 22

Billion. Therefore, this circumstances did not show the efficiency of FDI realization toward employment if it is compared with the previous period during 2015/2016. There was an increasing number of employment about more than 3.6 million people with the total number of employment in the end of 2016 which was 118.411.973 people. While in the same period there was disinvestment of FDI about US$ 15.2 Billion. This showed that in 2016 showed the higher rate in terms of absorption of employment than in 2017. Nevertheless, in 2017 has the higher number of FDI flows than the previous year.

Gross Domestic Product (GDP) variable showed a mixed result between the short-term and long-term,. However, both show positive relationships. In short-term, the variable of GDP shows an insignificant influences and positive relationship. While in the long-term, it shows a significant influence and positive relationship. The result of relationship between GDP and employment was in accordance with the study conducted by Malec, et al (2016). They showed that there is an indication of a strong positive relationship between employment and GDP development in Egypt. Therefore, it can be said that GDP growth will increase the employment.

Variable of Export also shows a mixed result between short-term and long-term,. Nevertheless both have positive relationships. In the short-term, the variable shows an insignificant influence and positive relationship. While in the long-term, it shows a significant influence and positive relationship. As suggested by Dizaji & Badri (2014), most of the suggestions has a chain effect or indirect effect of policies regarding to export toward employment. In other words, the policies will have been

taking some time before it could stimulate the employment sectors through export. Thus, this explained the significanct result of influences in the long-term analysis of export towards employment.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study aimed to examine the influence of FDI, GDP and export to the employment in Indonesia during period 1985 to 2017. The findings from the research are as follows:

1. Simultaneously Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Export as variables have influences toward Employment, either in the long-term or short-term. However, individually Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Export as variables have mixed results and different influences toward Employment.
2. Foreign Direct Investment (FDI) in both, long-term and short-term, has significant influences and negative relationships toward Employment.
3. Gross Domestic Product (GDP) has significant influences toward Employment in long-term. While in the short-term, GDP has insignificant influences toward Employment. However, GDP has a positive relationship toward employment either in the long-term or short-term.
4. Export has significant influences toward Employment in the long-term. While in the short-term, Export has an insignificant influences toward Employment. However, Export has a positive relationship toward Employment either in long-term or short-term.

According to the findings, it showed that FDI negatively influences the employment in Indonesia, which can be related to the basic characteristics of Indonesia as a developing country with high population that makes Indonesia as a labour abundant country with low-skilled labours. While the characteristics of home countries of the FDI came from countries with basic characteristics of developed countries with a capital abundant with high technology country and high-skilled labours, so that it commonly found that the majority of FDI inflows in Indonesia needs high-skilled labours into the its FDI realization. Thus, this study assumed that FDI inflows was less encouraging the employment in Indonesia because of the unmatches between type of FDI and the host-country. In other case of a negative relationship of FDI and employment, the realization of FDI into rapid infrastructure development which as a result of Jokowi's era could not be translated into the absorption of employment well because it tends to be one time project. In other words once the infrastructure was built therefore the employees would back to be unemployed.

However, some unemployment became the trade-off to prevent the increase of money wages. A pressure on money wages, increasing inequality of income and rising unemployment are frequently associated by the preservation of a stable value of money. In long-term, the reduced effective demand and declining output and employment levels are associated with the inclining inequality of income. This tendency is enchanced through the reductions in government expenditures as a cost to attract the FDI. In the other hand, there is a problem that would arise even if the output produced by FDI is exported. This means that the output emerging from FDI

exported and higher than average wages paid largely isolating those FDI sectors from the rest of the economy. Eventually this will lead to the second issue that FDI may bring about an increased dependence from the outside world, where raise the import coefficient for necessary goods, indispensable in the social process of production and may also lead to an increase of western type consumption goods. This immediately follows that higher import coefficient leads to lower employment levels (Akrami, 2008).

The other variables which had been examined in this study are GDP and export. GDP and export have a significant influence and positive relationship toward the employment in long-term through either direct effect and indirect chain effect. There are two scenarios of assumption assumed by the researcher: (1) increase output of the production would tend to encourage the demand of employees in order to rise their production, (2) increase output of the production would be followed by the downstream industries that would increase the production and tend to encourage the demand of employee as well as in upstream industries.

5.2 Recommendations

The government has been doing well by attracting investors to rise FDI inflows of Indonesia. Nevertheless, the number of investment alone would not yield anything good if it could not lift the social welfare in Indonesia itself. Therefore, massive sources have to be supported by right policies for the purpose of rising the Indonesian social welfare, which one of them is through the employment. Thus, the researcher proposes several recommendations that might become considerations to improve the efficiency of FDI to encourage the employment in Indonesia.

The government might consider to allocate the realization of FDI inflows into the business associated with the basic characteristics of labour abundant countries and manual workers by limiting the technology and utilizing the FDI to open vacancies because one of the reasons for the rising of unemployment is the accumulation of capital from investment replacing the manual labour with technology. The government also needs to prepare skill shifts of labour force, that might be achieved by facilitating low-skilled labours to become high-skilled labours. The improvement of human capital through education might be altered by a policy from the government to obligate the foreign company to limit the foreign workers and give trainings to domestic workers. Moreover, the government needs to prepare the manual labour or informal labour from infrastructure development sectors to shift skill into another sector of industries.

The changing of low-skilled labours to become high-skilled labours hopefully can be in line with the decrease of unemployment and compete with the high-technology that can replace the human labour as well as the improvement of informal employment in the urban and rural area. Thus, FDI can be utilized as an instruments to encourage the employment and give positive impacts to the employment in Indonesia.

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APPENDICES

Appendix 1

Data of the Research

Years	N	FDI	GDP	EXPORT
1985	62,46	310,00	228.786,57	18.586,7
1986	65,38	258,00	242.227,89	14.805,0
1987	67,58	385,00	254.159,86	17.135,6
1988	69,52	576,00	268.851,56	19.218,5
1989	70,43	682,00	288.898,71	22.158,9
1990	73,10	1.093,00	309.821,14	25.675,3
1991	73,91	1.482,00	331.235,92	29.142,4
1992	75,89	1.777,00	352.758,00	33.967,0
1993	76,72	2.004,00	375.674,60	36.823,0
1994	79,69	2.109,00	404.000,35	40.053,4
1995	81,20	4.346,00	437.209,21	45.418,0
1996	83,55	6.194,00	471.391,05	49.814,8
1997	85,05	4.677,00	493.545,85	53.443,6
1998	87,29	-240,80	428.759,44	48.847,6
1999	88,82	-1.865,62	432.151,47	48.665,4
2000	89,84	-4.550,36	453.413,62	62.124,0
2001	90,81	-2.977,39	469.933,59	56.320,9
2002	91,65	145,09	491.078,14	57.158,8
2003	92,81	-596,92	514.553,48	61.058,2
2004	93,72	1.896,08	540.440,02	71.584,6
2005	93,96	8.336,26	571.204,95	85.660,0
2006	95,46	4.914,20	602.626,66	100.798,6
2007	99,93	6.928,48	640.863,46	114.100,9
2008	102,55	9.318,45	679.403,09	137.020,4
2009	104,87	4.877,37	710.851,78	116.510,0
2010	108,21	15.292,01	755.094,16	157.779,1
2011	107,42	20.564,94	801.681,84	203.496,6
2012	112,50	21.200,78	850.023,66	190.020,3
2013	112,76	23.281,74	897.261,72	182.551,8
2014	114,63	25.120,73	942.184,64	175.980,0
2015	114,82	19.779,13	988.128,60	150.366,3
2016	118,41	4.541,71	1.037.863,87	145.186,2
2017	121,02	22.078,22	1.090.459,49	168.828,0

Description:

N : Number of employment (million in persons)

FDI : Foreign Direct Investment (million US$)

GDP : Gross Domestic Product (million US$)

Export : Export (million US$)

Appendix 2

Results of Unit Root Test at Level of Data

A. LNN

Null Hypothesis: LNN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.123830	0.9627
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNN)
Method: Least Squares
Date: 02/08/19 Time: 06:21
Sample (adjusted): 1986 2017
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNN(-1)	0.001775	0.014334	0.123830	0.9023
C	1.670148	1.312192	1.272792	0.2129

R-squared	0.000511	Mean dependent var	1.830169
Adjusted R-squared	-0.032805	S.D. dependent var	1.268196
S.E. of regression	1.288830	Akaike info criterion	3.405808
Sum squared resid	49.83250	Schwarz criterion	3.497417
Log likelihood	-52.49294	Hannan-Quinn criter.	3.436174
F-statistic	0.015334	Durbin-Watson stat	2.594918
Prob(F-statistic)	0.902275		

B. LNFDI

Null Hypothesis: LNFDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.329494	0.6036
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNFDI)
Method: Least Squares
Date: 02/08/19 Time: 06:22
Sample (adjusted): 1986 2017
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFDI(-1)	-0.151709	0.114110	-1.329494	0.1937
C	1542.432	1118.733	1.378731	0.1782

R-squared	0.055640	Mean dependent var	680.2567
Adjusted R-squared	0.024162	S.D. dependent var	5220.232
S.E. of regression	5156.782	Akaike info criterion	19.99447
Sum squared resid	7.98E+08	Schwarz criterion	20.08608
Log likelihood	-317.9116	Hannan-Quinn criter.	20.02484
F-statistic	1.767553	Durbin-Watson stat	1.955690
Prob(F-statistic)	0.193707		

C. LNGDP

Null Hypothesis: LNGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.747573	1.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGDP)
Method: Least Squares
Date: 02/08/19 Time: 06:23
Sample (adjusted): 1986 2017
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP(-1)	0.051494	0.013741	3.747573	0.0008
C	-857.1086	8043.925	-0.106554	0.9159

R-squared	0.318868	Mean dependent var	26927.28
Adjusted R-squared	0.296163	S.D. dependent var	21041.14
S.E. of regression	17652.46	Akaike info criterion	22.45560
Sum squared resid	9.35E+09	Schwarz criterion	22.54721

Log likelihood	-357.2896	Hannan-Quinn criter.	22.48597
F-statistic	14.04430	Durbin-Watson stat	1.474025
Prob(F-statistic)	0.000760		

D. LNEXPORT

Null Hypothesis: LNEXPORT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.349448	0.9062
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNEXPORT)
Method: Least Squares
Date: 02/08/19 Time: 06:24
Sample (adjusted): 1986 2017
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNEXPORT(-1)	-0.016043	0.045910	-0.349448	0.7292
C	5984.236	4532.561	1.320277	0.1967

R-squared	0.004054	Mean dependent var	4695.041
Adjusted R-squared	-0.029144	S.D. dependent var	14683.11
S.E. of regression	14895.53	Akaike info criterion	22.11597
Sum squared resid	6.66E+09	Schwarz criterion	22.20758
Log likelihood	-351.8556	Hannan-Quinn criter.	22.14634
F-statistic	0.122114	Durbin-Watson stat	1.742330
Prob(F-statistic)	0.729194		

Appendix 3

Results of Unit Root Test at First Difference

A. LNN

Null Hypothesis: D(LNN) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.531820	0.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNN,2)
Method: Least Squares
Date: 02/08/19 Time: 06:27
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNN(-1))	-1.317185	0.174883	-7.531820	0.0000
C	2.367306	0.384983	6.149118	0.0000

R-squared	0.661722	Mean dependent var	-0.010211
Adjusted R-squared	0.650057	S.D. dependent var	2.074249
S.E. of regression	1.227042	Akaike info criterion	3.309431
Sum squared resid	43.66333	Schwarz criterion	3.401946
Log likelihood	-49.29618	Hannan-Quinn criter.	3.339588
F-statistic	56.72831	Durbin-Watson stat	1.854229
Prob(F-statistic)	0.000000		

B. LNFDI

Null Hypothesis: D(LNFDI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.004158	0.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNFDI,2)
Method: Least Squares
Date: 02/08/19 Time: 06:28
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNFDI(-1))	-1.329630	0.221452	-6.004158	0.0000
C	748.8747	934.5205	0.801346	0.4294

R-squared	0.554189	Mean dependent var	567.3710
Adjusted R-squared	0.538816	S.D. dependent var	7657.819
S.E. of regression	5200.467	Akaike info criterion	20.01323
Sum squared resid	7.84E+08	Schwarz criterion	20.10574
Log likelihood	-308.2050	Hannan-Quinn criter.	20.04338
F-statistic	36.04992	Durbin-Watson stat	1.921426
Prob(F-statistic)	0.000002		

C. LNGDP

Null Hypothesis: D(LNGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.963662	0.0497
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGDP,2)
Method: Least Squares
Date: 02/08/19 Time: 06:29
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	-0.483093	0.163006	-2.963662	0.0060
C	13871.43	5411.103	2.563512	0.0158

R-squared	0.232465	Mean dependent var	1263.042
Adjusted R-squared	0.205998	S.D. dependent var	20893.22
S.E. of regression	18617.28	Akaike info criterion	22.56391
Sum squared resid	1.01E+10	Schwarz criterion	22.65642
Log likelihood	-347.7406	Hannan-Quinn criter.	22.59407

F-statistic	8.783291	Durbin-Watson stat	2.040944
Prob(F-statistic)	0.006020		

D. LNEXPORT

Null Hypothesis: D(LNEXPORT) has a unit root
Exogenous: Constant
Lag Length: 8 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.078668	0.0048
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNEXPORT,2)
Method: Least Squares
Date: 02/08/19 Time: 06:30
Sample (adjusted): 1995 2017
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEXPORT(-1))	-2.921641	0.716322	-4.078668	0.0013
D(LNEXPORT(-1),2)	1.926985	0.656436	2.935526	0.0116
D(LNEXPORT(-2),2)	1.508531	0.625308	2.412460	0.0313
D(LNEXPORT(-3),2)	1.802514	0.621788	2.898922	0.0124
D(LNEXPORT(-4),2)	1.797282	0.681878	2.635782	0.0206
D(LNEXPORT(-5),2)	2.129113	0.761633	2.795458	0.0152
D(LNEXPORT(-6),2)	2.726641	0.822112	3.316630	0.0056
D(LNEXPORT(-7),2)	3.018047	0.742564	4.064362	0.0013
D(LNEXPORT(-8),2)	2.324344	0.563323	4.126132	0.0012
C	11895.33	4830.160	2.462721	0.0285

R-squared	0.822261	Mean dependent var	887.4522
Adjusted R-squared	0.699212	S.D. dependent var	23074.43
S.E. of regression	12654.98	Akaike info criterion	22.02851
Sum squared resid	2.08E+09	Schwarz criterion	22.52220
Log likelihood	-243.3279	Hannan-Quinn criter.	22.15267
F-statistic	6.682349	Durbin-Watson stat	1.974613
Prob(F-statistic)	0.001237		

Appendix 4

Result of Cointegration Test

Date: 02/08/19 Time: 06:32

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Trend assumption: Linear deterministic trend

Series: LNEXPORT LNFDI LNGDP LNN

Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.869300	109.1948	47.85613	0.0000
At most 1 *	0.755904	52.21899	29.79707	0.0000
At most 2	0.351747	12.73354	15.49471	0.1250
At most 3	0.021070	0.596268	3.841466	0.4400

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 *	0.869300	56.97579	27.58434	0.0000
At most 1 *	0.755904	39.48545	21.13162	0.0001
At most 2	0.351747	12.13727	14.26460	0.1056
At most 3	0.021070	0.596268	3.841466	0.4400

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):

LNEXPORT	LNFDI	LNGDP	LNN
-6.39E-05	-0.000950	9.59E-05	-0.828867
-0.000297	0.002508	-0.000242	3.241568
0.000142	-0.001455	6.34E-05	-0.791766
-7.23E-06	-0.001713	0.000273	-2.779213

Unrestricted Adjustment Coefficients (alpha):

D(LNEXPORT)	5094.311	86.45494	2398.591	-653.9996
D(LNFDI)	551.0104	-1942.197	582.9256	22.33245
D(LNGDP)	-6289.598	-6997.883	3654.385	-1630.514
D(LNN)	0.289644	-0.013019	-0.170575	-0.059702

1 Cointegrating Equation(s): Log likelihood -849.1260

Normalized cointegrating coefficients (standard error in parentheses)

LNEXPORT	LNFDI	LNGDP	LNN
1.000000	14.88221	-1.502191	12978.09
	(4.45664)	(0.60561)	(6256.45)

Adjustment coefficients (standard error in parentheses)

D(LNEXPORT)	-0.325357
	(0.12864)
D(LNFDI)	-0.035191
	(0.04958)
D(LNGDP)	0.401695
	(0.30952)
D(LNN)	-1.85E-05
	(1.0E-05)

2 Cointegrating Equation(s): Log likelihood -829.3833

Normalized cointegrating coefficients (standard error in parentheses)

LNEXPORT	LNFDI	LNGDP	LNN
1.000000	0.000000	-0.023075	-2265.203
		(0.08325)	(975.937)
0.000000	1.000000	-0.099388	1024.263
		(0.00904)	(105.921)

Adjustment coefficients (standard error in parentheses)

D(LNEXPORT)	-0.351031	-4.625191	
	(0.61175)	(5.40161)	
D(LNFDI)	0.541575	-5.394805	
	(0.14419)	(1.27320)	
D(LNGDP)	2.479828	-11.57277	
	(1.30970)	(11.5643)	
D(LNN)	-1.46E-05	-0.000308	
	(4.9E-05)	(0.00044)	

3 Cointegrating Equation(s):	Log likelihood	-823.3147

Normalized cointegrating coefficients (standard error in parentheses)

LNEXPORT	LNFDI	LNGDP	LNN
1.000000	0.000000	0.000000	-2567.220
			(105.519)
0.000000	1.000000	0.000000	-276.5905
			(72.3504)
0.000000	0.000000	1.000000	-13088.61
			(731.572)

Adjustment coefficients (standard error in parentheses)

D(LNEXPORT)	-0.010437	-8.115798	0.619846
	(0.62557)	(5.69299)	(0.50057)
D(LNFDI)	0.624349	-6.243121	0.560638
	(0.14668)	(1.33487)	(0.11737)
D(LNGDP)	2.998742	-16.89090	1.324642
	(1.39284)	(12.6755)	(1.11453)
D(LNN)	-3.89E-05	-5.97E-05	2.01E-05
	(5.1E-05)	(0.00047)	(4.1E-05)

Appendix 5

Classical Assumption Test of Long-Term Regression

A. Auto-correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.470392	Prob. F(2,27)	0.0456
Obs*R-squared	6.748397	Prob. Chi-Square(2)	0.0342

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/19 Time: 06:39
Sample: 1985 2017
Included observations: 33
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.223881	1.652005	0.740846	0.4652
LNFDI	0.000212	0.000141	1.500609	0.1451
LNGDP	-6.41E-07	5.43E-06	-0.118115	0.9069
LNEXPORT	-2.74E-05	2.86E-05	-0.956084	0.3475
RESID(-1)	0.368782	0.196397	1.877739	0.0713
RESID(-2)	0.358498	0.262162	1.367464	0.1828

R-squared	0.204497	Mean dependent var	-6.35E-15
Adjusted R-squared	0.057181	S.D. dependent var	2.632972
S.E. of regression	2.556585	Akaike info criterion	4.878188
Sum squared resid	176.4754	Schwarz criterion	5.150280
Log likelihood	-74.49009	Hannan-Quinn criter.	4.969738
F-statistic	1.388157	Durbin-Watson stat	1.536368
Prob(F-statistic)	0.259988		

B. Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.398043	Prob. F(3,29)	0.0883
Obs*R-squared	6.559248	Prob. Chi-Square(3)	0.0874
Scaled explained SS	8.349664	Prob. Chi-Square(3)	0.0393

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/08/19 Time: 06:41
Sample: 1985 2017

Included observations: 33
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.518078	12.99659	-0.501522	0.6198
LNFDI	-0.001136	0.000893	-1.272367	0.2134
LNGDP	3.31E-05	3.39E-05	0.978620	0.3359
LNEXPORT	2.20E-05	9.88E-05	0.223058	0.8251

R-squared	0.198765	Mean dependent var	6.722463
Adjusted R-squared	0.115879	S.D. dependent var	12.39507
S.E. of regression	11.65480	Akaike info criterion	7.862525
Sum squared resid	3939.195	Schwarz criterion	8.043920
Log likelihood	-125.7317	Hannan-Quinn criter.	7.923559
F-statistic	2.398043	Durbin-Watson stat	1.586453
Prob(F-statistic)	0.088346		

Appendix 6

Result of Long-Term Regression

Dependent Variable: LNN
Method: Least Squares
Date: 02/08/19 Time: 06:39
Sample: 1985 2017
Included observations: 33
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	53.94792	3.358458	16.06330	0.0000
LNFDI	-0.000609	0.000194	-3.132414	0.0039
LNGDP	5.41E-05	9.47E-06	5.711465	0.0000
LNEXPORT	0.000130	2.06E-05	6.304239	0.0000

R-squared	0.975375	Mean dependent var	91.08935
Adjusted R-squared	0.972827	S.D. dependent var	16.77854
S.E. of regression	2.765809	Akaike info criterion	4.985756
Sum squared resid	221.8413	Schwarz criterion	5.167151
Log likelihood	-78.26497	Hannan-Quinn criter.	5.046790
F-statistic	382.8811	Durbin-Watson stat	1.137104
Prob(F-statistic)	0.000000	Wald F-statistic	287.3893
Prob(Wald F-statistic)	0.000000		

Appendix 7

Classical Assumption of Short-Term Regression

A. Auto-correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.868632	Prob. F(2,25)	0.0164
Obs*R-squared	8.969976	Prob. Chi-Square(2)	0.0113

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/19 Time: 06:45
Sample: 1986 2017
Included observations: 32
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.042565	0.276438	-0.153977	0.8789
D(LNFDI)	2.16E-05	4.58E-05	0.471839	0.6411
D(LNGDP)	4.57E-07	8.26E-06	0.055253	0.9564
D(LNEXPORT)	3.13E-06	1.51E-05	0.206964	0.8377
ECT01(-1)	0.036505	0.078322	0.466089	0.6452
RESID(-1)	-0.272319	0.212363	-1.282326	0.2115
RESID(-2)	0.403384	0.185784	2.171254	0.0396

R-squared	0.280312	Mean dependent var	3.12E-16
Adjusted R-squared	0.107587	S.D. dependent var	0.986265
S.E. of regression	0.931701	Akaike info criterion	2.887030
Sum squared resid	21.70167	Schwarz criterion	3.207660
Log likelihood	-39.19248	Hannan-Quinn criter.	2.993310
F-statistic	1.622877	Durbin-Watson stat	2.032009
Prob(F-statistic)	0.182365		

B. Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.674165	Prob. F(4,27)	0.1850
Obs*R-squared	6.359477	Prob. Chi-Square(4)	0.1739
Scaled explained SS	5.211784	Prob. Chi-Square(4)	0.2662

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/08/19 Time: 06:46

Sample: 1986 2017
Included observations: 32
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.326054	0.317054	1.028387	0.3129
D(LNFDI)	-2.32E-05	4.12E-05	-0.562876	0.5782
D(LNGDP)	1.74E-05	1.49E-05	1.168001	0.2530
D(LNEXPORT)	3.48E-05	2.35E-05	1.482841	0.1497
ECT01(-1)	-0.087265	0.125527	-0.695193	0.4929

R-squared	0.198734	Mean dependent var	0.942321
Adjusted R-squared	0.080028	S.D. dependent var	1.452702
S.E. of regression	1.393362	Akaike info criterion	3.643917
Sum squared resid	52.41937	Schwarz criterion	3.872939
Log likelihood	-53.30268	Hannan-Quinn criter.	3.719831
F-statistic	1.674165	Durbin-Watson stat	1.584794
Prob(F-statistic)	0.185003		

Appendix 8

Result of Short-Term Regression

Dependent Variable: D(LNN)
Method: Least Squares
Date: 02/08/19 Time: 06:46
Sample (adjusted): 1986 2017
Included observations: 32 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.678284	0.267276	6.279224	0.0000
D(LNFDI)	-0.000102	3.22E-05	-3.153986	0.0039
D(LNGDP)	5.45E-06	7.06E-06	0.772123	0.4467
D(LNEXPORT)	1.68E-05	2.04E-05	0.823120	0.4177
ECT01(-1)	-0.326760	0.077626	-4.209429	0.0003

R-squared	0.395197	Mean dependent var	1.830169
Adjusted R-squared	0.305596	S.D. dependent var	1.268196
S.E. of regression	1.056799	Akaike info criterion	3.090967
Sum squared resid	30.15426	Schwarz criterion	3.319989
Log likelihood	-44.45548	Hannan-Quinn criter.	3.166881
F-statistic	4.410654	Durbin-Watson stat	2.625434
Prob(F-statistic)	0.007138	Wald F-statistic	7.092563
Prob(Wald F-statistic)	0.000487		