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RESEARCH ARTICLE

FOREIGN DIRECT INVESTMENT IN INDONESIA AND ITS ROLE TO ECONOMIC GROWTH (VECTOR AUTOREGRESSIVE MODEL APPROACH)

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ABSTRACT

This study aimed to analyze Foreign Direct Investment (FDI) and relationship with economic growth with the other problems: First, the influence of foreign investment in Indonesia to economic growth in the long term, second, how the relationship between Foreign Investment and economic growth in Indonesia, and third, how the response due to changes in foreign investment to economic growth. This study uses analysis of Vector Autoregressive Model (VAR). The results of this research note that cointegration (relationship) of foreign investment to economic growth in the long term, foreign investment has positive influence on economic growth, and changes in foreign investment fluctuated, to return to normal and improve growth economy takes 6 years.

INTRODUCTION

As a developing country Indonesia is aim activities of the foreign investment with huge potential. Foreign direct investment (FDI) can act as a means to transfer factors from developed countries to developing countries for FDI accelerate speed of "General Purpose Technology" (GPT) and introduce advanced technology and science that does not exist in developing countries(Yao, 2007). The process of economic recovery after various global financial crisis, the presence of PMA is urgently needed to develop potential sectors in order to spur economic growth. FDI for Indonesia serves as main element of industrial development and economic growth. In addition acting as capital inflows, foreign investment has a spillover effect form transfer of foreign technology, managerial capabilities, and improved international competitiveness for domestic companies. According Vernon and Caves inRifai (2008) the presence of multinational companies in host country more productive than domestic companies engaged in same field and have a positive impact on performance of domestic companies. Based on this understanding, international trade and foreign capital investment is considered as a source of knowledge and technology transfer, especially from industrialized countries to developing countries, including Indonesia.

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When local governments are expected to be self-sufficient in building area, in fact only less than a quarter of area that is economically capable of self because of natural wealth that happened to be in the region. The rest are still experiencing difficulties in meeting needs of capital and investment in order to carry out economic development in that region. Given that during foreign direct investment only geographically concentrated in Greater Jakarta and Surabaya. According to Lipsey (2004) PMA in Indonesia was instrumental in creating jobs for educated labor. The rapid economic growth of a country is main thing that taken into account by investors if capital given it will give you an advantage or not. The creation of a conducive investment climate would provide comfort to investors to entrust their money. Foreign investment can improve sluggish economic activity due to lack of capital for implementation of economic development. To know importance of PMA in Indonesia needed a scientific study that expected to be basis for policy making, so that debate is happening against PMA in the short term and in the long run no longer be a crucial issue. This study is important because until now still very much needed foreign investment in Indonesia. From above explanation, the authors are interested to analyzing and pour into written form entitled "Foreign Investment in Indonesia and Their Relation to Economic Growth". Foreign investment is one of tools used to promote economic growth as indirect foreign investment will declare an increase in output. Capital inflows to emerging markets such as Indonesia is a source of financing for development and

support the development and deepening of domestic financial markets. Development and economic growth in Indonesia will not be separated from role of foreign funding sources. This condition occurs because almost all developing countries can not meet the needs of domestic funds. Due to relatively limited national savings while investment needs for implementation of development costs a relatively very large, foreign investment is seen as one way out in solving the shortage of financing sources. The increasingly fierce competition world countries into three attract Foreign Direct Investment to encourage each country to further improve investment climate through a more comprehensive policy framework and in accordance with the demands of investors. This should be supported by economic determinant and non economic determinant that are more conducive. According Ralhan, (2006) a variety of empirical results indicate that macroeconomic fundamentals are quite important in attracting foreign capital flows in the country, thus implying that macroeconomic policies must be appropriate and should provide incentives to attract foreign investment. Identify problems that have been submitted can be formulated several problem as follows; (1) How to influence foreign investment in Indonesia to economic growth in the long term, (2) How is the relationship between Foreign Investment and economic growth in Indonesia, and (3) How is the response due to changes in foreign investment to economic growth?

Theoretical Framework

Krugman (2004) indicated that Foreign Direct Investment (FDI)is the international flow of capital from a country where company is set up or expand his company to another country. Therefore, not only transfer of resources, but also implementation of control over companies abroad. Foreign investment is an effort to raise capital for economic development that comes from abroad. According Hecksher Ohlin, traditional theories regarding foreign direct investment to treat foreign direct investment as a form of international capital movements. The big difference in relative content of labor (labor) and capital (capital) owned between countries lead to differences in rate of return (rate of return) of capital as stated in interest rates. This leads to movement of capital from rich countries to poor countries (Krugman, 2004). A country that has a value lower domestic savings should think harder to increase foreign investment in the country (Syamsudin, 2008). Foreign direct investment means that companies from countries investors directly supervise asset invested in capital importing country. Foreign direct investment can take several forms, namely: establishment of a branch in capital importing country; the establishment of a company in which investor companies of the state has a majority stake; the establishment of a company importing country is solely financed by companies located in country of investors; establish a corporation in the country of investor to specifically operate in other countries; or put assets (fixed assets) in another country by the national company of state investors (Jhingan, 2004).

One of the indicators used to assess performance economy of a country is economic growth. According Amir (2007) economic growth is one important indicator in assessing performance of an economy, especially to analyze results of economic development in country implemented. Economic growth illustrates the ability of an economy to produce goods and services context of economic development. Economic growth is the increase in national income. In the General Theory, Keynes stated that total income of economy, in the short run is determined by desire of households, companies and government to spend its earnings. The more people who expend their income, more goods and services that can be sold by the company. More companies sell, more output they will produce and more workers will be employed. High economic growth and sustainable processes are main condition for sustainability of economic development. To achieve economic growth was necessary sources of financing in order to encourage businesses, one through actual investments. High economic growth will affect investment, particularly foreign investment for economic growth to be one of macroeconomic indicators on which investor ratings. Foreign investment if managed properly then it will have a positive contribution. The rapid flow of capital is a good opportunity to obtain financing sustainable economic development. Foreign investment is one form of economic openness apart from international trade (Kappel, 2003). Openness in terms of foreign capital can accelerate economic growth due to entry of foreign investment can increase domestic production factors both on quantity and quality and then encourage economic growth. Economic growth requires provision and allocation of production factors efficiently. Greenaway (2002) suggests that there is a positive impact of foreign direct investment in developing countries, the economic growth in destination countries of investment are higher than ever before. Foreign direct investment has more advantages such as long-term nature, many contributed to transfer of technology, transfer of management skills, job opportunities create new jobs. This workforce this work is very important for developing countries such as Indonesia, given limited ability of government to provide jobs.

MATERIALS AND METHODS

Types and Sources of Data

The data used in this research is time series data from 2000 to 2014 year. Data required in this study are data Foreign Direct Investment (FDI) in Indonesia and countries of the ASEAN region, by Gross Domestic Product (GDP) of Indonesia and countries of the ASEAN region.

Methods of Analysis and Data Processing

The data in this study using EViews 7.0 program. In writing this study, the model used is the model VAR (Vector Autoregression). To qualify in the test, it first has to do some testing stages, namely:

Stationarity Test (Unit Root Test)

Testing unit root is often called a stationary stochastic process, because in principle testing is done to see if a certain coefficient of models otogresif estimated to have a value of one or not. In time series analysis, information on stationary of a data series is very important because it included non-stationary variables into equation regression coefficient estimates will result in standard error of resulting bias. In this study, stationary test conducted by using Augmented Dickey-Fuller Test (ADF). The stationary test null hypothesis is based on stochastic variable has a unit root. By using ADF model test, the null hypothesis and other decision-making basis used

in this test is based on the critical value MacKinnon instead of t-test. Furthermore, t ratio than critical value t table statistics on ADF to determine whether or not roots unit.If the hypothesis is accepted it's mean that variable is not stationary, it is necessary to test degree of integration. Test degree of integration is intended to look at degree or order diferensi to how the observed data will be stationary

Cointegration test

If there is a data on stationary at diferensi process data, then we must make cointegration test to determine whether data have a relationship in the long term or not. If there is cointegration, this model is called VECM models, but if there is no cointegration, this model is called the VAR model with data diferensi (VAR in difference). This method can be used to perform cointegration tests, such as Engle-Granger Cointegration Test, Johansen Cointegration Test and Cointegration Regression Durbin-Watson Test.

Causality Test (Granger Causality)

Granger causality conducted to determine effect of one variable with another variable and indicates direction of causality. Granger causality only examine the relationship between variables and estimates models. Mathematically, Granger causality equation for two variables can be written as follows:

$Y_t = \Sigma\, a_i Y_{t-i} + \Sigma\, b_j X_{t-j} + v_t$; X → Y if$bj > 0$
$X_t = \Sigma\, c_i Y_{t-i} + \Sigma\, d_j X_{t-j} + u_t$; Y → X if$dj > 0$

The formulation of a model of causality between capital expenditure and human development indices proposed in this study are:

$PE_t = \alpha\, PMA_{t-1} + \beta\, PE_{t-1}$ .....(1)

$PMA_t = \gamma\, PE_{t-1} + \delta\, PMA_{t-1}$ .....(2)

VAR Model

VAR models developed by Sim, assumes that all variables in simultaneous equations is an endogenous variable. This assumption is often applied for determination of exogenous variables in simultaneous equations is subjective. In VAR, all dependent variable in equation will also appear as independent variables in the same equation. VAR is a modeling approach every endogenous variable in system as a function of lag all endogenous variables in the system. Based on the standard form in VAR model, a common form of empirical models are as follows:

$$Y_t = \beta_0 + \beta_1 Y_{t-n} + \beta_2 X_{t-n} + e_t$$

Where :
- Y : Economic Growth (Variable Not Free)
- X : Foreign Direct Investment (Variables)
- β_0 : constants
- β_1, β_2 : regression coefficient
- e_t : Error element bully / standard error
- t : time period (2000, ..., 2014)
- t-n : previous period

$$PE_t = \beta_0 + \beta_1 PE_{t-n} + \beta_2 PMA_{t-n} + e_t \text{.....(4)}$$

$$PMA_t = \beta_0 + \beta_1 PMA + \beta_2 PE_{t-n} + e_t \text{.....(5)}$$

where :
- PE : Economic Growth (Million)
- PMA : Foreign investment (%)
- β_0 : constants
- β_1, β_2 : regression coefficient
- e_t : Error element bully / standard error
- t : time period (2000, ..., 2014)
- t-n : previous period

Analysis of Impulse Response Function (IRF) and Forecast Error Variance Decomposition of (FEDV)

According Juanda and Junaidi (2012),VAR model can be used to see impact of changes in one variable to another variable dynamically. The trick is to give a shock to one endogenous variable. A surprise given usually by one standard deviation of variable (called innovations). Search the influence of shock experienced by a variable value of all the variables at this point or at some future period a technique called Impulse Response Function (IRF). Basically IRF describe trajectory (path) where a variable will return to equilibrium after experiencing shock of other variables. FEDV aims to predict percentage contribution of each variable variance due to changes in certain variables in VAR system. FEDV analysis is used to illustrate relative importance of each variable in VAR system for their surprise. The results of variance decomposition shows strength of Granger Causality relationship that may exist between variables impact analysis. In other words, if a variable explains a large portion of forecast error variance other variables, it does indicate a strong relationship Granger Causality.

Operasional Variabel

In this study variables used include:

Foreign Direct Investment (FDI): Foreign Direct Investment (FDI) used in this study is value of FDI directly or referred by Foreign Direct Investment (FDI) is realized in Indonesia and other ASEAN countries in US Dollar.

Economic growth: Economic growth is referred in this study change in the percentage of Gross Domestic Product (GDP) of Indonesia. Economic growth data coming from BPS

RESULTS AND DISCUSSION

This study uses linear regression model Autoregression Vector (VAR). Here are results of processed data that has been carried out according to defined procedures:

Stationarity Test Result Data: Root Test Unit (Unit Root test)

Time series data said to not contain unit root or stationary if value of ADF test statistic is greater than critical value MacKinnon 1%, 5% and 10%. The test has performed using EViews 7.0 program with results illustrated by table that you have attached. Conclusions from unit root test has been done like. Table above shows that variables used in study are not entirely stationary at current level. Unstationary data is seen

from ADF t-value smaller than critical value MacKinnon on real level of 1%, 5% and 10% (attached). Therefore, testing roots of this unit needs to be continued at level of first difference is:

Table 1. Unit Root Test Results At Level

Variable	MacKinnon Critical Value		t-stat ADF	Prob.	Information
PE	1%	-2.740613	-0.223139	0.5878	not Stationary
	5%	-1.968430			
	10%	-1.604392			
PMA	1%	-2.740613	0.851045	0.8830	not Stationary
	5%	-1.968430			
	10%	-1.604392			

Source: Results of data processing by using EViews 7.0

Table 2. Unit Root Test Results In First Level Difference

Variable	MacKinnon Value	Critical	t-stat ADF	Prob.	Information
PE	1%	-2.754993	-5.666631	0.0000	Stationary
	5%	-1.970978			
	10%	-1.603693			
PMA	1%	-2.754993	-3.412142	0.0025	Stationary
	5%	-1.970978			
	10%	-1.603693			

Source: Results of data processing by using EViews 7.0

After testing on a second difference roots, then all data is stationary on critical value of either 1%, 5% and 10% (attached). It's means that data used in this study is integrated or stationary at second level difference as shown in above table.

Cointegration Test Results

From the results of stationary test is known that there is a stationary data on diferensi process data, then next step should be a test for cointegration. Based on results of cointegration tests that have been conducted using Eviews 7.0 Unknown:

Max-Eigen Statistic = 468.5675

Critical Value 5% = 14.26460

It can be concluded that based on value of Max-Eigen, Max-Eigen value test is greater than critical value at the level of α = 5%. Ie 468.5 <14.26. So it can be concluded that there is cointegration between variables and it can be concluded that there is a long-term relationship between economic growth and Foreign Direct Investment (Eviews data processed results can be seen in appendix).

Effect of Foreign Direct Investment on Economic Growth in Indonesia

Following the results of regression analysis of the VAR model that has been done using EViews 7.0 (regression results can be seen in terms of attachment)

Equation 1:

$PE_t = 1{,}0484 + 0{,}6177\ PE_{t-1} + 0{,}3248\ PE_{t-2} - 0{,}0001\ PMA_{t-1} + 0{,}000064\ PMA_{-2}$

F-stat = 0.78 2,42 1,26 -1,7 1,01
R^2 = 0,61

This means:

Variable regression coefficient PMAt-1 at 0.0001. It's means, if it assumed that during research methods first period of foreign investment increased by 1 million US $, the economic growth of this period will decrease by 0.0001%. PMAt-variable regression coefficient -0.000064. That is, if it is assumed that during research methods second period investment increased by 1 million US $, the economic growth of this period will increase by 0.000064%. R-Squared value of this is 0.61. Meaning: Variation changes (increase or decrease) of foreign investment prior periods affect human development index by 61%. And rest is influenced by other variables not included in this study.

Equation 2:

$PMA_t = -19533 + 3530{,}6\ PE_{t-1} + 713{,}28\ PE_{t-2} + 0{,}3090\ PMA_{t-1} + 0{,}6297\ PMA_{-2}$

t-stat = -2,3 2,2 0,44 0,88 1,59
R^2 = 0,86

Means:

Variable regression coefficient PEt-1 amounted to 3530.6. It's means, if it is assumed that during research methods first period of economic growth increased by 1%, the foreign investment this period will be increased by 3530.6 million US $. Variable regression coefficient PEt-2 at 713.28. It's means, if it is assumed that during research method of economic growth in second period increased by 1%, the foreign investment will increase this period amounted to 713.28 million US $. R-Squared value of his amounted to 0.86. Meaning: Variation changes (increase or decrease) previous period of economic growth affects foreign investment of 86%. And the rest is influenced by other variables not included in this study.

Causality relationship between economic growth and Foreign Direct Investment in Indonesia

Granger Causality test is used to look at causality (reciprocal) between variables studied were PE and PMA. The test is performed using EViews 7.0 program with the results illustrated by table that you have attached. The conclusion of test results causality test has been done is*:*

- PE does not Granger Cause PMA = 0.0767
- PMA does not Granger Cause PE = 0.2129

It concluded that:

- PE affects PMA, because the probability is smaller than the significant level of 10% → (0.07 <0.10).
- PMA does not affect PE, because the probability is greater than the significant level of 5% or 10%.

Based on Granger Causality test results showed a one-way causal relationship between HDI and Capital Expenditures during period 2000-2014. Pattern or direction of causality is from PE to PMA. The high economic growth will lead to increased FDI.

Due Response Analysis of Changes in Foreign Direct Investment to the Economic Growth in Indonesia

Impuls Response Function Analysis (IRF)

Impulse response analysis is done to see impact shock (shock) Growth on time horizon ahead. Here are the results of impulse response graph analysis that has been done by means of analysis EViews 7.0:

- In response graph of PE to PMA, explaining response PE for their shock or surprise at PMA variable. Changes in foreign investment have fluctuated in the first year up to 5th and then increased in 6th until 10th. So, it takes 6 years to return to normal and can boost economic growth. Increasing Economic Growth in year 6 to 10 on average have increased but are still below balance point negative impact on economic growth.

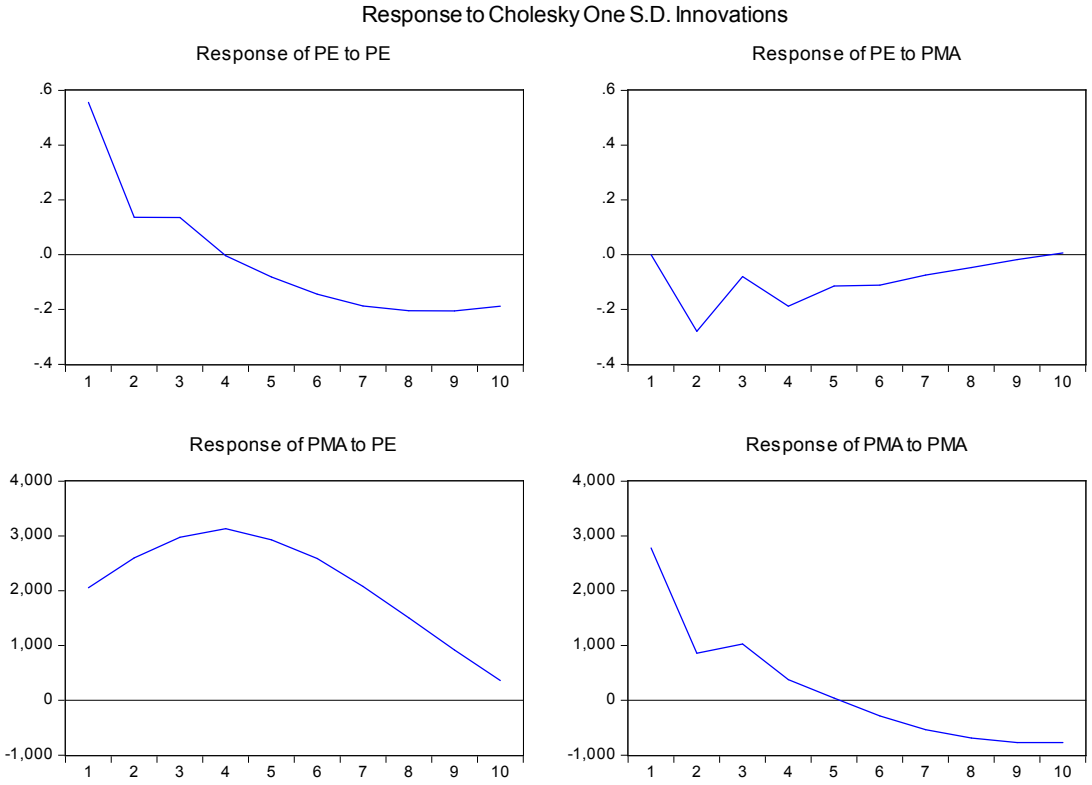

Figure 1. Graph Impuls Response (IRF)

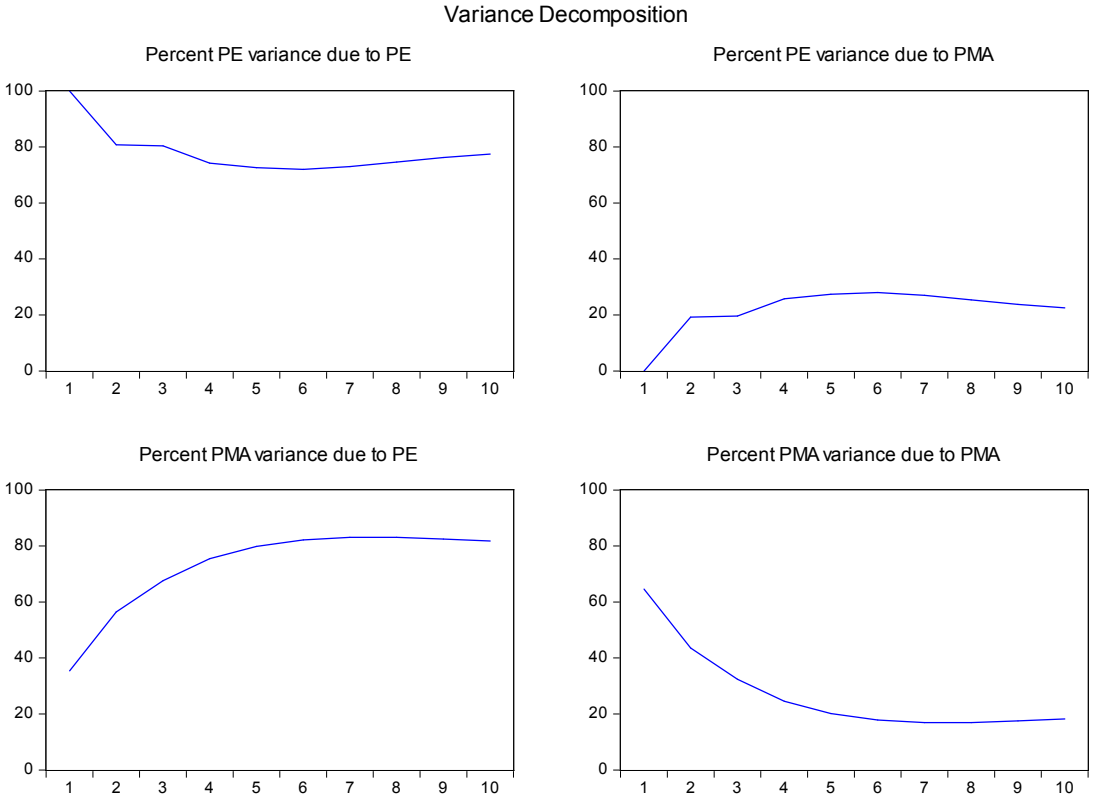

Figure 2. Graph Variance Decomposition (FEDV)

- In response graph of FDI to PE, describes response of FDI for their shock at variable PE. Their surprise at PE in first year led to a rise in FDI in first year until the fourth year. After the 4th year, shock that occurs in PE causes FDI has decreased to 10th year

Forecast Error Decomposition of Variance (FEDV)

Variance Decomposition useful for predictingpercentage contribution of each variable variance due to changes in certain variables in VAR system. FEDV analysis has used to illustrate the relative importance of each variable in VAR system for their shock. The results of variance decomposition shows strength of the Granger Causality relationship that may exist between variables impact analysis. Here are the results of analysis of variance decomposition chart that has been done by means of analysis EViews 7.0:

- In PE graph variance due to PMA, explaining contribution of FDI to economic growth. It can be seen that from beginning of period until end period contribution of FDI to economic growth is increasing.
- InPMA graph variance due to PE, explaining contribution of economic growth to PMA. It can be seen that from beginning of the period up to 10th year contribution Economic Growth always has increased greatly to PMA.

Table 4. Results Estimation Variance Decomposition (FEVD)

Variance Decomposition of PE:			
Period	S.E.	PE	PMA
1	0.555871	100.0000	0.000000
2	0.637017	80.74661	19.25339
3	0.656283	80.37307	19.62693
4	0.682788	74.25687	25.74313
5	0.697021	72.62278	27.37722
6	0.720445	71.97670	28.02330
7	0.748081	73.01988	26.98012
8	0.776954	74.62807	25.37193
9	0.803774	76.24130	23.75870
10	0.825567	77.47285	22.52715
Variance Decomposition of PMA:			
Period	S.E.	PE	PMA
1	3455.949	35.36350	64.63650
2	4407.862	56.47133	43.52867
3	5416.932	67.57457	32.42543
4	6269.279	75.43123	24.56877
5	6919.013	79.82520	20.17480
6	7392.605	82.17689	17.82311
7	7697.390	83.07291	16.92709
8	7873.804	83.05741	16.94259
9	7964.284	82.50795	17.49205
10	8009.572	81.78275	18.21725
Cholesky Ordering: PE PMA			

***Variance decomposition* of PE:** That table explained in first year, PE is strongly influenced by shock itself, while in period from the shock of FDI is still influential. Onwards, starting from year 1 to year 4, the proportion of shock or surprise PE to PE was decreased but numbers were small to contribute 74.25%. However, a larger proportion of PE shock effect gradually increased back to PE itself up to 10. Next year, shock FDI increasing contribution to 6th year.

Starting in year 6, capital expenditure shock even contribute more than 20% of PE. However, in year 7 to year 10, was in shock capital expenditures decreased little by little and give effect to the IPM to 22%.

***Variance decomposition* of PMA:** That table explained that in first year, FDI is greatly influenced by shock of FDI amounting to 64%, while PE contributed only 35%. Onwards, ranging from quarter 1 to quarter 4, the proportion of shock or surprise to PMA .PMA itself has always decreased volatile until end of that period, contributing 18%. However, a larger proportion of PE shock effect gradually increased to PMA until the end of period, despite a little decline in 9th and 10th but only a small decrease ie with acontribution of 81%.

Conclusion

After conducting an analysis and discussion results of the study as described in previous chapters, it can be concluded, first, that there is cointegration (relationship) growth foreign investment to economy in the long term. Second, foreign investment has positive influence on economic growth. Third, changes in foreign investment fluctuated,return to normal and improve the economic growth takes 6 years. Increasing Economic Growth in year 6 to 10 on average have increased but are still below balance point negative impact on economic growth.

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