UNIVERSITAS INDONESIA

THE IMPACT OF NON-OIL AND GAS EXPORT ON EMPLOYMENT CREATION IN INDONESIA

THESIS

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FACULTY OF ECONOMICS
MASTER OF PLANNING AND PUBLIC POLICY
JAKARTA
JANUARY 2010

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THESIS

A Thesis submitted in partial fulfillment of the requirements for the degree of Master of Economics in Planning and Public Policy Universitas Indonesia
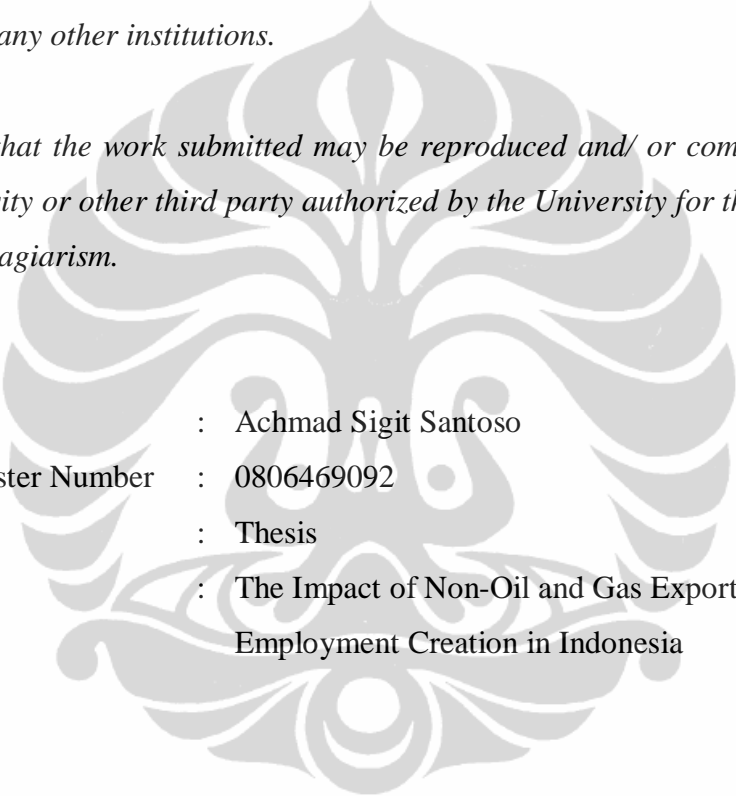

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ACKNOWLEDGEMENT

Thank to Allah aza wajalla, I prayed to God Almighty, for the blessings and His mercy, I can finish this thesis. Writing this thesis conducted in order to fulfill one of the requirements to achieve a degree Masters in Economics Department of Magister of Planning and Public Policy at the Faculty Economic University of Indonesia. I realize that, without the help and guidance from various parties, from the course until the preparation of this thesis, it is very difficult for me to complete the thesis. Therefore, I say thank you to:

(1) Mr. Dr. Ir. Widyono Soetjipto. MSc, my supervisor for his guidance, patience, recommendation and critic that made this study a valuable learning process for me;

(2) The Education and Training Centre of Ministry of Trade, Mr. Robby Kumenaung, Mr. Rahayu Budi, and Mr. Cipto who have been so helpful and supportive learning process that I do;

(3) My beloved parents who provide moral support and they prayers;

(4) Reni, my lovely wife and my lovely children Zaid, Hasna who has provided material assistance and moral support; and

(5) Catfish (Laily), the editor of my thesis although only chapter 1 and 2. Hanas, Andi, and others, who have helped me in completing this thesis.

Finally, I hope God Almighty repay all the good pleasure of all parties who have helped. Hopefully this thesis bring benefits to the development of science.

Depok, January 10, 2010

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ABSTRACT

Name   : Achmad Sigit Santoso

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High unemployment is a crucial problem for Indonesia. Various efforts have been made by the government in order to reduce the unemployment rate in Indonesia. But unemployment remains a difficult problem to solve. Average economic growth within the last 30 years records 6.7 percent. During the period, Indonesia's manufacturing sector has contributed highly to economic growth. In the same time, the contribution of oil and gas as export earning tends to decline. The export has been dominated by non-oil and gas commodities.

This study mainly aims to analyze the relationship between employment and non-oil and gas export. The simple regression method is employed.

The result shows that non-oil and gas export positively and significantly affect the level of employment. While, the GDP and wage positively also affect the level of employment. However, economic crisis in 1997-1998 does not significantly affect the level of employment.

Keywords: employment, non-oil and gas export, simple regression.

ABSTRAK

Nama   : Achmad Sigit Santoso

Program   : Magister Perencanan dan Kebijakan Publik

Judul   : Pengaruh Ekspor Non Migas Terhadap Penciptaan Lapangan Kerja di Indonesia.

Tingkat pengangguran yang tinggi merupakan masalah yang cukup krusial bagi Indonesia. Berbagai upaya telah dilakukan oleh pemerintah dalam rangka mengurangi tingkat pengangguran di Indonesia. Namun pengangguran tetap merupakan permasalahan yang sulit untuk dipecahkan. Pertumbuhan ekonomi dalam kurun waktu 30 tahun terakhir mencatat angka rata-rata 6.7 persen. Pada periode yang sama, sektor manufaktur Indonesia memberikan kontribusi yang tinggi terhadap pertumbuhan ekonomi. Pada saat yang sama, minyak dan gas bumi Indonesia mengalami kecenderungan untuk turun dalam perolehan keuntungan ekspornya. Ekspor Indonesia lebih didominasi oleh ekspor non-migas.

Studi ini secara umum bertujuan untuk menganalisa hubungan antara penyerapan tenaga kerja dan ekspor non-migas Indonesia. Studi ini menggunakan metode regresi sederhana.

Hasil dari estimasi data menunjukan bahwa ekspor non migas Indonesia secara positif dan signifikan mempengaruhi tingkat penyerapan tenanga kerja di Indonesia. Sementara itu, PDB dan upah di Indonesia juga secara positif mempengaruhi tingkat penyerapan tenaga kerja. Namun, krisis ekonomi pada tahun 1997-1998 secara signifikan tidak mempengaruhi tingkat penyerapan tenanga kerja di Indonesia.

Kata Kunci: penyerapan tenaga kerja, ekspor non migas, regresi sederhana.

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Chapter 1
INTRODUCTION

1.1. Background

Export is a particular way for every country to get/obtain market advantages from other countries in the world. Indonesia is one of those countries that commit it. That is why; Indonesia with more than 240 million populations has developed goods and services to be exported to foreign countries. Furthermore, trade will make people either to survive or to give them opportunities to make much better life. This thing could be happened in a country such as Indonesia.

There are two kinds of goods that a country trades with others. There are petroleum and natural gas as the natural resources energy and non-oil and gas goods as consumptive goods which people use to fulfill their needs. Every country needs them, that is why, if they do not have it in their own country then they have to import it from another country which has much more supply.

In the decade of 1980s until the 1990s, Indonesian which is one of the biggest oil and gas exporters in the world has gotten many advantages from exporting it. There was an oil and gas era, where the prices had increased into higher level. Therefore, Indonesia determines oil and gas commodity as the major income for the country. However in 2000s, Indonesia cannot be dependent on oil and gas as the main export commodity anymore, because the supply of oil and gas in Indonesia are limited now. Furthermore, Indonesia must import it to fulfill the domestic needs. In 2007 Indonesia resigned from OPEC (Organization of the Petroleum Exporting Countries) membership. Then government tried to find the alternative ways to solve the problems. One of the alternative ways is by developing the non-oil and gas sector to replace the oil and gas sectors that could not provide revenue anymore. The non-oil and gas sector also provides a great opportunity in creating the employment n Indonesia.

There are four kinds of non-oil and gas sector that can be exported by a country. They are agricultural sector, mining sector, manufacturing sector and services sector. Today, those sectors are potential to provide employment in

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Indonesia. Indonesia has strength in the international market of agricultural sector and mining sector, because they still has opportunity in the world's market. Although, the biggest non-oil and gas export is contributing by manufacturing sectors. The countries such as Thailand, Malaysia and Chinese have led the market share in the world. Actually, Indonesia has potency in agricultural commodity to compete in the world market because Indonesia has a potential strengthen in this sector. Indonesia has a strategic geography which is located in a tropical climate and it also has a big population. In addition, Indonesia has more thirteen thousand of islands that have fertility land. It is an opportunity for Indonesia to develop more competitive product in agriculture. It is also a great chance for Indonesian government to create a new job for Indonesian people.

In developing the country, Indonesia has many problems. One of the biggest problems for Indonesian government is unemployment. The unemployment rate in Indonesia is high, even though it decreases gradually. According to BPS (Badan Pusat Statistik), in 2007 Indonesia has 9.75 percent opened unemployment or there are 10.55 million people as unemployment. Then, unemployment level decreases into 9.42 million people in 2008.

Unemployment in Indonesia	2004	2005	2006	2007	2008
Total Unemployment	10,251,351	10,854,254	11,104,693	10,547,917	9,427,590
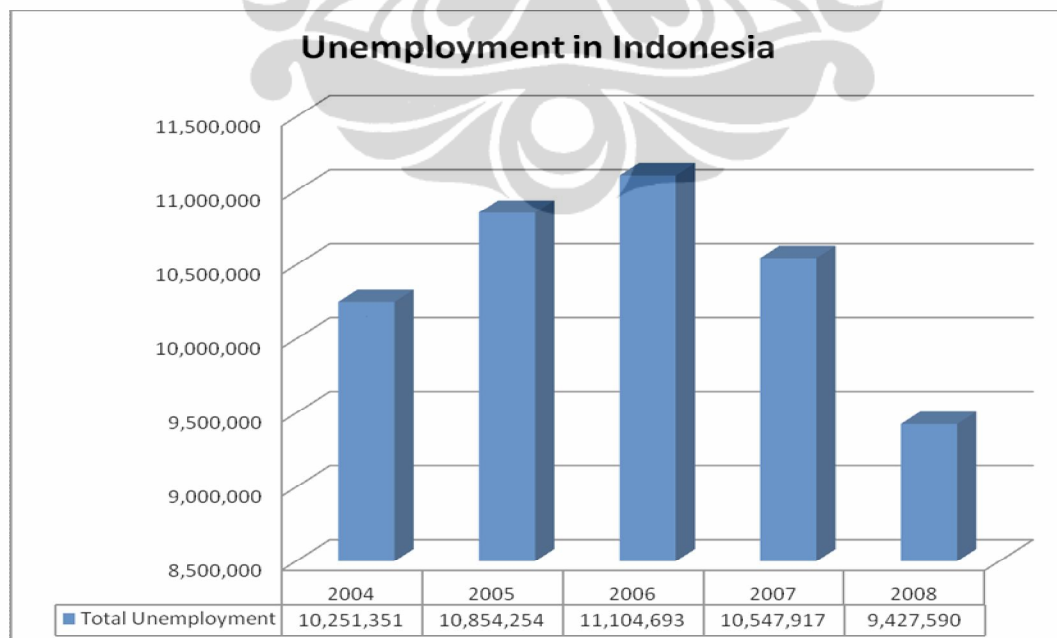
Figure 1.1. Unemployment in Indonesia

Source: Central Statistic Agency of Indonesia (BPS)

According to minister of coordinator of welfare sector, in 2008, the population of poor people in Indonesia is still quite a lot, which is 34.96 million peoples (15.4 percent). While the number of unemployed in the year 2008 as many as 9.43 peoples (8.46 percent). Indonesian government with Government Plan Policy

(RKP) in 2009 took the theme "Better Welfare Peoples and Poverty Reduction ". In 2009, RKP has targeted that poverty will fall to 31 million peoples or reduce 14 percent, and the number targeted unemployment will fall to 7.8 million people or decrease 7 percent.

Meanwhile the economic growth increases each year. It can be seen from the BPS (Badan Pusat Statistik) data that the last increase in GDP (Gross Domestic Product) of Indonesia was up to 6.2 percent in the year 2007 with the net export contribution of 4.8 percent. The Indonesia exporting growth reached USD 100.7 billion in 2006 or increased up to 17.5 percent in 2005, this figure is dominated by non-oil and gas sector in Indonesia which is has 79.3 percent of contribution.

Indonesian Gross Domestic Product

(billion rupiahs)

	2004	2005	2006	2007*	2008**
■ Gross Domestic Product	1,656,517	1,750,815	1,847,127	1,963,092	2,082,104
■ Gross Domestic Product Without Oil and Gas	1,506,297	1,605,262	1,703,422	1,820,512	1,939,250
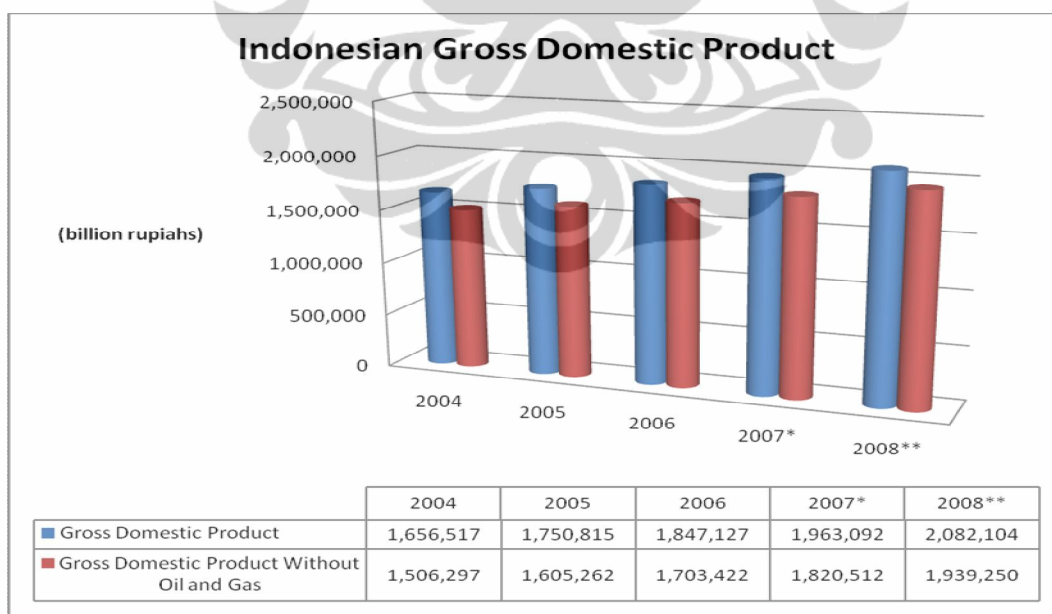
Figure 1.2. Indonesian GDP

Source: Central Statistic Agency of Indonesia (BPS)

Note: * Temporary Number

            ** Most Temporary Number

There are many factors why the rate of unemployment is still on the highest level. One of them is caused by low investment that comes into this country. This condition is created by the factor of domestic investment climate that cannot stimulate new investment in the real sector. Investment climate are closely tied to the capability of the facilities and the infrastructures provided by government because bureaucratic and infrastructure will provide adequate value for the particular investors to build the business. The companies can reduce the production costs and then as a result the production will be more efficient and effective. Intensive large volume of export can be reached by having large investment and creating competitive products in the international market.
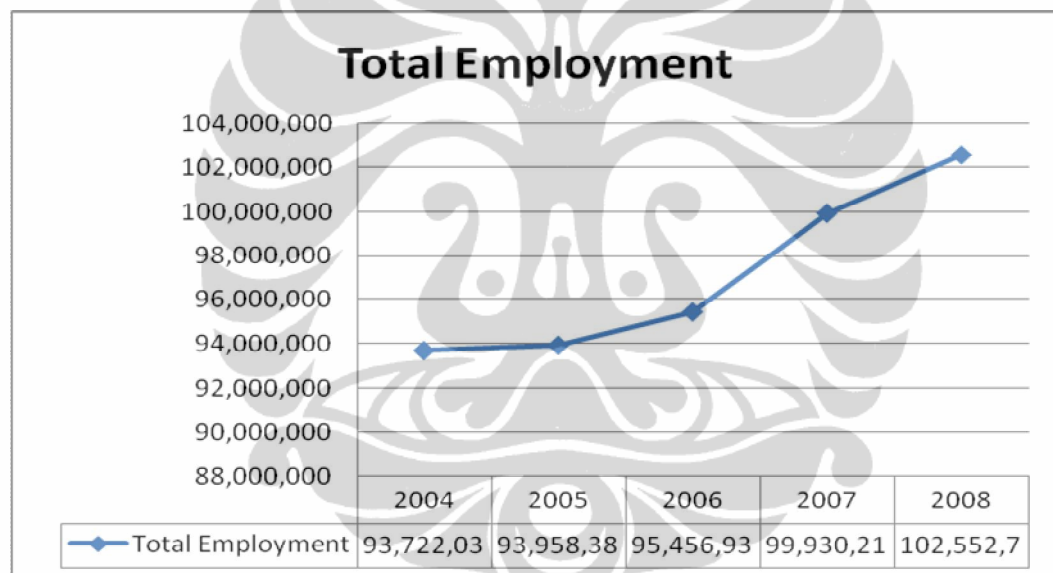
Figure 1.3. Indonesian Total Employment

Source: Central Statistic Agency of Indonesia (BPS)

Large export will increase the revenue that impacts in creating new investments or adding the capital. Furthermore, the new investments will create new jobs for the labors and it will also increase the wages. Higher wages will raise the purchasing power of the consumers and finally the economic condition will improve.

1.2.   Research Objective

The objective of this research is to analyze the impact of non-oil exports on employment creation in Indonesia. This objective tries to find evidences that the increasing of non-oil and gas export can create new jobs, and also to find the evidence that the wages, gross domestic product and crisis economic condition can influence job creation in Indonesia.

1.3.   Research Scope

The limitation of this study is just to analyze the non-oil and gas exports that have a relationship with the creation of employment in Indonesia. According to BPS (Badan Pusat Statistik) definition and classification, this research will derive agricultural, mining, services and manufacturing sectors as a non-oil and gas data. Non-oil and gas exports will become the indicators of real investment in the agricultural, mining, services and manufacturing sectors because the real investment is expected to absorb more labors. Therefore, the component variables which become the focus of this analysis are the value of Indonesian non-oil and gas export to the country and the value of the increasing growth of employment in Indonesia followed by the decreasing in the number of unemployment in Indonesia.

1.4.   Research Methodology

Based on previous study, this Research uses linier regression method that is the Ordinary Least Square (OLS). The method is used to provide the relationship between the independent variable and the dependent variable. This method will also see how far the influence of independent variable against dependent variable. The employment growth is endogenous or act as dependent variable and the value of Indonesia non-oil and gas export, non-oil and gas import, wages, Indonesian GDP, inflation and economic crisis are exogenous or independent variables.

The model can be written as:

$$E = f(X_{nog}, M_{nog}, w, K, GDP, I, DC)$$

Where:

E   = Employment of Agricultural and Manufacturing

X_{am} = Non-Oil and Gas Export

M_{am} = Non-Oil and Gas Import

K   = Capital Stock

GDP   = Gross Domestic Production

I   = Inflation

DC   = Dummy Crisis

1.5.   Research Coverage

This research will use time series data during 1980 until 2007. The data used is secondary data taken from Central Statistic Agency of Indonesia (BPS), International Financial Statistic (IFS), Indonesian Ministry of Man Power and Transmigration, Indonesian Ministry of Trade, Indonesian Ministry of Industry and internet sources.

1.6.   Organization of Study

The outline of study is as follow:

Chapter 1 : Introduction

1.1   Background

1.2   Research Objective

1.3   Scope of Research

1.4   Research Methodology

1.5   Research Coverage

Chapter 2 : Literature Review

2.1   Phillips Curve Theorem (Employment Theorem)

2.2   Stolper-Samuelson Theorem (Income Distribution Theorem)

2.3   Factor Price Equalization

2.4   Heckscher-Ohlin Model

2.5   Cobb-Douglas Production Function

2.6   Concept and Definition Related to Labor Force in Indonesia

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Chapter 2
LITERATURE REVIEW

2.1   Phillips Curve Theorem

It began in 1958 when Phillips tried to analyze the relationship between inflation rate or wage and employment creation which was happened in the United Kingdom in 1861-1957. He found evidences about negative relationship between inflation rate or wage and unemployment growth. There is a negative movement along the curve, it moves from high level in the left side then fall into lower level in the right side. It means that the increasing price inversely proportional to the rate of unemployment. The increasing price or inflation will fall into the lowest level, if the unemployment rises to the maximum level. In addition, the unemployment rate will be in lower level if the inflation of the country getting up to a higher level. Phillips described his theory with a figure as follow:
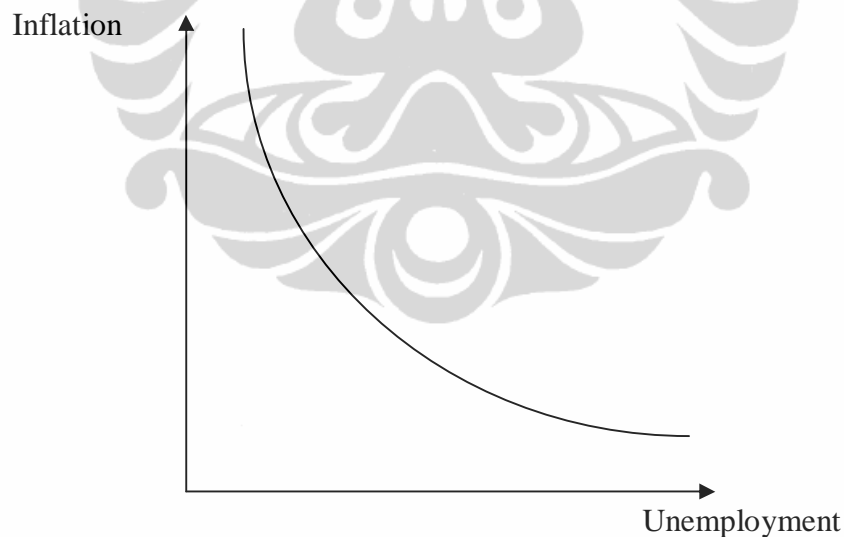
Figure 2.1. The Phillips Curve

Source: Dornbusch, 2004

According to the figure above, Phillips argued that the expected price level are given that the worker take to be last year's price level, the lower unemployment growth makes nominal wages get higher and the higher nominal

The impact of non..., Achmad Sigit Santoso, FE UI, 2010.

wages can lead the price to a higher level. More increase the price levels then higher the inflation level. That's why lower of unemployment could make inflation grow up. This theory sometimes called the wage-price spiral. (Blanchard, 2006)

Phillips curve theorem is the basic concept in macroeconomic to be applied as policy analysis. This concept is used by policymaker to manage unemployment and inflation within a monetary policy. The opposite of unemployment and inflation in Phillips curve theorem make policymaker have to make deal with two situations that are having trade off with each other.

The evidence of Phillips curve theorem found in the United States case. For instance, this condition showed and proved in the United States. The inflation rate increased from 1.0 percent up to 5.5 percent then unemployment rate declined from 6.8 percent to 3.4 percent. It was happened in 1961 to 1969. The research had done by Paul Samuelson and Robert Solow by using data from 1900 to 1930. They found same evidence that inflation has negative relation with unemployment rate. Phillips derived his curve to the equation as follow:

$$\pi_t = (\mu + z) - \alpha u_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2.1)$$

Where:

π_t : Inflation rate at t time

μ : Markup

z : others factor

α : Parameter

u_t : Unemployment rate

Meanwhile, there are several critics to this theory. Many countries had experienced on their economic condition where inflation rate go to up level at the same time they had high unemployment. It happened in The United States of America and most Organization for Economic Cooperation and Development (OECD) countries in 1970s. There was a condition where high inflation and high unemployment happened at the same time. It indicated that Phillips curve theorem

did not worked, it was caused by increasing oil price that gave effect in increasing non-labor cost. It pushed firms to increase their price relatively than the wages increased. This condition can stimulate the increasing of buying power that makes effect in increasing the price of consumptive product. In the other words, the rising price indicates inflation for getting up. This effect do not have any correlation with inflation and unemployment because inflation is caused by oil price rising. Oil price only makes effect to the mark-up μ in equation.

Phillips curve theorem can be applied only in the short run period. On the contrary Phillips curve theorem could not explain the long run. It has a stagflation condition where inflation and unemployment rate are increasing together at the same time. It is happened because of rationally expectation and Non-Accelerating Inflation Rate of Unemployment (NAIRU). The NAIRU condition is shown by the vertical line in the curve. It shows that unemployment rate is stable. In other words, there is no change in unemployment rate in the long run period. Because in the long run period, unemployment rate will return to the same point as the unemployment rate started in the beginning. It shows in the figure as follow:
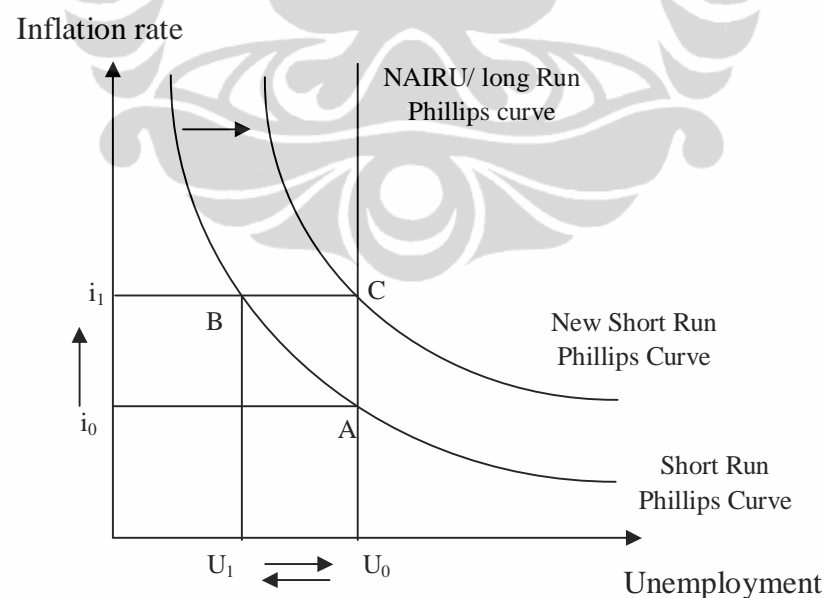
Figure 2.2. Long Run and Short Run Phillips Curve

Source: Britannica Concise Encyclopedia

The figure shows us about the short run Phillips curve and the long run Phillips curve. If the unemployment rate is at point A, then there will be a stable rate of inflation. Besides, if the policy makers decide to decrease unemployment from U_0 to U_1 in the short-run, and it will lead to an increase in the rate of inflation from i_0 to i_1, then it will shift point A to point B. Then, in the long run the unemployment will increase as well and as a result stagflation occurs to U_0. There is no trade off between unemployment rate and inflation rate in the long run, because the natural rate of unemployment which is increased the unemployment rate return to the beginning point it happened.

2.2 Heckscher-Ohlin Theorem

The famous theorem of international trade is Heckscher-Ohlin Theorem. This theory explained about two countries that have different of intensive input to produce different good can trade each other in international market. Heckscher-Ohlin theorem had several assumptions. There are two nations, two commodities with two factor of production. The two nations such as nation 1 and nation 2, the two commodities such as commodities X and Y, and the two factor of production such as labor and capital. Both nation use same technology to produce the commodities. Commodity X produced with labor intensive and commodity Y use capital intensive. There is incomplete specialization to produce commodities in both nations. The tastes of commodities are equal in the both nation. The market type of commodities is perfect competition in both nations. There is perfect factor mobility within each nation, but there is no international factor mobility. There are no transportation costs, tariff, or other obstruction to the free flow of international trade. All resources of input are fully employed in both nation and international trade between the two nations is balanced.

In this theory, two commodities produced by two factor production. It can be called by commodity X produced by nation 1 with using capital intensive and commodity Y produced by nation 2 with using labor intensive. This condition can be shown by figure 2.4.
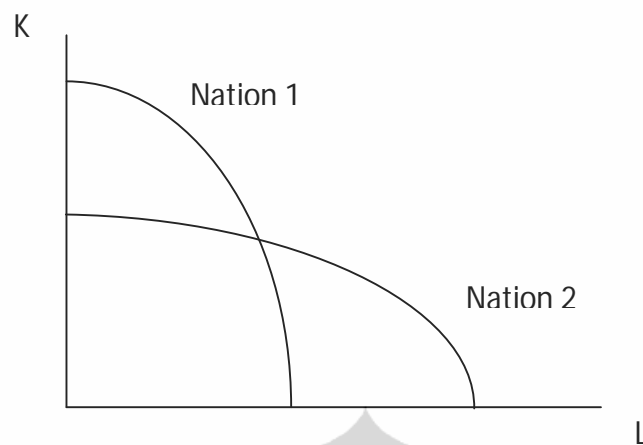
Figure 2.3. The Shape of Production Frontier

Source: Salvatore, 2007

According to the assumption, we can state that nation A will export the commodity whose production requires the intensive use of the nation's relatively abundant and cheap factor and import the commodity whose production requires the intensive use of the nation's relatively scarce and expensive factors (Salvatore, 2007). It means, nation 1 export commodity S that is capital (K) intensive commodity and K is the relatively abundant and cheap in nation 1. On the other hand, nation 2 export commodities C that is labor (L) intensive commodity. And L is the relatively abundant and cheap in nation 2. It can be seen in figure 2.5.
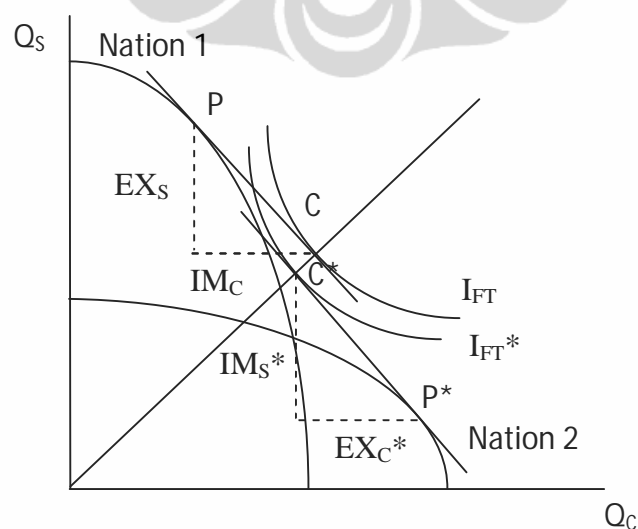
Figure 2.4. Free Trade on Heckscher-Ohlin Model

Source: Suranovic, 2003

The Nation 1 produces at point P. The tangent line at P represents the national income line for the Nation 1 economy. The equation for the income line is $P_C Q_C + P_S Q_S = NI$, where NI is national income in dollar terms. The slope of the income line is the free trade price ratio $(P_C/P_S)FT$. Consumption in the Nation 1 occurs where the aggregate indifference curve I_{FT}, representing preferences, is tangent to the national income line at C. To reach the consumption point the Nation 1 exports EX_S and imports IM_C.

Nation 2 produces at point P*. The tangent line at P* represents the national income line for the Nation 2 economy. The slope of the income line is also the free trade price ratio $(P_C/P_S)FT$. Consumption in Nation 2 occurs where the aggregate indifference curve I_{FT}*, representing preferences, is tangent to the national income line at C*. Note that since the Nation 1 and Nation 2 are assumed to have the same aggregate homothetic preferences and since they face the same price ratio in free trade, consumption for both countries must lie along the same ray from the origin, 0C. For Nation 2 to reach its consumption point it exports EX_C* and imports IM_S*. In order for this to be a free trade equilibrium in a two-country model Nation 1 exports of S commodity must equal Nation 2 imports of S commodity $(EX_S = IM_S$*$)$ and Nation 2 exports of C commodity must equal Nation 1 imports of C commodity $(EX_C$* $= IM_C)$. In other words the Nation 1 trade triangle formed by EX_S, IM_C, and the Nation 1 national income line must be equivalent to Nation 2's trade triangle formed by EX_C*, IM_S*, and the Nation 2 national income line.

2.3 Stolper-Samuelson Theorem

Stolper-Samuelson began the theorem about income distribution in 1941. The theory discussed about the gain gotten by a country that doing international trade with other countries. The theory has an assumption that there are two countries that have two commodities which is different from each other. They have two different abundant that each country has. Country 1 is labor abundant and produces commodities with labor intensive. Then, country 2 is capital abundant and produces commodities with capital intensive. Country 1 and country

2 are trading each other. They will get gain from trade and the gain may give real income of labor rising in country 1. In addition, it is also happened in country 2 that the gain may give real income of capital rising.

International trade makes two countries will get some benefits and each country tends to special using abundant input in their product. The impact of international trade between two countries are; increasing the wages that country have special labor intensive, increasing the welfare, and the country that have specialized in capital intensive will increase in rent and so the welfare. As a result, they have some benefits from doing international trade both as a buyer and as a seller. This condition can be happened if the inflation rate is in stable level. That is why; trade barrier will decrease the return of scarce factors in term of commodities which had been produced by the country.

In another words, international trade will increase the real income of labor and will decrease the income of the capital owners in country 1 which has cheap labor and expensive capital. On the other hand, international trade will decrease the real income of labor and will increase the capital owners in country 2 which has expensive labor and cheap capital (Salvatore, 2007). This condition assumes that there is same technology used to produce goods and there has been a perfect completion market. Meanwhile, there are some weaknesses of Stolper-Samuelson theorem, such as: Stolper-Samuelson theorem cannot use the cross section data. The data available to use is time series data. Stolper-Samuelson theorem cannot exactly use for the short-run analysis; it suitable for the long-run data analysis.

2.4   Factor Price Equalization

Based on the assumption given by Heckscher-Ohlin theorem, Paul Samuelson (1970) developed the theory that became a new theorem as called factor price equalization theorem. This theorem explains about the other benefit of doing international trade for the countries. Factor-price equalization theorem talks about the relationship between relative price of factor production and relative price of commodity. He said that international trade will bring about equalization in the relative and absolute return to homogenous factors across nations (Salvatore, 2007).

International trade will make the level of labor's wages, training, skills and productivity similar in all trading countries. The same condition also occurs in the country with capital abundant to produce commodities by using capital intensive. Then the trade can be created by two conditions where the countries have abundant input factor in producing goods.

The country that has specialized in producing commodity with labor intensive will increase in profits. In addition, it will reduce on producing commodity with capital intensive. Then, the relative demand of labor raises that followed by increasing wages (w). Meanwhile, the demand of capital will fall and make the interest rate (r) falls. For example, country 1 which has labor abundant produces X labor intensive commodity trades with country 2. It makes the demand for labor increases in country 1. Then, it will raise the relative price for labor by increasing wages (w). It can be shown by the graphic as follow:
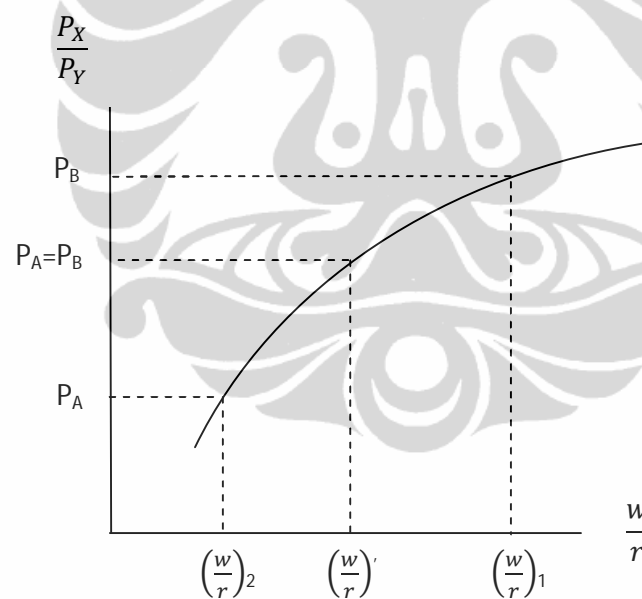
Figure 2.5. Factor Price Equalization
Source: Salvatore, 2007

On the other hand, the increasing of relative price of labor is not followed by increasing other factors such as capital. In the other words, relative factor price of capital falls by a reduction of interest rate (r). Meanwhile, country 2 that is

using capital factor of production as intensive component of production to produce commodity Y has experienced an increase relative price of capital. It makes the interest rate (r) raises and at the same time, demand for labor falls by reducing wages (w). This implies that international trade will equalize the wages of workers and rents earned on capital.

Then, international trade tends to reduce the pre-trade difference in wages rates and interest rates between those two countries. In addition, international trade not only tends to reduce the international difference in the return of homogenous factors but in fact also to bring about complete equalization in relative factor prices when all the assumptions are hold.

2.5 Cobb-Douglas Production Function

Production function that Cobb-Douglas theorem said in 1928 explained the relationship between the supply side performance or output growth as dependent variable to labor input on production, capital input, and total factor productivity. Meanwhile, total factor productivity tells about information in technology and efficiency allocation. They derive the function as follow:

$$Y=AK^{\alpha}N^{\beta} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (2.1)$$

where:

Y	= Real GDP
K	= Capital Input
N	= Labor Input
A	= Total Factor Productivity
α	= Capital Share
β	= Labor Share

The Cobb-Douglas production function mention that output growth (Y) which is called Real GDP is influenced by the change of capital input (K), Labor Input (L), and total factor of productivity (A). Therefore, increasing in both variables (Labor and Capital) can raise the total output. They have positive impact to output growth to capital and labor variables (as input of production). Other

variable that influence directly and indirectly in production process included in total factor productivity (A).

The increasing of output caused by increasing of labor input is called MPN (Marginal Product of Labor), and the increasing of output caused by increasing of capital is called MPK (Marginal Product of Capital). These variables (MPN and MPK) are having the law of diminishing return. It means the increasing of MPN or MPK can increase unlimited output. If the increasing over the limit, it makes the output return to decrease. In other words, MPN and MPK have the maximum point that is called peak point.

Meanwhile, capital share (α) and labor share (β) are the parameter of the change of labor and capital. These determinants are variables that influence the nominal change of labor input and capital input. There is elasticity of labor and capital input as one of the production function equation variables. Capital share and labor share reflect the value of technology availability in the economy. The elasticity is equal to percentage of change in these variables. Thus, the changes of output growth in Cobb-Douglas production function are considered by input elasticity of labor and capital.

According to the production function theorem, the function has parameter that can be identified by the change of value of the function, and it is called return to scale. Returns to scale refer to change in output subsequent to a proportional change in all inputs (where all inputs are increased by a constant factor). If the output is increased by that same proportional change then there are constant returns to scale (CRTS). If the output is increased by less than that proportional change, this condition is called as decreasing returns to scale (DRS). On the other hand, if the output is increased by more than those proportions, the increasing returns to scale (IRS) occur.

2.6 Empirical Study

This study which is the impact of non-oil and gas export on employment creation in Indonesia is based on the previous study of Darojah (2009). In her study, she discussed about assessing the impact of net-export and other variables on employment creation in Indonesia. She mentioned about the impact of net-

export and other variables related with employment creation in Indonesia. She used total net-export variables as one of main independent variables. There are any variables that had used as gross fixed capital stock, average minimum wage, gross domestic product and dummy.

In her study, she uses Ordinary Least Square method to run the data. She used secondary type of data during 1986 until 2007 and it estimated by Eviews as a tool of regression. The model was in double log form and the result of estimation process is that the net export variable had significant impact to the employment creation with 1 percent confidence level. Net export variable had coefficient of 0.03 that means every 1 percent increase in net export will increase employment creation by 0.03 percent. The second variable, wages, had significant effect to the employment. This variable had a significance level 0.025 at 5 percent confidence level. It variable had coefficient 0.01. And the last variable that contributes to the employment variable is Indonesian GDP. This variable has a significance level 0.00 at 1 percent as confident level to employment variable with coefficient number of 0.28.

Another empirical study is done by William E. James and Natsuki Fujita (2000). They used Input-Output analysis as a tool to analyze the problem. their study entitled Employment and Manufacturing Exports in Indonesia: An Input-Output Analysis. In their paper, they estimate the employment effects of manufactured exports in two sub-periods, 1985-1990 and 1990-1995. They used three of input-output (I-O) tables, the year were published in 1985, 1990 and 1995.

Their study discussed about manufacturing exports. The industry responded positively to export goods of international trade reform. Because of this industry has created new jobs. It is happened directly or indirectly through the industry chain. In the period 1990-1995 the employment creation grew much faster than the growth in the period 1985-1990. In the period 1985-1990, the largest job creation happened in the manufacturing sector that produces the primary and tertiary goods. Whereas, Indonesian services sector was the largest growth of employment creation in 1990-1995. And in this period, the reduction of raw wood export will be followed by employment reduction.

Other study is related to this research is the one written by TK Jayaraman and Baljeet Singh (2007). Their research entitled foreign direct investment and employment creation in pacific island countries; empirical study of Fiji. Their study consists of four phases of work. First, they do stationary test of the model they make. The data they use is the data time series with variables as follows: GDP, FDI, and employment. In the second step, they do a search for possible long-term relationship between variables using co integration tests. The result showed there was two of co integration. They are employment in the formal sector and the GDP which is the endogenous variable. Results of the co integration test revealed that GDP and foreign direct investment have positive sign and the effects are statistically significant to employment in Fiji. It is core on the fourth step, they use Granger causality test between the variables. The result showed that the direction of causality within length of foreign direct investment on employment and the direction causality between foreign direct investment and GDP in the short term.

The summary of previous studies above related to the topics is presented in table 2.1.

Table 2.1. The Empirical Study

No	Author	Year	Title and Methodology	Objective and finding
1	William E. James and Natsuki Fujita	2000	Employment and Manufacturing Exports in Indonesia: An Input-Output Analysis	· They estimate the employment effects of manufactured exports in two sub-periods, 1985-1990 and 1990-1995 · The industry responded positively to export goods of international trade reform · In the period 1990-1995 the employment creation grew much faster than the growth in the period 1985-1990

				· In the period 1985-1990, the largest job creation was happened in the manufacturing sector.
2	TK Jayaraman and Baljeet Singh	2007	Foreign Direct Investment and Employment Creation in Pacific Island Countries; Empirical Study of Fiji. OLS regression and Granger causality test	· GDP and foreign direct investment have positive sign and the effects are statistically significant to employment in Fiji. · There is direct causality within length of foreign direct investment on employment and there is direct causality between foreign direct investment and GDP in the short term.
3	Hikmatul Affifah Darojah	2009	Assessing The Impact of Net-Export And Other Variables on Employment Creation in Indonesia. OLS regression	The net export, wages, and GDP variables had significant impact to the employment creation in Indonesia.

Based on previous study, this thesis will employ the same method with Darojah (2009). However, this thesis will use total employment data as dependent variable while independent variables are non-oil and gas export, Indonesian GDP, real wages, and economic crisis as dummy variable.

Chapter 3
AN OVERVIEW OF NON OIL AND GAS EXPORT AND EMPLOYMENT
IN INDONESIA

3.1.   Indonesian Non-Oil and Gas Output

After the declining of oil boom, oil and gas sector did not dominate Indonesian export again. This is because of the reduction of supply capacity that Indonesia had. Therefore, Indonesia must develop and improve the industrial sector. The pattern of Indonesia's economic structure has changed. The changed is same as the trend of structural transformation process that occurs in many countries in the world, where there is a decline in the contribution of the agricultural sector. Meanwhile, the contribution of other sectors and industries tend to increase.

It began during the period 1967-1997; Indonesia had 10.9 percent of the growth of manufacture sector. The contribution of the manufacturing sector has reached 26.8 percent of GDP, while the agricultural share of 16.1 percent recorded. In 1967, manufacturing sector contributed 7.5 percent to the overall of economy, and the highest contributor is the agriculture sector which is contributing 53.9 percent. In 1974 the mining sector had just been jumped to 22.2 percent contribute to Indonesian GDP that was had 9.3 percent before, even in 1980 reached 25.7 percent. This condition is exceeding the role of the agricultural sector that just reached 24.8 percent.

The data showed that the growth of Indonesian manufacturing sector is increasing to become in the level of 10.3 percent at 1982-1996. At the same time, this level is much better than the level of the Indonesia economic growth experienced that is 6.1 percent. Meanwhile, the Indonesian economic growth just stays away in one digit of growth level. That is 6.7 percent.

During the ten years up to year 2004, the contribution of the manufacturing industry to the Indonesian economy is on the average 26.9 percent, where the number of non-industrial processing of oil and gas was contributed 86.5 percent and the rest is oil and gas processing industries.

In 1994, the industrial branch of the dominant role of non-manufacturing industries are non-oil and gas industries of food, beverages and tobacco with 45.4 percent followed by the fertilizer industry, chemical and rubber goods and transportation equipment industry, machinery and equipment by 13.3 percent . While the basic metal industries of steel and cement industries and non-metallic mining products are still low at only around 3.1 percent. Transportation industries such as machinery and equipment, with a role that continues to increase from year 1999 to only 5.9 percent, in 2000 increased to 20.7 percent and consistent until the year 2004 that reached 26.5 percent. Figure 3.1. Shown that Indonesian manufacture which is having large scale had increased in the output production. Except, in 2003 output of industries went fall down to Rp 822 trillion. It happened at middle industries that had amount Rp 16 trillion. Beside, after that year, medium and large industries getting raise again.
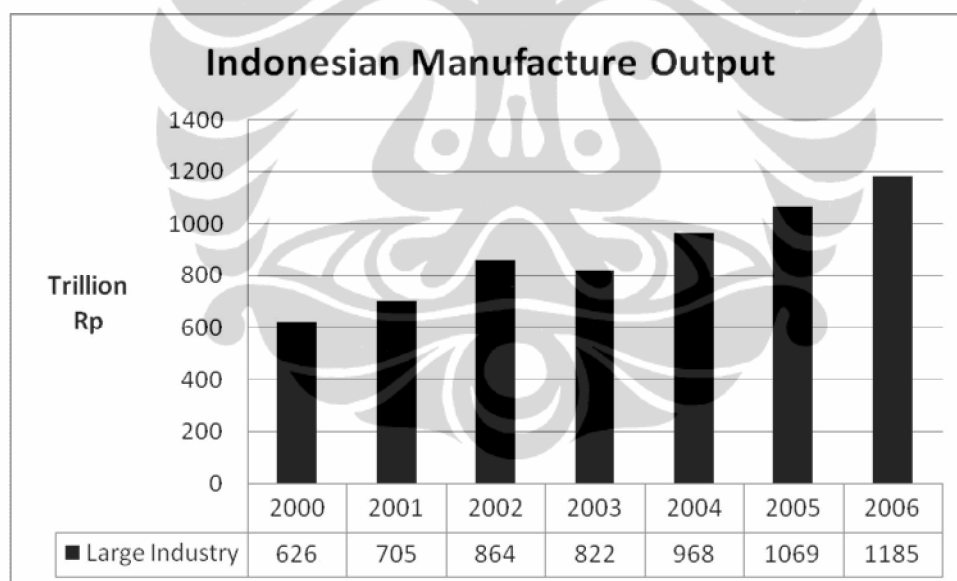
Figure 3.1. Indonesian Large Industries Output

Source: Indonesian Ministry of Industry (processed)

According to data in 2004, small and medium industries had amounted about 2.74 million units, while the large industrial only around 3879 units. This condition is so contrast with the GDP that small and medium industries are produced, small and medium industry only produces amounting to 119 trillion rupiah of GDP with constant price in 2000. It's similar with 28.4 percent of the

entire output of the industrial sector. Then, the remaining which is having 61.6 percent is produced by both large industries; private enterprises and government enterprises.

Figure 3.2. Indonesian Middle Industries Output

Source: Indonesian Ministry of Industry (processed)

3.2. Indonesian Non-Oil and Gas Export

In the year, Indonesian export had increased. Its happened by causing the increasing of total Indonesian export such as USD 24,301.2 million. The increasing export happened in 1991 to 1997. It continued in 2000 to 2006 that had 15.35 percent a year. The increasing of exports of non oil and gas sector contributes to the growth value greater than the total export growth value 77.9 percent in 2006. In general, non-oil and gas exports increased from 2000 to 2006 by 58 percent.
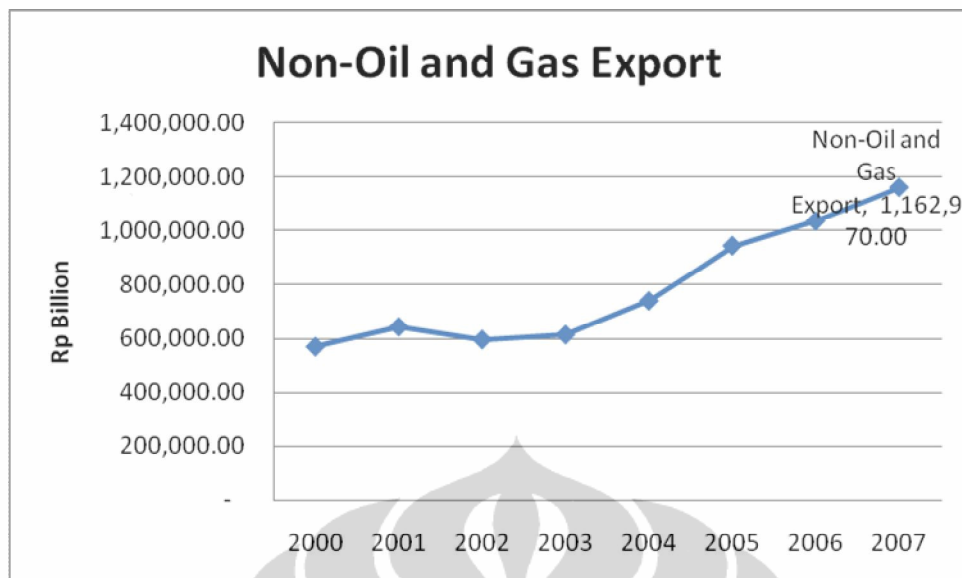
Figure 3.3. Indonesian Non-Oil and Gas Export

Source: International Financial Statistic

In 2000 Indonesia's exports increased by USD 62.14 million. However, this increasing of Indonesian export growth is not necessarily smooth, non-oil exports decline in Indonesia 1997-1998 year caused by world monetary crisis. This decrease occurred for 8.6 percent and 0.4 percent. The decline also occurred in the year 2001 by 9.3 percent.

In 2002-2006, the biggest contribution exports to the world are supported by non-oil and gas sector. It's about in 77 percent to 79 percent. The increase of export value is more dominated by the Indonesian manufacturing sector that has comparative advantage in textiles and wood products processing. In May 2009 Indonesia's export performance increased by 9.5 percent. This condition was much better then at the same month of 2008. There is having a decline as amount -28.3 percent. During the month of May 2009, Indonesian total exports reached USD 9.3 billion, it's consisting of oil and gas exports amounted to USD 1.1 billion and non-oil of USD 8.2 billion. Cumulatively, exports from January to May 2009 is USD 40.5 billion or 29.7 percent lower than at the same period in 2008.
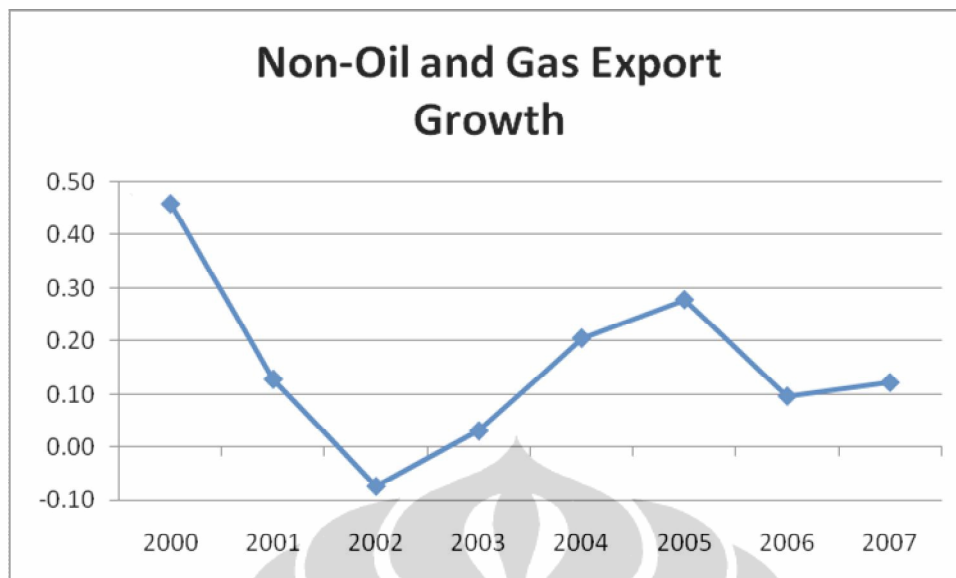
Figure 3.4. Indonesian Non-Oil and Gas Export Growth

Source: International Financial Statistic (proceed)

The increasing non-oil and gas exports in May 2009 are due to the growth of commodity exports 23.5 percent by mining sector. It is from USD 1.3 billion to USD 1.6 billion. However, when it is compared to May 2008, exports of industrial products increased 25.5 percent from USD 1.2 billion. Meanwhile, industrial output and agricultural products respectively rose by 11.4 percent and 5.5 percent. The increasing of agricultural exports value is due to rising world demand then followed by increasing international prices of agricultural commodities. Meanwhile, exports of industrial commodities rose from USD 5.6 billion to USD 6.3 billion. For the period January-May 2009 the industrial sector was the largest contributor to the non-oil and gas exports reaching 77.7 percent. While mining and agriculture sectors respectively contribute 17.8 percent and 4.5 percent of total non-oil and gas export.

The biggest non-oil and gas export destination Indonesian exports are Japan, European Union, and the United States. European Union market contributed 11.96 percent in 2006 and 13.66 percent in 2007 from the total value of Indonesian non-oil and gas exports.
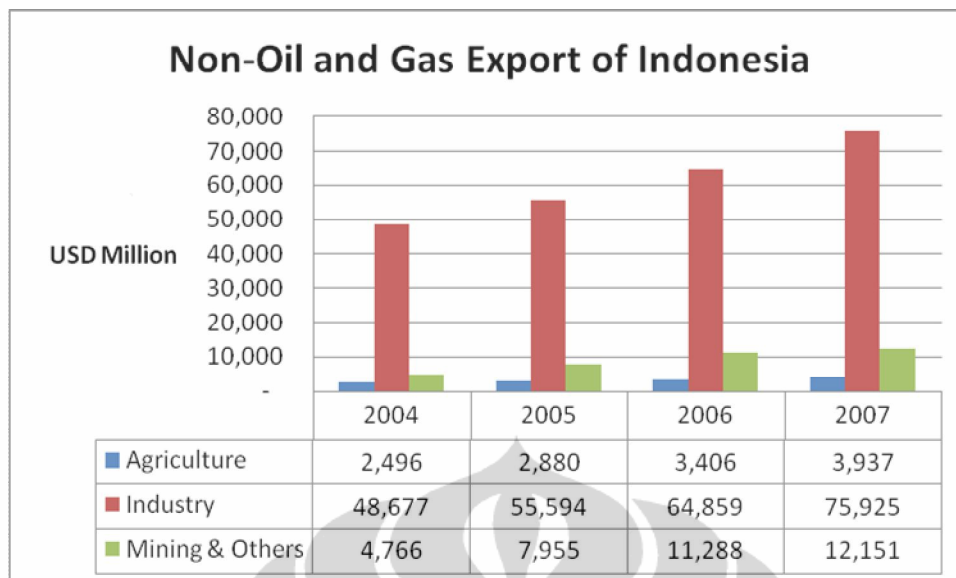
Figure 3.5. Non-Oil and Gas Export of Indonesia

Source: Indonesian Ministry of Trade

In 2008, increasing non-oil exports was also caused by increased exports of some major product groups based on 2-digit HS items. The export of ten major products based on the 2-digit HS was increased 20.5 percent. Meanwhile, total non-oil and gas exports fell 11.6 percent from previous year. Some 2-digit HS experience the largest increase in exports of ores, metals and Abu crust (HS 26) rose to 144.97 percent; Vehicles and Parts (HS 87) are up 9.47 percent, fats and animal oils/vegetable oils (HS 15) decreased 51.93 percent, while rubber and rubber products (HS 40) decreased 44.45 percent. While the products which having a decrease in exports value from previous year, up 12.9 percent; Wood and articles of wood (HS 44) fell 23.58 percent.

3.3. Indonesian Employment

According to the data from Indonesia Central Statistics Agency (BPS), in 2002, Indonesia has 9.13 million open unemployed; Approximately 450 thousand of them are university educated. The most of the 5.78 million unemployed is people who are young age in 15-24 years. In addition, there are 2.7 million unemployed who were not possible to get a job. In other words, they are hopeless to get a job. In the year 2002, the number of unemployed that half worked less than normal working hours that is 35 hours a week, amounted to 28.87 million

people. Some of them are working at a lower position than the level of education. They have low wages and low productivity. Thus the problem of open unemployment and a half of unemployed amounted to 38 million people who need to be resolved.
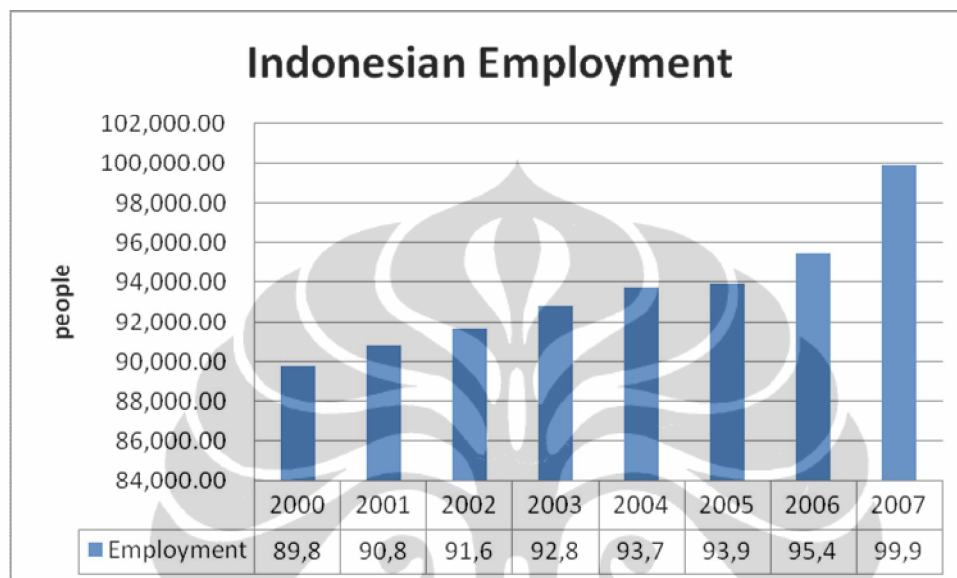
Figure 3.6. Indonesian Employment

Source: Indonesian Central Statistic Agency

In 2008, the number of unemployed in Indonesia fell by 1.12 million people or approximately 10.6 percent within a year. During 2008, the number of unemployed in Indonesia was recorded down to 9.43 million people, compared to unemployment rates in 2007 which are 10.55 million people. The level of open unemployment in Indonesia went down and reached 8.46 percent compared to 2007 that the amount is 9.11 percent. Meanwhile, in February, Indonesian working population goes to 102.55 million. This condition increased about 503 thousand, or 2.62 million increases compared to 2007.

Therefore the total number of working labor force and unemployment reached 111.95 million in 2008. It is an increase 2.01 million compared to the number in 2007. In addition, in 2008, Open unemployment rate reached 8.39 percent. And, this level is less than the number in 2007 that reached 9.11 percent. Meanwhile, labor force participation rate reached 67.18 percent in 2008 it is increased 66.99 percent in 2007. The social services are the sector that has

increased employment in 2008. This sector was increased 1.08 million people such as; servant job, good carpentry, carpenter, mason and cleaning services. At the time, the condition of trade sector was raised 677 thousand people and transport rose 220 thousand. The agricultural sector decreased to 1.36 million employees. On the other hand, the employment in agricultural sector is remaining as the largest number. That is 41.33 million or 40.33 percent.

In 2008, a resident who worked as laborers or employees is as much as 28.18 million or 27.5 percent. Meanwhile, a temporary worker was 21.77 million or 21.2 percent. And, doing own business was 20.92 million or 20.4 percent. Although workers which is primary education background have experienced downward decline to 1.04 million people in the last year, but there still dominates. Unemployment rate which is having less than elementary school graduates are also much less than people that have more than a high school graduate.

SMEs still reached the high number of absorbing labor in Indonesia. It is because Indonesia has high number of SMEs sector. That's why, formal sector of employment had restrictive to grow up because of Industrial sector grow slowly. As a result, additional labor in this sector is still fairly small. In 2008, the industrial sector can only absorb 12.44 million workers. The small industry could create 99.5 percent of all jobs that are available.

Indonesian Employment in Large Industry

	2000	2001	2002	2003	2004	2005	2006
Large Industry	4336	4234	4223	4133	4182	4086	4689

thousand people

Figure 3.7. Indonesian Employment in large Industry

Source: Indonesian Ministry of Industry

Figure 3.8. Indonesian Employment in Medium Industry

Source: Indonesian Ministry of Industry

In terms of gender, participation of women in employment increased significantly. During August 2006-August 2007, the number of female workers increased 3.3 million people, the largest number in the agricultural sector and trade. While the number of male workers increased only 1.17 million people mainly in the service sector and construction sector.

Chapter 4
RESEARCH METHODOLOGY

This chapter explains the methodology that is used in this study. Chapter four contains five sub chapters; model specification, model estimation, data description and data source, methodology, econometric test.

4.1. Model Specification

This study is using econometric model to process the data to get the conclusion of the effect of non oil and gas export growth on employment creation in Indonesia. The model of the study is inspired by Greenaway, Hide, and Wright (1999), and Darojah (2009). The basic theory of Greenaway, Hide, and Wright (1999) model is a Cobb-Douglas production function theorem. Cobb-Douglas production function model are:

$$Q_t = A^\gamma K_t^\alpha N_t^\beta \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4.1)$$

Where:

Q = real output

K = capital stock

N = units of labor utilized

A = efficiency parameter

γ = factor changing the efficiency of production process

β = labor share coefficient

α = capital share coefficient

According to Cobb-Douglas model, employing more labor and capital will maximize the profit. Therefore, marginal revenue product of labor that is equal the wage (w) and the marginal revenue product of capital that equals the cost must maximize. Cobb-Douglas production equation logarithm will be

$$\log Q_t = \log A + \alpha \log(w/c)_t + \beta \log N_t + e \dots\dots\dots\dots\dots\dots\dots\dots(4.2)$$

Where:

$$A_t = e^{\delta 0T} M_t^{\delta 1} X_t^{\delta 2}, \quad \delta_0 \delta_1 \delta_2 > 0$$

Based on Cobb-Douglas production function above, Greenaway develop the equation to become

$$\log N_t = \beta_0 + \beta_1 \log X_t - \beta_2 \log M_t + \beta_3 \log (w/c)_t + \beta_4 \log Q_t + e \ldots\ldots\ldots(4.3)$$

According to his model, Greenaway estimate labor demand framework and estimate only on the impact of manufacturing trade on manufacturing employment. It's mostly closer to this study, the writer modify the last model to new model that will use to estimate the data. There are several modification with the model, such as this study not only using manufacturing classification, instead this study use manufacturing and agriculture classification as non oil and gas sector data. This study also input inflation as one of all variable in the model.

In 1997-1998, economic crisis was happened in Indonesia. Therefore, it is important to put crisis variable into the equation as dummy variable. Dummy variable indicate the presence or absence of qualitative attribute. The attribute could construct to artificial variable by taking on value 1 and 0. The presence is indicated by value of 1 and the absence is indicated by value of 0. Then, the equation could be as follow;

$$\log N_t = \beta_0 + \beta_1 \log X_t - \beta_2 \log M_t + \beta_3 \log K_t + \beta_4 \log W_t + \beta_5 \log Y_t + \beta_6 I + D_{crisis} + e \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.4)$$

The identification of symbol of variable that are model are;

N : Total Employment (Thousand Persons)

X : Total Non Oil and Gas Export F.O.B. (USD Million)

M : Total Non Oil and Gas Import C.I.F. (USD Million)

K : Gross Fixed Capital Stock (Billion Rupiahs)

W : Average Minimum Wage (Thousand Rupiahs)

Y : Gross Domestic Product (Billion Rupiahs)

I   : Inflation (Percentage)

D crisis : Dummy Crisis

e   : error

4.2.   Model Estimation

In statistics and econometrics, ordinary least squares (OLS) is a technique for estimating the unknown parameters in a linear regression model. This method minimizes the sum of squared distances between the observed responses in a set of data, and the fitted responses from the regression model. The linear least squares computational technique provides simple expressions for the estimated parameters in an OLS analysis, and hence for associated statistical values such as the standard errors of the parameters. OLS can mathematically be shown to be an optimal estimator in certain situations, and is closely related to the generalized least squares (GLS) estimation approach that is optimal in a broader set of situations. OLS can be derived as a maximum likelihood estimator under the assumption that the data are normally distributed, however the method has good statistical properties for a much broader class of distributions.

According to a kind of model specification and data base, this study use OLS to estimate the model by regressed data with Eviews which is a tool of computer program.

4.3.   Data Description and Data Source

There are many factors that influence the result of data processing by econometric method. Such as in Indonesia, there are many disturbances of the data that many data incomplete and couldn't used to regress the model.

Most the data that is used is deflated from nominal data into the real form. It could be done because the data must show the real condition for analyzes used. In addition, this study uses secondary data from any source. There are some varieties of data that are used. There are employment, non oil and gas exports, non oil and gas imports, wages, capital stock, GDP, world GDP, and exchange rates.

1.   N variable (Total Employment) as dependent variable.

It is important to define the concept and definition that related to Indonesian labor force. Because, we will get same perception and definition to understand how labor force can influence the economy and how the input factor can influence the labor force, especially in Indonesia. According to international labor organization (ILO), there are some classifications of population that can be defined as the labor force. There are working age group and non-working age group. Working age group is divided by two categories; (1) labor force; and (2) non-labor force. The definitions are shown as follows:

Working age population: persons who had age 15 years old and over.

Labor force: person of 15 years old and over who, in the previous week, were working, temporary absent from work but having job, and those who did not have work and were looking for work.

Out of labor: person of 15 years old and over who are not categorized in labor force, for example; student, housekeeper, housewife, etc.

Employment: a number of people who works for pay for duration at least one hour during the survey week. Unemployment consists of:

1. Person without work but looking for work.
2. Person without work who have established a new business/firm.
3. Person without work who were not looking for work, because they do not expect to find work.
4. Person who has made arrangement to start work at future starts.

Wages are the numeration paid to an employee by an employer, including payment in cash and or in kind. Employment, are classified into seven categories, there are:

1. Own business, those who does business independently.
2. Employer assisted by temporary workers/unpaid workers, those who does business assisted by temporary workers/unpaid workers.
3. Employer assisted by permanent workers, those who does business assisted by paid permanent workers (at least one worker).
4. Employee, those who work for institution or other person for pay.
5. Casual employee in agriculture, those who works at his/her own risk without the assistance of employees in agriculture sector. Agriculture

sector covers food crops, farm crops, forestry, animal husbandry, and fishery.

6. Casual employee not in agriculture, those who works at his/her own risk without the assistance of employees out of agriculture sector. Non agriculture sectors covers mining, manufacturing, electricity, construction, trade, transport, communication, financial service, housing, etc.

7. Unpaid worker, those who work without pay in a business operated by family, relative or neighbors.

Employment data was accessed from BPS that has thousand people as standard measurement. Employment definition that the study used is referring to International Labor Organization (ILO). It happened since in 1997 that Indonesian had hit by economic crisis. Based on ILO suggestion, Indonesia must change the concept of employment that had been done. It began from changing of limitation of employment age which is 10 years old to 15 years old and over that can be employed. In other words, Indonesia must implement ILO standard as Indonesian labor standard measurement. Definition employment by ILO is the number of persons of 15 years old and over who worked for pay or assisted others in obtaining pay or profit for the duration at least one hour during the survey week.

This thesis will use total employment data. This is due to the limited availability of employment data that divided based on the sector. So the total employment is the alternative data will be used to estimate the influence of non-oil and gas exports, GDP, wages and economic crisis on employment creation in Indonesia.

Total employment data represent perceived required data, namely employment on agriculture and manufacturing sector. Due to, this sector contributes a substantial amount to non-oil and gas export in Indonesia. These can be seen in figure 4.1 and 4.2, where agriculture and manufacturing sector provides the largest contribution to total employment in Indonesia. The contribution tends to decline over the years. The use of total employment might not suitable as dependent variable. However there is limited data that can be used as proxy. Therefore, this is the limitation of this study.
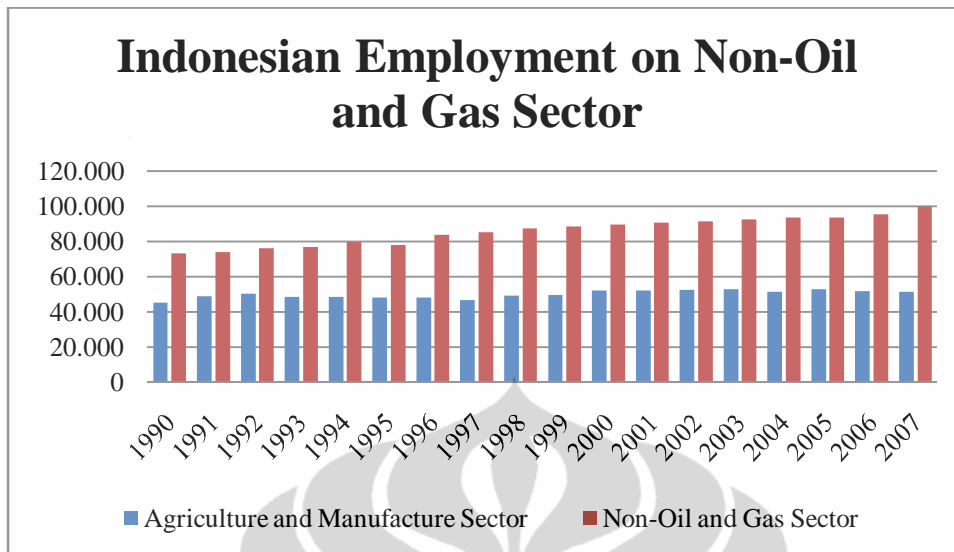
Figure 4.1. Indonesian Employment on Non-Oil and Gas Sector
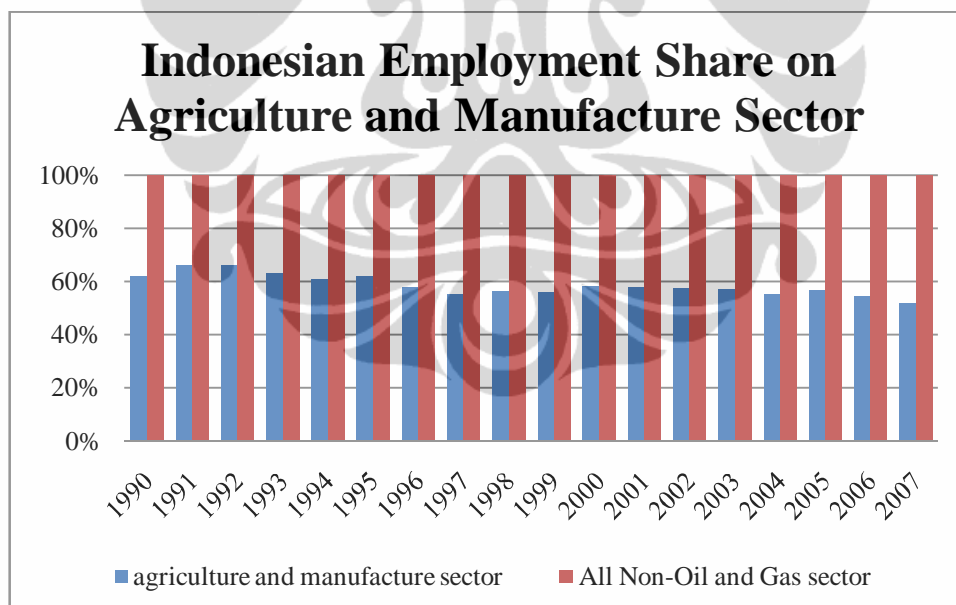
Source: BPS (processed)

Figure 4.2. Indonesian Employment Share on Agriculture and Manufacture

Sector

Source: BPS (processed)

2.   Independent variables are:

    a.   Y and Y_w variable (real GDP and real world GDP)

Real GDP and Real world GDP variable was deflated from the ratio of nominal form. It uses GDP deflator (2000 = 100). The data was used IDR billion standard measurement. The data was accessed from Badan Pusat Statistik (BPS) and International Monetary fund (IMF).

b. K variable (Capital stock)

Capital stock variable is use data from Piere Van Der Eng (2005) that derived for 'Indonesia's new national accounts', bulletin of Indonesian Economic Studies, 41 (2005) No.2, pp.253-62, www.cbe.anu.edu.au. All capital stock data is already in 2000. This data derived as reference market price with IDR billion as a standard measurement.

c. W variable (Wages)

Wages variable is derived from average wage of data. Wages data was accessed from Badan Pusat Statistik (BPS) and Indonesian Ministry of Manpower and Transmigration. This data use thousand rupiahs as standard measurement.

d. X and M variable (exports and Imports)

Export and import variable are refer to non oil and gas classification that BPS standard measurement. These data which are USD million as standard measurement are taken from BPS. The data has transformed from nominal into real form.

e. E variable (Exchange rates)

Exchange rates variable is taken from International Fund Statistic (IFS), with IDR per USD as a standard measurement.

4.4. Methodology

This study is using ordinary least square (OLS) multiple regression method with dummy variable (1997-1998) crisis. This method is used to analyze and prove the quantitatively impact of variables such as export and import (trade), capital stock, real GDP, wages and economic crisis on employment in Indonesia. It also analyzes the impact of variable real GDP world and exchange rates on export and import in Indonesia.

This study differs from previous study that deals with aggregate level and firm level. This study try to focus in non-oil and gas sector that have manufacture, agriculture, mining and services sector which are contributing to employment growth. That's why, this topic is interesting to discuss.

The data is started from 1980, when Indonesia applied export promotion strategy to increasing economic growth and it ended up in 2007 due to the availability of the data. The data will run by using model and simultaneous regression method then it will tested to see signification of model and the data. The test will use; first, F-test and adjusted R-squared, second, t-statistic and probability, third, multicolinearity test, heteroskedasticity test and autocorrelation test.

4.5. Econometric test

4.5.1. F-test and Adjusted R-squared

F-test and adjusted R-squared (R^2) is the tool to test the model for significances of the regression. It is important to knowing how well the relation between independent variable and dependent variable.

Gujarati (2003) said, The F-test measures the regression slope (coefficient) collectively. It estimates the significant of the independent variables on the dependent variable collectively. Meanwhile, coefficient determination (R^2) measures the proportion or percentage of the total variation in Y explained by the regression model. R^2 measure shows us about how well the sample regression line compatible the data. The higher of R^2 value is better of the dependent variable to explain the independent variable with limitation in 0 to 1.

4.5.2. T-test and probability

The model must be tested by T-test statistic to know the significances of the individually variable between independent variable and dependent variable. This test called by partial regression coefficient testing.

A coefficient is said to be statistically significant if the value of the t-test statistic lies in the critical region (null hypothesis is rejected). In the contrary, a coefficient is statistically insignificant if the value of t-test statistic lies in the acceptance region (null hypothesis is not rejected).

4.5.3. Multicollinearity, Heteroskedasticity and Autocorrelation Test

Gujarati (2003) in basic econometric said that Multicollinearity refers to the existanceof linear relationship among some independence variables. High correlation between independent variables indicates problem of multicollinearity exist in the model. The model that have multicollinearity still have BLUE estimator. On contrary, this condition could make high level of variances.

Heteroskedasticity is the condition that the variance of the data from each residual is not constant. This condition can make estimation process inefficient, despite of the estimation still consistent and unbiased. Heteroskedasticity can have impact to t-test and F-test result is useless.

Meanwhile, Autocorrelation is defined that there are having correlation on each variable between one observation to another observation. Autocorrelation can make coefficient estimation still consistent and unbiased, but, the variance could be higher.

4.6.   Research Framework

In this study, research framework will define as follow:
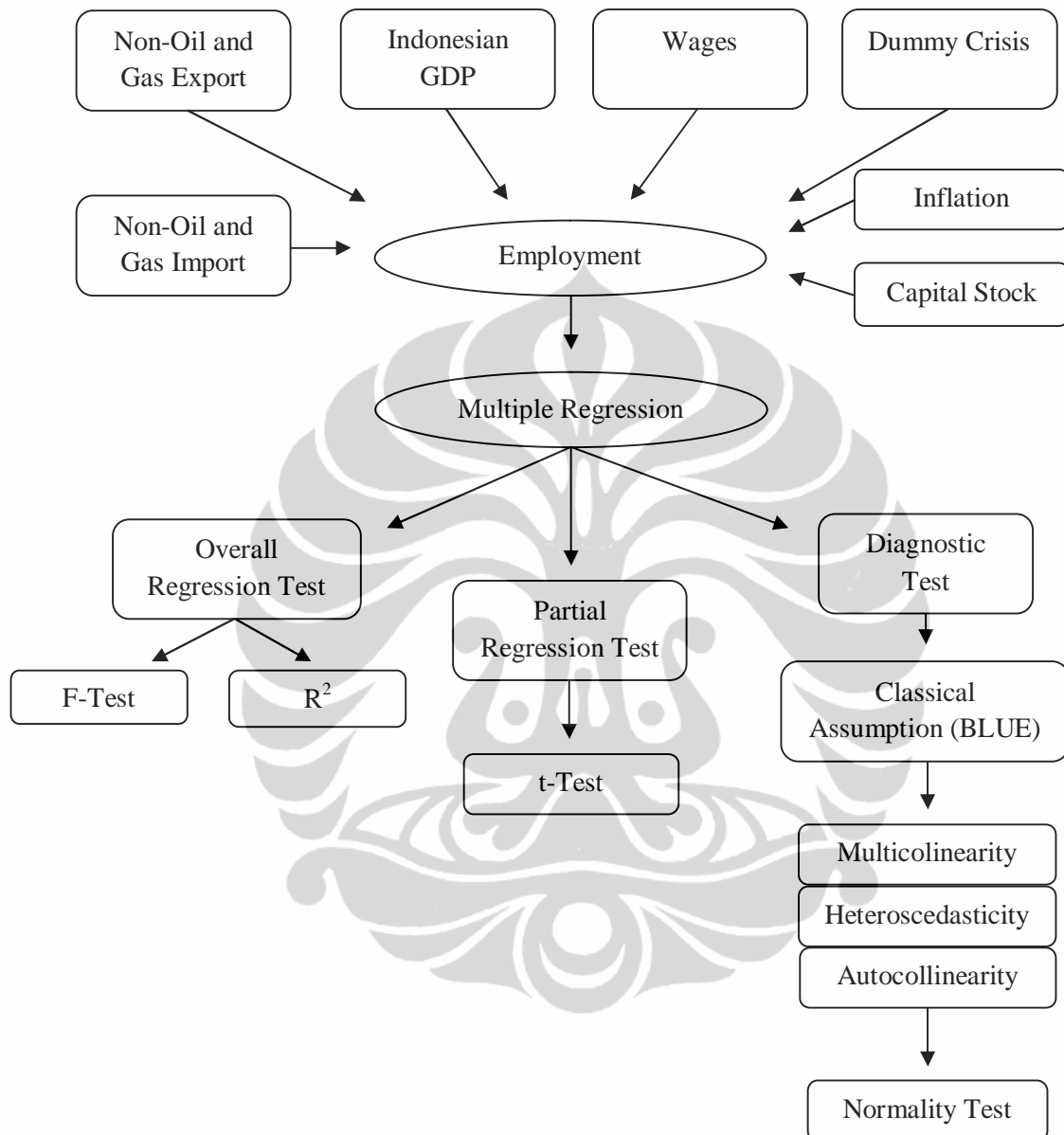
Figure 4.3. Research Framework

Source: the author

The impact of non..., Achmad Sigit Santoso, FE UI, 2010.

Chapter 5
RESULT AND ANALYSIS

5.1.   Statistic Descriptive Analysis

The description of relationship between employment and non-oil and gas export is shown in figure 5.1. The figure shows that there is positive relation between non-oil and gas export and employment.
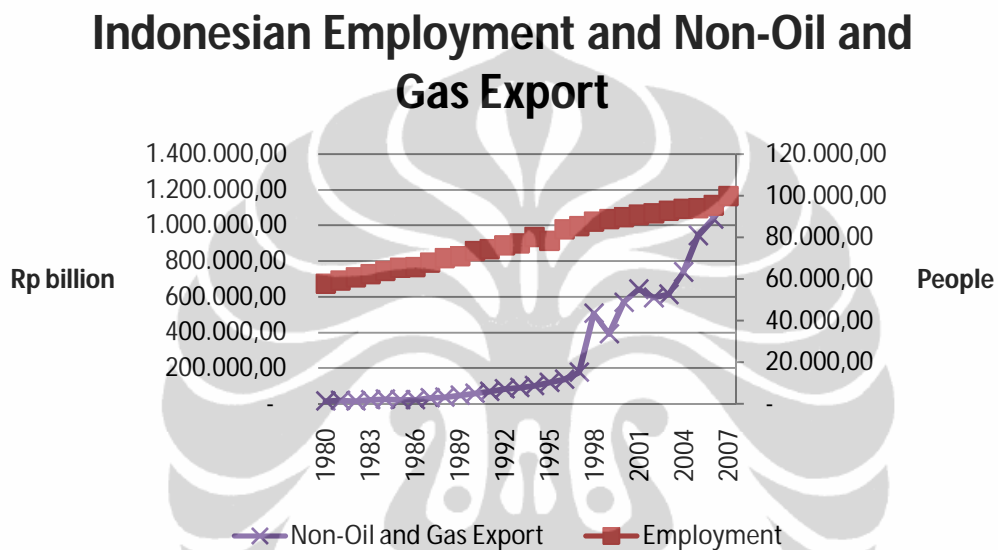
Figure 5.1. Indonesian Employment and Non-Oil and Gas Export

Source: International Financial Statistic and Indonesian Central Statistic Agency

Based on the figure 5.1, the trends of the graph show that non-oil and gas export and employment tends to increase. The highest growth of Non-oil and gas export is happened in 1997-1998. It is caused by the depreciation of Indonesian exchange rate to USD. The depreciation of rupiahs to USD could make the value of Indonesia export will increase. Then this condition could not hold out because the non-oil and gas export go to fall down in 1999. In this year the effect of economic crisis had began. Mean while, the increasing of Indonesian employment is stable, with average of employment growth 21 percent from 1980-2007.

The description of relationship between Indonesian GDP and employment is shown in figure 5.2. The figure shows that there is positive relation between Indonesian GDP and employment.

Figure 5.2. Indonesian GDP and Employment

Source: international financial statistic

The trends of the graph show that Indonesian GDP and employment tends to increase. In period 1980-2007, Indonesian GDP constantly increases, except in 1998 decrease to IDR 802.590 thousand. Or, the growth of Indonesian GDP was minus 40 percent in 1998. This condition caused by economic crisis that hit Indonesian monetary. Then, in 1999, Indonesian GDP was increased again to IDR 928.629 thousands. Or it was increased only 16 percent. Meanwhile, Indonesian employment still consistent increased. As a whole, the increasing of GDP lead tends to increase Indonesian employment creation.

Indonesian GDP

Figure 5.3. Indonesian GDP

Source: Indonesian Central Statistic Agency (processed)

Based on the figure 5.3, every year the number of Indonesia's GDP generally increased. However, in lasts 1997 to 1998 economic crisis hit Indonesia and causing a GDP decline. However, in each year, GDP value also dynamically chases. There are a few years where the value of Indonesia's GDP growth declined. The greatest Decreasing of GDP growth rates occurred in 1998. The growth is -13 percent, this declined make the effect to decline in the value of Indonesia's GDP of USD 1.3 billion.

One of many important variables is the price of the commodity. The Price is dominant factor in the economy as indicators, especially to accommodate the law of demand and supply in the market. The price worker is equal to workers wages or salaries. The amount of wages is a factor determining whether or not someone can receive a job.

The description of relationship between wages and employment is shown in figure 5.4. The figure shows that there is positive relation between wages and employment. In addition, the trends of wages and employment graph tend to increase.

Figure 5.4. Indonesian Wages and Employment

Source: BPS and ministry of Manpower and Transmigration (processed)

According to the Indonesian ministry of labor and transmigration, the composition of the people who work is 27 percent in the formal sector and 72 percent in the informal sector. Therefore, in Indonesia, the wages of workers is relatively cheap. Meanwhile, the wages has a positive sign with employment. This indicates that, any increasing in wages will be followed by increase the amount of employment. This condition is contrary to the theory available, which is increasing of wage, will decrease the number of employment. In other words, the sign of the coefficient symbol of wages variable should be negative. This case can occur due to the level wages in Indonesia is very small number. So, each wage increase does not reduce the amount of employment, precisely it increased the number of employment in Indonesia.

On contrary, Phillips curve theory state that there is trade-off between inflation and unemployment. The trigger of inflation is raising the real wages. On other word, increasing wages will lead to decrease unemployment (employment increase). However, when output increase the wage will tends to increase. The increasing of output will stimulate the firm to hire more labor. Then the creation of employment will happened (Darojah, 2009).

The description of relationship between Indonesian economic crisis and employment is shown in figure 5.5. The figure shows that there is no relation between economic crisis and employment. The economic crisis that hit Indonesia in 1997-1998 did not effect to employment reduction. The employment reduction happened before and after 1997-1998. In 1997-1998, Indonesian employment precisely increases.

Figure 5.5. Indonesian Employment Growth

Source: Indonesia Central Statistic Agency (processed)

The crisis that occurred in 1997-1998 did not give direct effect to the employment in Indonesia, where at that time; the level of employment in Indonesia has decreased. This happened after the crisis that Indonesia hit in 1997-1998. In addition, the effect of economy crisis happened in 1999-2005 by lowering the level of Indonesia employment growth. The amount of this reduction ranges from 0-10 percent. This happens in both formal and informal sector.

This case caused by the economic crisis that hit Indonesia is a monetary crisis, so the crisis is making Indonesian exchange rate to depreciate. These conditions made the price of Indonesian exports will be cheaper in international markets so that Indonesia's exports increased. The increasing exports can be triggers for domestic industry to increase production capacity. The addition of production capacity requires additional labor, which in the end the number of employment in Indonesia increased.

The economic crisis that hit Indonesia in 1997-1998 gives a bad effect on the economy and industries after 1997-1998. The impact is reducing on industry production capacity and low interest and purchasing power of consumer to domestic products. So that, because of decreasing the production capacity for manufacturing firms, the industries had reduced employee. Then, the termination of employment on a large scale was happened.

5.2. Regression Result

The model is estimated by Eviews as a representative tool. The data will use from 1980 to 2007 as annual data it is time series. There are several steps to running the data to get some result. These results will be presented and analyzed. Then, the result will be interpreted to narrative descriptions.

This study estimates the model with some step of regression process. There are testing stages, reducing stage, and running stage. The model is estimated by OLS approach. All test in example; stationary test, heteroskedasticity test, Autocorrelation test, Multicolinierity test have been done, and math (annex 2-6) with the result shows that the OLS model can be used.

The results from the reduction of several variables those are not significant in influencing the employment variables is proceed by using OLS regression. There are non-oil and gas export, GDP, Wages, and dummy crisis variables.

According to result of OLS regression, three variables showed a significant number affect the dependent variables of employment. They are a variable of non-oil and gas export, wages and GDP variables. Non-oil and gas export variable has significance probability of 0.00; with coefficient figures of influence is 0.073. GDP variables affect employment variable for 0.123 with a significant probability of 0.00. In addition, the wage variable has 0.0450 of probability rate of significant. The coefficient of variable has 0.038. Meanwhile, the crisis dummy variable has high enough a value of probability. This dummy variable has a number of significance 0.57 and the coefficient 0.007.

This model has a coefficient Durbin-Watson stat greater than its adjusted R^2. Durbin-Watson coefficient shows 1.64 and the number of adjusted R^2 is 0.99.

This condition indicates that the model is not a spurious regression equation. In addition, adjusted R^2 number shows the model have fit composition of variables.

Then, after doing the test heteroscedasticity, this equation models does not have heteroscedasticity that marked large enough numbers of probability 0.85. As well as with the test of Breusch-Godfrey Serial Correlation LM performed to detect the existence of autocorrelation problems. This equation model has also been free from allegations of autocorrelation, which in the probability numbers 0.58. It is all shown in Table 5.5.

Table 5.1. Regressions Result

Dependent Variable: LE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.260864	0.191834	43.06263	0.0000
LEX	0.073178	0.012533	5.838688	0.0000
LGDP	0.123160	0.014643	8.410852	0.0000
LW	0.038270	0.018049	2.120343	0.0450
DC	0.007615	0.013513	0.563537	0.5785
Breusch-Godfrey Serial Correlation LM Test:	Prob. Chi-Square(2)	0.587786	H0 is accepted, there is No Heteroskedasticity	
White Heteroskedasticity Test:	Prob. Chi-Square(7)	0.852683	H0 is accepted, there is No Autocorrelation	

Where:

LE : Log of Employment

LEX : Log of Non-Oil and Gas Export

LGDP : Log of Gross Domestic Product

LW : Log of Wages

DC : Dummy Crisis

These results have parameter that can be estimated, such as:

R-squared : 0.992525

Adjusted R-squared : 0.991225

Durbin-Watson stat   : 1.644641

F-statistic   : 763.4463

Prob(F-statistic)   : 0.000000

Akaike info criterion : -5.325745

Based on the initial draft of the model will be used to estimate the relationship of independent variables of non-oil and gas export, the non-oil and gas imports, capital stock, GDP, wages, inflation, and dummy crisis to the dependent variable which is employment. The model which is used was experiencing some adjustments to the composition of the independent variables. This is because, the test results of the model shows that some variables are not significant relation to the dependent variable. These variables are capital stock, non-oil and gas imports and inflation.

Variable capital stock, non-oil and gas imports, and inflation had problem of multicollinearity. That is why, these variables could not improve the model fitness. With this consideration, some variables are omitted from the composition model. Then the best model is to become:

Log Nt = 8.26 + 0.073 Log Xnog* + 0.123 LogGDP* + 0.038 LogWage** + 0.007 Dcrisis

Note: *   Confident level 1 percent
        **   Confident level 5 percent
        ***   Confident level 10 percent

Based on regression results from models that have been decomposition, three of the four independent variables significantly affect the employment variable on less than 5 percent level of the confidence. Two variables have 1 percent of confident level and one variable has 5 percent of confident level. While a dummy crisis variable does not have the significance affect to employment variables.

Variable non-oil and gas exports significantly affect employment variable. Coefficient value of non-oil export variable is 0.073, its means, if non-oil exports increased by 1 percent, the employment could increase as much as 0.073 percent.

It can be said that the growth rate of employment which is the impact of increased non-oil and gas exports is inelastic in Indonesia. Non-oil and gas export relatively smaller in contributing to in the number of employment.

GDP variable has a high significance value of the variable employment. Probability of significance of the GDP variable is 0.00 and coefficient is 0.123. This indicates that the influence of increasing the value of Indonesia's GDP large enough increase the number of employment. However, the values of an increasing number of employments are still relatively smaller compared to the increasing of GDP value. 1 percent increase in the value of Indonesia's GDP will contribute to an increase in the number of employment of 0.123 percent. This number still had inelastic coefficient. This value is greater than the contribution of Indonesian non-oil and gas exports.

Based on the result, the wage is still a dominant factor to influence the level of employment in Indonesia. It can be seen in the number of probability, which links the probability rate of wages with employment showed 0.045. It means that the wage variables are significantly affecting to dependent variables, in this case employment. This proves that wages are not factors that can affect the employment in Indonesia. This variable also has coefficient 0.038. It means that the employment creation will increase 0.038 percent if the wages has increase 1 percent. The wages is the inelastic variable that can influence the employment variable.

The regression result shows that Crisis dummy variable be a one of the variables that not affect the employment in Indonesia. On the other hand, this variable has number of significant probability 0.578. This condition gives the sense that economic crisis did not influence directly to employment in Indonesia.

Chapter 6

CONCLUSION AND RECOMMENDATION

6.1. Conclusions

This study tries to analyze relationships between non-oil and gas exports and employment. Other supporting variables are also included such as GDP, wages, and the dummy economic crisis. The data used in this research is secondary data with a range of time from 1980 to 2007. The study found some results, namely:

a) The factors that influence the employment creation in Indonesia are non-oil and gas export, GDP, and wages.

b) These factors had inelastic coefficient of variables. The change of those factors just makes a few changes on employment creation in Indonesia.

c) The economic crisis factor in 1997-1998 does not influence the employment creation in Indonesia.

6.2. Recommendation

The relationships between non-oil and gas exports, GDP, and the wages have an impact on employment creation in Indonesia. These factors contribute to job creation, although only slightly. However, this contribution issues not only lies in how much the government could trigger to increase these variables in an effort to expand and create new jobs. But the government also thought how to improve the value of elasticity of factors. Because by improving the elasticity of these factors, it can also increase the multiplier effect for the industry in country. Thus the new job would be more created.

In non-oil and gas sector, if the government wants growth in the number of workers is high in Indonesia, the government had to push the non-oil and gas export growth even further. Such as, government can publish the policy that can improve the quality and quantity of non-oil and gas exports. Because of the increasing quality of the product will open the market for Indonesia to compete in international market. Then, increasing volume of export commodity can increase the employment creation.

In GDP sector, government should improve the value of GDP for example; with increasing the foreign and domestic direct investment. This method will create new job for domestic population. In addition, government can increase their expenditure with develop infrastructure. It can make increasing the multiplier effect to develop investment and job creation.

The Government should review the labor regulations in Indonesia, because the regulation creates sticky wage. The improvement of labor regulation can provide investors the flexibility of investment in Indonesia.

Finally, this study has recommendates important point for future study. It is important to find out the specific data for employment. Such as the data that is approached by the employment in agriculture and manufacturing sector.
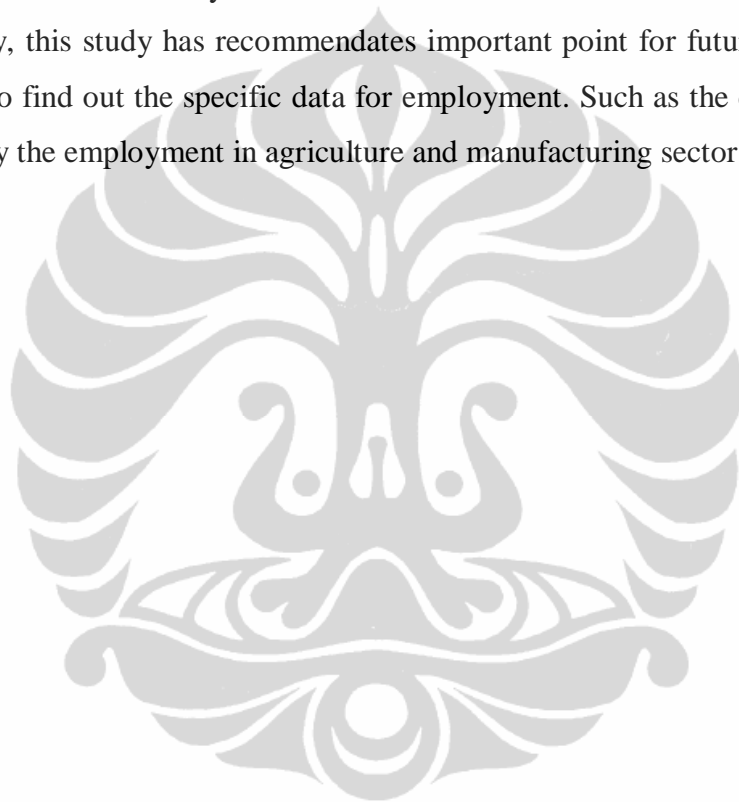
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Dependent Variable: LOG(E)
Method: Least Squares
Date: 01/11/10   Time: 22:32
Sample: 1980 2007
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.260864	0.191834	43.06263	0.0000
LOG(EX)	0.073178	0.012533	5.838688	0.0000
LOG(GDPEX)	0.123160	0.014643	8.410852	0.0000
LOG(W)	0.038270	0.018049	2.120343	0.0450
DC	0.007615	0.013513	0.563537	0.5785

R-squared	0.992525	Mean dependent var	11.25678
Adjusted R-squared	0.991225	S.D. dependent var	0.166273
S.E. of regression	0.015576	Akaike info criterion	-5.325745
Sum squared resid	0.005580	Schwarz criterion	-5.087851
Log likelihood	79.56043	F-statistic	763.4463
Durbin-Watson stat	1.644641	Prob(F-statistic)	0.000000

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.414268	Prob. F(2,21)	0.666107
Obs*R-squared	1.062785	Prob. Chi-Square(2)	0.587786

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/11/10   Time: 23:17
Sample: 1980 2007
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003687	0.197275	0.018688	0.9853
LOG(EX)	-0.001961	0.013056	-0.150158	0.8821
LOG(GDPEX)	-0.001559	0.015153	-0.102870	0.9190
LOG(W)	0.003373	0.018900	0.178479	0.8601
DC	-0.000346	0.013876	-0.024904	0.9804
RESID(-1)	0.051454	0.238265	0.215955	0.8311
RESID(-2)	0.211147	0.244101	0.864996	0.3968

R-squared	0.037957	Mean dependent var	1.11E-15
Adjusted R-squared	-0.236913	S.D. dependent var	0.014376
S.E. of regression	0.015988	Akaike info criterion	-5.221584
Sum squared resid	0.005368	Schwarz criterion	-4.888533
Log likelihood	80.10217	F-statistic	0.138089
Durbin-Watson stat	1.795985	Prob(F-statistic)	0.989520

White Heteroskedasticity Test:

F-statistic	0.385929	Prob. F(7,20)	0.899680
Obs*R-squared	3.332030	Prob. Chi-Square(7)	0.852683

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/11/10   Time: 23:16
Sample: 1980 2007
Included observations: 28
Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.042407	0.464093	-0.091376	0.9281
LOG(EX)	-1.94E-05	0.007840	-0.002476	0.9980
(LOG(EX))^2	-6.28E-06	0.000346	-0.018136	0.9857
LOG(GDPEX)	0.010629	0.070429	0.150920	0.8816
(LOG(GDPEX))^2	-0.000346	0.002515	-0.137576	0.8920
LOG(W)	-0.006215	0.007331	-0.847728	0.4066
(LOG(W))^2	0.000260	0.000322	0.805664	0.4299
DC	0.000138	0.000462	0.297639	0.7690

R-squared	0.119001	Mean dependent var	0.000199
Adjusted R-squared	-0.189349	S.D. dependent var	0.000392
S.E. of regression	0.000427	Akaike info criterion	-12.44443
Sum squared resid	3.65E-06	Schwarz criterion	-12.06380
Log likelihood	182.2220	F-statistic	0.385929
Durbin-Watson stat	2.260693	Prob(F-statistic)	0.899680

	EX	GDPEX	W
EX	1.000000	0.045384	0.980969
GDPEX	0.045384	1.000000	0.143354
W	0.980969	0.143354	1.000000

ANNEX 5 Stationery Test Result before reduction form

	Autocorrelation	Partial Correlation	Q-Stat	rob
Sample: 1980 - 2007				
Included observations: 28				
1	0.903	0.903	25.394	0.00
2	0.811	-0.026	46.663	0.00
3	0.708	-0.113	63.497	0.00
4	0.611	-0.028	76.554	0.00
5	0.517	-0.035	86.331	0.00
6	0.416	-0.106	92.955	0.00
7	0.3	-0.16	96.564	0.00
8	0.189	-0.062	98.062	0.00
9	0.087	-0.029	98.398	0.00
10	-0.027	-0.174	98.433	0.00
11	-0.102	0.102	98.947	0.00
12	-0.171	-0.019	100.47	0.00

ANNEX 6 Multicollinearity Test Result before reduction form

	EX	IM	GDP	CS	I	W
EX	1.000000	0.997374	0.870519	0.667844	-0.013646	0.980969
IM	0.997374	1.000000	0.878208	0.690401	0.003444	0.979674
GDP	0.870519	0.878208	1.000000	0.934996	0.100705	0.902642
CS	0.667844	0.690401	0.934996	1.000000	0.246329	0.714611
I	-0.013646	0.003444	0.100705	0.246329	1.000000	-0.061216
W	0.980969	0.979674	0.902642	0.714611	-0.061216	1.000000
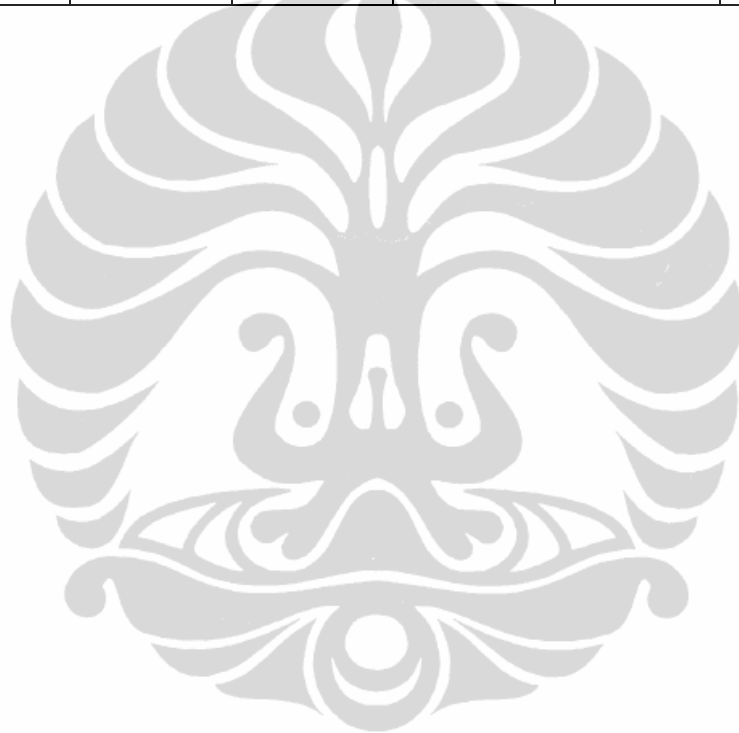
ANNEX 7 Stationery Test Result on First Difference Form

	Autocorrelation	Partial Correlation	Q-Stat	Prob
Sample: 1980 – 2007				
Included observations: 27				
1	-0.114	-0.114	0.3916	0.531
2	0.196	0.186	1.5965	0.45
3	0.131	0.178	2.1522	0.541
4	-0.026	-0.032	2.1758	0.703
5	-0.001	-0.075	2.1758	0.824
6	0.075	0.06	2.3863	0.881
7	0.27	0.341	5.2497	0.63
8	0.006	0.075	5.2513	0.73
9	0.106	-0.061	5.739	0.766
10	-0.04	-0.174	5.8144	0.831
11	-0.055	-0.074	5.9618	0.876
12	-0.083	-0.031	6.3206	0.899