THE ECONOMIC GROWTH AND THE REGIONAL CHARACTERISTICS : THE CASE OF INDONESIA

Yesi Hendriani Supartoyo[1]
Jen Tatuh
Recky H. E. Sendouw

Abstract

This paper analyzed the regional characteristic and the output growth. Using panel data analysis on 33 provinces in Indonesia, the result shows that the labor growth and net export positively affect the output growth. Surprisingly, the inflation and human capital were found to be insignificant on output growth.

Keyword : economic growth, panel data, regional characteristics
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1   Yesi is a postgraduate student on Program Studi Ilmu Perencanaan Pembangunan Wilayah dan Perdesaan (PWD), Sekolah Pascasarjana Institut Pertanian Bogor; yesisupartoyo@mail.com.

I. INTRODUCTION

Development is a process towards continuous change striving to improve the welfare of the community. One indicator of the successful implementation of development that can be used as a measure of economic growth at the macro level is reflected in the changes in Gross Domestic Product (GDP) in the region. A higher the economic growth of a region indicates a better economic activity as obtained from the GDP growth rate at constant prices (Todaro and Smith, 2008).

The quality of economic growth in Indonesia is still low. Although economic growth in Indonesia is quite high, effect is very low in society, where for every 1 percent of Indonesia's economic growth is absorbs only 250 thousand of new workers (Adi, 2011).

Indonesia's economic growth is quite high but the effect on its people is low and raises questions about the influence of the regional characteristics on economic growth. The research of Sodik et al (2007) stated that the overall pattern of a region's capacity is a result of the nature of social and economic environment that determines the pattern of activity in achieving objectives reflected in regional characteristics which influence economic growth in the form of aspects or qualities consisting of regional labor force, population, human capital (education), inflation and net exports.

Employment is a very important aspect to be studied. Countries with a very large number of people and the provision of limited employment opportunities face serious problems with unemployment. Developments in the labor force cannot be separated from the rate of population growth in the region. Tjiptoherijanto (2001) stated that during the period 1997-1999, the total work force in Indonesia tended to increase, either in working or looking for work. When viewed between the number of people working and those looking for work, it turned out the working population was relatively larger than those looking for work, but the increase was much higher for those in the population who are looking for work. In the construction, local residents often serve as a source of labor which addresses the problem of employment. Thus with a population increase in Indonesia from year to year, while the number of jobs available can lead to limited competition, job seekers are threatened by the lack of opportunity and fulfillment of well-being by fear of increased poverty. As revealed by Ngangi (2010), overcoming poverty is not an easy task but it is closely related to life issues such as the state of the environment, a social activity, education level and health status. The quality of labor is reflected in part by the improvement of education. The higher the formal education obtained, the labor productivity tended to be higher as well. This is consistent with the theory of human capital (human capital)

Sendouw (2006) stated that as a country, Indonesia is one country that has the greatest natural resources in the world, but it has not guaranteed improved welfare of its society. Nor is the use of its resources dependent on the age of the country, but reflected in the attitudes and behavior follow the principle - the basic principle of life. Attitudes and behaviors exhibited

by human beings can be formed through a process of learning, especially in formal education, thus human capital follows the basic principles of life.

The phenomenon of inflation in Indonesia has become one of the various "diseases" of the government macroeconomic which is especially troubling for the community. Towards the end of the New Order regime (before the financial crisis) the annual inflation rate could be reduced to the single digits, but in general it still contained vulnerability when seen from the large percentage of poor communities suffering from inflation.

Since 1967, Indonesia tried to open up. Changing from an isolated system to an open system contains a dubious advantage. Indonesian net export value fluctuated over 2 decades and during the period from 2005 to 2010, Indonesia's trade balance (net exports) experienced a trade surplus. Based on a review of several indicators of regional characteristics, the required study group should have similar characteristics as the region in order to gain an overall understanding of the factors that can be determined and identified through the analysis which presumably can spur economic growth in establishing a region.

This paper attempts to analyze the influence of the labor force growth rate, population growth rate, the growth rate of human capital, the growth rate of inflation, and the rate of growth of net exports to economic growth in Indonesia. This research is expected to contribute to decision-makers in providing information on the factors that affect the economic growth of a region as well as to the field of economics, especially on regional economic growth and development.

The second part of this paper reviews the theory and literature, while the third section outlines the methodology and data used. The fourth section presents the estimation results and analysis and the conclusions and recommendations are presented in the last section.

II. THEORY

Economic growth measures the achievement of the development of an economy. Measurement of the progress of an economy requires precise measuring instruments, such as gauges of economic growth. The Gross Domestic Product (GDP) is such a measure, where at the regional level it is called the Gross Domestic Regional Product (GDP) which measures the amount of goods or services produced by an economy in the run period of one year and expressed in market prices.

According to classical economics, Smith, economic growth is influenced by two main factors, namely total output growth and population growth. Economic growth is strongly influenced by the productivity of sectors in the use of production factors. Productivity can be improved through a variety of means of education, training and better management (Sukirno, 2008) .

According to traditional neoclassical growth theory, output growth is always sourced from one or more of three factors, namely the increase in the quality and quantity of labor, capital increase (savings and investment) and technological improvements (Todaro and Smith, 2008).

Mankiw, Romer and Weil (MRW) modified the neoclassical growth model in which they proposed the use of a variable accumulation of human capital (human capital). Thus a source of economic growth comes from the growth of capital, labor and human capital. Estimation results generated from the MRW model turned out better than the neo-classical models (Mankiw, 2006).

The new growth theory provides a theoretical framework for analyzing endogenous growth. Economic growth is a result of the economic system. Technological progress is endogenous, growth is part of the actors' decisions to invest in the knowledge economy. The role of capital is greater than just a part of growing revenues if capital is not only physical capital but human capital concerns. The accumulation of capital is the main source of economic growth (Mankiw, 2006).

The rate of growth of population and matters related to the increase in total labor force (labor force) has traditionally been regarded as a positive factor in stimulating economic growth. A positive relationship is true where it depends on the ability of the economic system to absorb and productively employ additional workers. Neoclassical theory states that labor is one factor that explains the high and low economic growth. Sodik et al (2007) in his study tried to examine the effect of agglomeration on regional economic growth. The results indicated that regional economic growth is influenced by the labor force. Solow theory (Neo Classic) also stated that the rate of growth of the labor force and a significant positive effect on economic growth, caused by the increasing number of labor force that works, has the ability to produce a higher output. With so much capable output generated, it will push the level of aggregate supply to drive economic growth.

In general, the population growth rate is considered as one of the positive factors that spurs economic growth. However, the role of the rate of population growth on economic development depends entirely on the ability of the economic system to absorb and productively utilize additional labor. The ability itself is further influenced by the type of capital accumulation and availability of inputs or contributing factors such as managerial and administrative skills.

In addition to the total population, the role of labor to GDP growth is also highly dependent on the quality of the workforce. Human Capital Theory explains that a person can increase their income through higher education. In addition to delaying receipt of income, people who continue their education have to pay the cost of continuing education directly. After graduating, there is the expectation of work with a higher income, which can lead to economic growth in the region. The higher the educational level of a population in a region, the greater the positive influence for economic growth. The growth rate of human capital is seen as a major

growth engine that has a role to mobilize and encourage economic growth. The Solow theory states that the rate of growth of human capital has a positive effect on economic growth. This is because human capital is a key input for the basic research of new products or ideas. Thus, countries with a higher initial stock of human capital tend to have economies that grow faster. Thus realizing human capital is an important source of growth in endogenous growth theory. Human capital refers to the stock of knowledge and production skills of a person. Education is one of the ways in which individuals increase their human capital. Arguments supporting this theory state that people with have higher levels of education, as measured by their length of time in school, will have a work with a better wage than those people with lower education. If wages reflect productivity, then the more people who have a higher education, the higher the productivity which would result in a higher level of growth for the national economy. With a population higher one's education, human capital stock is expected to be higher. Human capital has a positive relationship with economic growth implication,and education has a positive relationship with productivity or economic growth.

Export -oriented economy can be understood through export-led growth supported by economic and trade policies to speed up the industrialization process of a State by exporting goods that have a comparative advantage. Export-led growth opens up the domestic market to foreign competition in exchange for market access in other countries. Export-led growth is an economic strategy that is used by some developing countries. This strategy seeks to find a niche in the world economy for the export of certain types of goods. Industries producing export goods can receive government subsidies and better access to local markets. By implementing this strategy, countries hope to gain a stronger currency to import commodities produced cheaper elsewhere. Export-led growth has an important advantage in its ability to generate profits and allow a State to balance their finances, even exceed their debt, as long as the facilities and materials available for export. In addition, a much more important advantage which is debatable is that export growth can lead to greater productivity. The importance of this concept is discussed in the model by JSL McCombie and AP Thirwall (1994) in Economic Growth and the Balance - of- Payments Constraint. There are basically two types of exports that are used in this context, manufactured goods and raw materials.

The balance of trade is a term used to describe the difference between the monetary value of exports and imports. The balance of trade reflects net exports. A positive balance of trade means that the country monetary value of exports exceeds its imports – this is commonly called a trade surplus. Conversely, if the balance of trade shows a negative condition, this means the monetary value of imports exceeds exports – this is referred to as a trade deficit. Countries strive to achieve a trade surplus. A trade surplus, where the amount of exports is greater than imports, brings a positive influence on the country's economic growth.

Another factor that influences economic growth is the price level. In the economy, the rising prices in general and associated with processes and mechanisms that occur in the market,

affects the decline in currency values. Inflation actually reflects the stability of a currency which in turn reflects the stability of the price level and affects the realization of achieving the goals of economic development of a country, such as the expansion of employment opportunities and economic stability. Empirically according Sodik et al (2007), regional economic growth is influenced by the rate of inflation. Sodik and Nuryadin (2005) concluded that the rate of inflation has no effect on the growth of the regional economy, although observations over the period 2000-2003 (after decentralization) saw a negative growth effect on the Indonesian economy.

Referring to the above description, the role of the rate of population growth, human capital accumulation, the rate of inflation, and exports to economic growth can be briefly illustrated in the following figure:

III. METHODOLOGY

Data and Variables

This research was conducted using secondary data collected from relevant agencies (BPS North Sulawesi) in Manado City, North Sulawesi. This research was carried out in February 2012 until April 2012.

Types of data used included annual data covering the period 2006-2010 from 33 provinces in Indonesia, including the following variables:

- Growth rate of Gross Domestic Product at constant prices of 2000 by province in Indonesia 2006-2010

- Total Labor Force Population aged 15 years and over by Province in Indonesia 2006-2010

- Total Population Growth by Province in Indonesia in 2006 - 2010

- Number of Students in Public and Private Education under the Ministry of National by Province in Indonesia in 2006-2010

- Inflation Rate by Province in Indonesia in 2006-2010

- Value of Export and Import by Province in Indonesia in 2006 - 2010

Estimation Techniques

This study used panel data regression analysis. The F statistic al test (Chow test) and the Hausman test were used to choose between models of common effects or fixed effects, (Hausman, 2001). The empirical model estimateis:

$$Y_{it} = \alpha_{oi} + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \beta_4 x_{4it} + \beta_5 x_{5it} + \varepsilon_{it} \qquad (1)$$

where Y is the rate of growth PDRB; x_1 is the growth rate of labor force; x_2 is the population growth rate; x_3 is the growth rate of human capital; x_4 is the rate of inflation; and x_5 is the rate of growth of net exports. The notation i and t indicate the identifier (in this province) and time.

IV. RESULT AND ANALYSIS

The research data was tested by using different types of estimate models of common effects with fixed effects models, fixed effects models and random effects models with fixed effect models with weighted least squares. The best results of several tests were used to formulate the conclusions in this study.

From the results of calculation using the common effect model estimation with a fixed effect model, and with the help of software E Views 5.1, the results obtained an equation for economic growth for Indonesia as follows:

Table 1
Common Effects Model Estimation and Fixed Effects Model

Variable	Coeficient	Std. Error	t-Statistic	Prob.
C	8,7143	1,8352	4,7483	0,0000
INFLATION	-0,1518	0,0780	-1,9457	0,0539
WORK	0,0688	0,0298	2,3091	0,0226
EDUCATION	-0,0022	0,0093	-0,2349	0,8147
NET	0,0008	0,0007	1,1520	0,2515
POPULATION	-1,1043	0,9193	-1,2012	0,2319
Cross-section fixed (dummy variables)				
R-squared	0,3874	Mean dependent var		5,7153
Adjusted R-squared	0,2089	S.D. dependent var		3,5803
S.E. of regression	3,1842	Akaike info criterion		5,3531
Sum squared resid	1287,737	Schwarz criterion		6,0684
Log likelihood	-403,637	F-statistic		2,1711
Durbin-Watson stat	2,4586	Prob(F-statistic)		0,0007

Estimation results in Table 1 illustrates that there is one variable that is significant at $\alpha = 5$ percent, which is the rate of growth of the labor force while the growth rate of inflation is significant at $\alpha = 10$ percent. While three other variables are not significant at $\alpha = 5$ percent i.e., human capital (education), net exports and population. From the estimation, R2 generated from the estimated equation in this study is relatively small which only amounted to 38.74 per cent during the period of observation. This may imply that the common effect model analysis method with the fixed effects model, the variation of independent variables in this study were

able to explain only 38.74 percent of the variation of the dependent variable, while the remaining 61.26 percent is explained by other variables not included in the research model.

The Chow test was used to determine the choice of estimation. This test is known to be the more appropriate choice when looking at common effects models with fixed effects model. The null hypothesis is that the model follows the common effect, while the alternative one is fixed effect. Table 2 provide the results.

Table 2 Chow Test			
Effects Test	**Statistic**	**d.f.**	**Prob.**
Cross-section F	2,3828	(32,127)	0,0003
Cross-section Chi-square	77,5923	32	0,0000

These results demonstrated both the F test and chi-square were significant (p-value less than 0.0003 and 0.0000 α = 5 percent) so that Ho was rejected and H1 was accepted, then the fixed effects models to follow. Based on the estimation results, we concluded that a better estimation technique to use in this study is a fixed effects model.

Then tests proceeded with the estimation techniques using random effects models. From the results of the calculations using the estimated fixed effect models with random effects models, with the help of software E Views 5.1 obtained results for Indonesia's economic growth equation is as follows:

Table 3 Estimates of Fixed Effects Model and Random Effects Model				
Variable	**Coeficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	6,5333	0,9214	7,0902	0,0000
INFLATION	-0,1092	0,0737	-1,4805	0,1407
WORK	0,0468	0,0279	1,6719	0,0965
EDUCATION	0,0027	0,0088	0,3118	0,7555
NET	0,0005	0,0006	0,8365	0,4041
POPULATION	-0,0992	0,3564	-0,2784	0,7810
Weighted Statistics				
R-squared	0,0348	Mean dependent var		3,9819
Adjusted R-squared	0,0045	S.D. dependent var		3,2533
S.E. of regression	3,2460	Sum squared resid		1675,341
F-statistic	1,1483	Durbin-Watson stat		1,9370
Prob(F-statistic)	0,3372			

Estimates of the fixed effects model with random effects models, showed that there are no significant variables at $\alpha=5$ percent of the work force but significant at $\alpha=10$ percent. From the estimation, R2 generated from the estimated equation in this study was very small as it only amounted to 3.48 percent during the period of observation. This may imply that the fixed effects model analysis method with random effects models has variations in the independent variables in this study which would explain the 3.48 percent variation in the dependent variable for economic growth in Indonesia, while the remaining 96.52 percent is explained by other variables not included in there search model.

The Hausman test determined the choice of estimation to be used. This test determines the more appropriate choice between fixed effect models and random effects models. The Hausman test results indicated that for the observation period 2006 – 2010, test results are significant (p-value 0.0471 is less than $\alpha = 5$ per cent) so that Ho is refused and the H1 is accepted that estimates for the fixed effects model approach is better than the random effects model approach. This also means there is a difference between units that can be seen through the differences in terms the Constants. Fixed effects model is assumed to only focus on a specific individual effect.

Tests performed using the Hausman test as the null hypothesis showed that the model follows the random effects model follow by the fixed effects alternative. The results showed that the more appropriate the model is the Fixed Effects Model (p=0.0471).

In a study using cross sectional data, allowing the presence of heteroskedasticity, the tendency in the research data showed that the estimation technique should be conducted using a fixed effects model with weighted least squares or often referred to as the general least square (GLS).

Based on the results of the processed data for Indonesia's economic growth equation estimation with the fixed effects model weighted least squares (GLS), obtained better results. The estimation results of the model illustrated that there were two significant variables at $\alpha = 5$ percent, which is the rate of labor force growth and net exports. The estimated model also illustrates that there are 18 provinces that positive economic growth.

The fixed effects model with weighted least squares has different intercepts. In other words, the intercept may be different for each individual. Thought is the basis for the formation of thought fixed effect model. The advantages of this model are its ability to distinguish the individual effects Square (GLS).

Based on the results of the processed data for Indonesia's economic growth estimation equation with fixed effects model obtained better results with weighted least squares (GLS). The estimation results of the model illustrated that two variables were significant at $\alpha = 5$ percent, namely the rate of labor force growth and net exports. The estimated model also illustrated that there are 18 provinces that have positive economic growth.

Table 4 — Model Fixed Effects with Weighted Least Square				
Variable	**Coeficient**	**Std.Error**	**t-Statistic**	**Prob.**
C	5,7478	0,5775	9,9515	0,0000
INFLATION	-0,0173	0,0176	-0,9818	0,3280
WORK	0,0431	0,0117	3,6633	0,0004
EDUCATION	0,0012	0,0018	0,6726	0,5024
NET	0,0003	0,0001	2,8297	0,0054
POPULATION	-0,0207	0,3048	-0,0680	0,9458
Weighted Statistics				
R-squared	0,8292	Mean dependent var		20,6755
Adjusted R-squared	0,7795	S.D. dependent var		16,6059
S.E. of regression	2,5174	Sum squared resid		804,8951
F-statistic	16,6710	Durbin-Watson stat		2,8283
Prob (F-statistic)	0,0000			

In the fixed effects model with weighted least squares the intercept is different. In other words, the intercept may be different for each individual. This is thought to be the basis for the formation of fixed effects model. The advantages of this model is ability to distinguish individual effects.

Table 5 — Model Estimation Results				
Dependent Variable : Y				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	5,7478	0,6289	9,1384	0,0000**
INFLATION	-0,0173	0,0298	-0,5797	0,3280
WORK	0,0431	0,0169	2,5518	0,0004*
EDUCATION	0,0012	0,0017	0,6840	0,5024
NET	0,0003	0,0001	2,3490	0,0054*
POPULATION	-0,0207	0,3142	-0,0660	0,9458
R-squared	0,8292	F-statistic		16,6710
Adjusted R-squared	0,7795	Prob (F-statistic)		0,0000**

Source : processed.
Note : ** = significant at α = 1 percent; TS = Not Significant; * = significant at α = 5 percent

R^2 is the value of 82.92 means that 82.92 percent of the economic growth variables can be explained by the variables growth rate of inflation, labor force, human capital, net exports, and population. While the remaining 17.08 per cent could be explained by other variables outside the model.

F is the F statistic in E Views count. If the p-value is less than α then the hypothesis is rejected (significantly different fromzero). From the test results of the Prob F-statistic obtained that the Prob F-value is statistically significant at $\alpha=1$ percent, indicating that overall, all independent variables were able to explain the dependent variable economic growth.

Discussion

The economic interpretation of the obtained equation at a constant value of 5.75 indicates that if the independent variables are considered constant, then the average Indonesian economic growth was at 5.75 percent.

a. Effect of Labor Force Growth Rate on Economic Growth

Estimates of panel regression data showed that the positive growth rate of the labor force variable had a significant impact on economic growth in Indonesia in 2006-2010. Where the coefficient of the variable growth rate of the labor force (AK) was 0.0431, then the growth rate of the labor force had a significant positive effect on the growth of the Indonesian economy. If the AK growth rate rose 1 percent, then the Indonesian economy grew by 0.0431 percent. This gives a signal that the contribution of the labor force in Indonesia is significant for Indonesia's economic growth. This is consistent with the research hypothesis formulated previously and in accordance to the research conducted by Sodik et al (2007). It is also in accordance with the (neo- classical) theory of Solow which states that the rate of growth of the labor force has a significant positive effect on economic growth, which is caused by the increasing number of people able to enter the labor force, thereby increasing the ability to produce a higher output. With so many people capable of generating output, it will push the level of aggregate supply that will drive economic growth. The significant influence of the labor force to economic growth is mainly caused by the position of the labor force as a factor of production that drives the economy in the region.

b. Effect of Population Growth on Economic Growth

Estimates of panel regression data showed that the population growth rate variable is negative and not significant to the economic growth in Indonesia in 2006-2010. Where the coefficient of the variable population growth rate is - 0.0207 and this value is negative, the population growth rate tends to negatively affect economic growth in Indonesia which is not significant. The results obtained according to the research conducted by Simamora and Sirojuzilam (2008) showed that the population growth rate has no significant effect on regional economic growth. No significant influence on the population growth rate is due, among other things, to low quality of human capital of the labor force during economic activity. Large populations with low population quality causes the population to burden economic growth and not encourage it. According to the theories, economic growth is determined by the population growth rate. The population growth rate factor does not always give a positive contribution to economic growth.

c. Effect of Growth Rate of Human Capital to Economic Growth

Estimates of panel regression data showed that when the coefficient of the human capital growth rate variable is 0.0012, then the growth rate of human capital tends to have a positive effect on economic growth in Indonesia which is not significant. The Solow theory states that the growth rate of human capital has a positive effect on economic growth. Human capital refers to the stock of knowledge and skills to produce one output. Education is one of the ways in which individuals increase their human capital. The higher one's education, the human capital stock is expected to be higher. The results obtained according to research conducted by Gama (2007) showed that estimates of the level of education was not significant. These results are also in line with research conducted Bhinadi (2003) which states that the growth rate of human capital to economic growth is not significant. Sodik et al (2007) also conducted a study on the data estimation which showed that variable levels of education did not have a significant effect on economic growth. Sugiarto (2011) in his study stated that the growth rate of human capital has a positive effect on economic growth in Indonesia but not statistically significant so that it can be stated that the growth rate of human capital does not significantly affect Indonesia's economic growth. Insignificant influence of the growth rate of human capital on economic growth is partly due to the disuse of the lag number of students who are studying in college. This indicates the number of students who have not graduated from college studies lack the proper variables to describe the human capital theory.

d. Effect of Growth Rate of Inflation on Economic Growth

Estimates of panel regression data showed that when the growth rate variable is negative and not significant, inflation prevailed on economic growth in Indonesia in 2006-2010. Where the variable coefficients of the inflation growth rate was -0.0173 and this value was negative, then the growth rate of inflation tended to negatively affect economic growth in Indonesia which was not significant. The results obtained according to research conducted by Sodik and Nuryadin (2005) showed the inflation rate variable with a negative sign has no effect on the growth of the regional economy. The insignificant influence of the growth rate of inflation on economic growth is partly due to inflation (demand pull) at a reasonable rate showed signs of increased revenue. So, since it is not hyperinflation it can be eroded until it there is no growth.

e. Effect of Growth Rate of Net Exports on Economic Growth

Estimates of panel regression data showed that when the rate of growth of the net exports variable were positive, it had a significant impact on economic growth in Indonesia in 2006-2010. When the variable coefficient of the net export growth rate was 0.0003 and this value is positive, then the rate of growth of net exports had asignificant positive influence on Indonesian economic growth. If the rate of growth of net exports rose 1 percent, the Indonesian economy grew by 0.0003 percent. This result is consistent with research conducted by Sodik and Nuryadin (2006) in which the net exports variable was a proxy of openness of the regional economy and its direction is consistent with the hypothesis and theory although it has a relatively

small coefficient. The value of the regression coefficient is small due to the difference of the value of exports which is not too big compared to the value of imports by Indonesia during the study period. That is to say that the level of net exports to one region plays a role in enhancing regional economic growth, although it is not so large role.

V. CONCLUSION

The growth rate of the labor force has a significant positive effect on economic growth so that there is a need to improve the quality of the labor force. Where the population growth rate has no significant negative effect, the need to improve the quality of the population in economic activities was offset by the quantity of the population. Where the growth rate of human capital does not have a significant positive effect on the economic growth, it is necessary to pay attention to the human capital as referred to the use of the lag number of students who are studying in college. Where the growth rate of inflation does not have significant negative effect caused partly because inflation, is at a reasonable stage so as not to erode economic growth, but the government still needs to be able to keep inflation under control. The rate of growth of net exports has a significant positive effect on economic growth so that the government must be able to maintain the pace of net exports in order to keep the surplus.

The above conclusion has several consequences, first it is necessary to have a superior quality workforce that is skilled and reliable, which can be offset by the quantity of the Indonesian population. Secondly, the need to consider human capital refers to the use of the lag number of students who are studying in universities. Thirdly, the inflation rate needs to be anticipated with the importance of maintaining the rate of net exports in order to keep the surplus.

This study has several limitations including a period of relatively short observation period (2006-2010). Secondly, due to the limited time period, the implementation of the human capital theory with the use of a lag in seeing the education productivity of a number student graduates could not be done. It was not possible given the assumption of the future graduating stratum 1 takes 4 years.

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