

# Determinants of Poverty: Panel Data Analysis in Asean-5; 1990 – 2013

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**Abstract:** Poverty is a multi-faceted phenomenon which affects not only the ability to purchase goods, but also vulnerability towards various pressures that may prohibit an individual from enjoying life. This vulnerability may be gauged from living conditions such as employment, health, education, and housing. In short term, poverty can be concluded as one problem that really bothers every country around the world. Poverty is one of the issues being debated in the central and local governments in various regions including in ASEAN region. Since its establishment in 1967, ASEAN has been transforming in from five developing countries to a group consisting of 10 countries that are accounted in the international area. But still, they face the poverty problem up till now.

That's why the analysis of determinants of poverty is essential for preparing strategies towards efficient intervention. This research aims to investigate the determinants of poverty in ASEAN-5. Indonesia, Thailand, Malaysia, Laos, and Vietnam are used as the object since the poverty rate in those five countries can be categorized as high since long time ago, and also the availability data of each country. Because for the rest of ASEAN countries, especially Myanmar and Cambodia, we still face lack of data that are publish freely in the internet. The variables used in this research consist of macroeconomics variables, such as inflation rate, the growth of gross domestic product, unemployment rate, and also social variables, such as total population and youth literacy rate. These variables are considered as the important factors that every country should have. And along with its development, ASEAN countries also have various condition about those factors. Also, it can be said that for some factors, there are some gap between the ASEAN countries.

Data used in this research is obtained from the World Bank Publication. The method used in this research is a quantitative method. By using panel data analysis and STATA 11 as the software, it is seen that generally, factors determine poverty rate in ASEAN-5 are the growth of GDP, inflation rate, unemployment rate, and youth illiteracy rate. Panel data or longitudinal data typically refer to data containing time series observations of a number of individuals. This research use the combination of time series and cross section, that's why we can use the panel data analysis.

Future studies are still needed as a development of this study. We recommend to adding another factor that might be influence poverty, and if it is possible, to use all the ASEAN countries so that we can get broader depiction about the ASEAN countries.

**Keywords:** ASEAN, Illiteracy, Macroeconomics, Panel Data, Poverty Rate

## Introduction

National development is one of the efforts to create a just, prosperous, competitive, advanced and prosperous society. Different development activities have been carried out by each government in every countries, especially in developing countries, that are still lagging behind other regions to generalize the development in various areas. The main indicators of a success development is the reduction in the number poor people. Effectiveness in decreasing the number of poor is the main growth in choosing a strategy or instrument development. This means that one of the main criteria for the selection of gravity or sector the leading sectors of national development are effective in decreasing the number of poor.

Poverty is one of the issues that being debated in the central and local governments in various regions, including in ASEAN region. It prevents the growth rate and other development constructions that are caused by cultural, social, political, economic, education factors and others. Hunger, malnutrition, disease, shelter, illiteracy and other poverty related concerns are challenges that most development area, including ASEAN seek to address. Some highlight condition in ASEAN countries can be seen in figure 1 below:

**Figure 1. Condition in ASEAN**

Country	Total fertility Rate (ca. 2010)	Unmet need for family planning, % (ca. 2007)	Gross national income per capita, US\$ (ca. 2010)	Poverty Incidence, % (ca. 2010)
Philippines	3.3	22.3	2,060	26.5
Thailand	1.6	3.1	4,150	7.8
Indonesia	2.1	8.8	2,500	12.5
Malaysia	2.6	-	7,760	3.8
Vietnam	1.8	4.8	1,160	14.5
Cambodia	2.6	25.1	750	30.1
Lao PDR	2.7	27.0	1,040	27.6
Myanmar	2.0	19.1	-	25.6

Source: ADB, Basic Statistics 2012 (April 2012).

From Figure 1 above, we can see that poverty still becomes the main problem in almost ASEAN countries. Although some ASEAN countries have low poverty rate, others have high poverty rate. There is quite huge gap among ASEAN countries. It is important to know what factors influence the poverty rate in ASEAN countries. There are many factors that influence poverty rate in a country or area. This research used macroeconomic factors, such as the growth of GDP, inflation rate and unemployment rate to see the impact of those factors in poverty rate in 5 ASEAN countries. Meanwhile, researcher also use the social factors that are believed have impact to the poverty rate. They are the total population and also education level, that is measured by the youth literacy rate. It is because poverty is a multidimensional thing that has affect to almost every aspect in a country.

Based on the background and formulation of research problems above, the objectives of this study are as follows; (i) to determine and analyze the effect of the Gross Domestic Product (GDP), population, inflation, unemployment rate, and youth illiteracy rate on the number of poor people (poverty rate) in ASEAN countries. This study is expected to provide some benefits to: 1) the ASEAN Community, where it can be used as a material consideration or evaluation of poverty alleviation programs outlined in the development program and also be as a material to give more insight about poverty situation in ASEAN regions, 2) the scientists, as it can be used as an input for further research, particularly on poverty.

## Theoretical Background

### Poverty Rate

Understanding the meaning of poverty is extremely diverse, diversity in the definition of poverty due to the problem has been creeping on a multidimensional level, means poverty related to one another with a variety of dimensions needs human. Inability to meet minimum living standards in accordance with the feasibility level is said to be living can be said as poverty (Todaro, 2006). Poverty can also be defined as the inability to meet minimum living standards (Kuncoro, 2003).

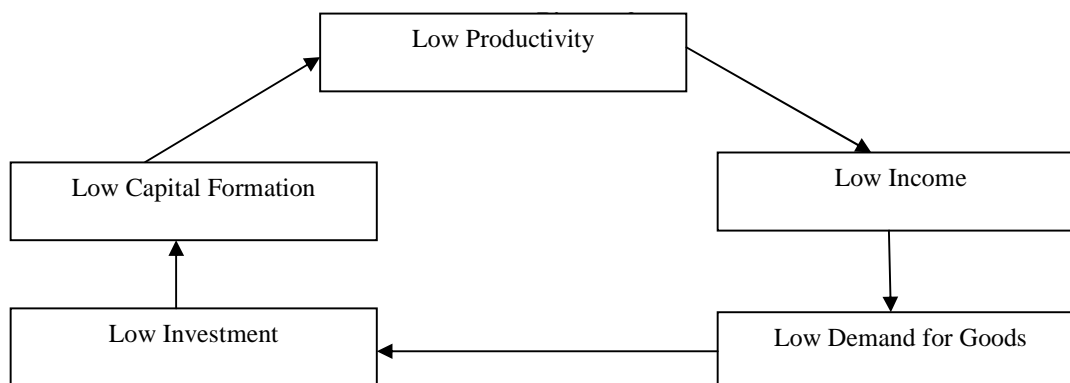
The criteria of inequality by the World Bank are based on the portion of the national income experienced by the three layers of the population, i.e. 40% of the population had low-income, 40% middle-income, and 20% were of high-income residents. The inequality of the income distribution is expressed when 40% of the low-income residents enjoy less than 12% of the national income. Inequality is moderately considered if 40% of the poor people enjoy between 12-17% of national income. Meanwhile, if 40% of the low-income residents enjoy more than 17% of national income, then the discrepancy or gap is said to be soft, and the distribution of national income is considered evenly fair.

Poverty can be forms of different types like absolute poverty and relative poverty. There may be many other classifications like urban poverty, rural poverty, primary poverty, secondary poverty and many more.

### Poverty Trap Circle from Demand Side

In poor countries an incentive to embed capital is very low, due to the vast market for various types of goods for a limited, this is caused by the people's income is very low. Income communities are also very low, because there is low productivity levels, as form of a limited rate of capital formation in the past. This caused capital formation is limited due to shortage, and so on.

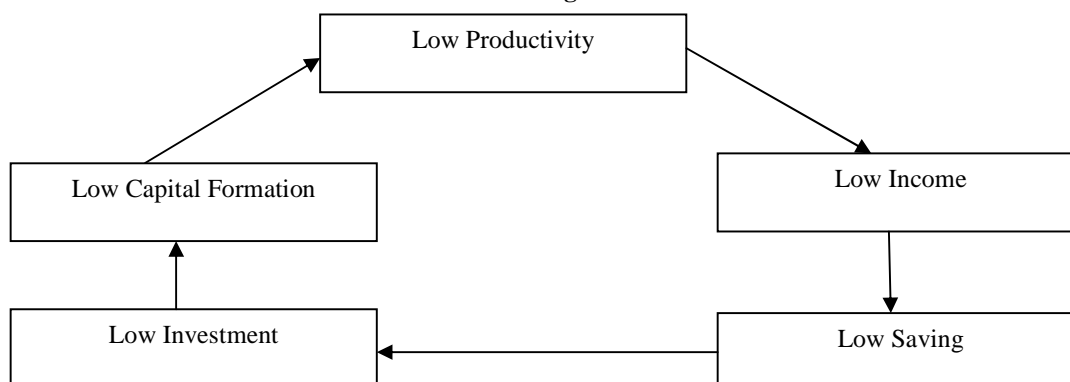
Figure 1



### Poverty Trap Circle from Supply Side

Low income levels caused by low productivity will cause poor ability to people to save. Because the ability to saving low, it will cause the low level of capital, and the low level of capital formation (investments). This will lead to a lack of capital, and thus level productivity also low and it will repeat again from the beginning.

Figure 2



### Factors Influence Poverty Rate

#### Inflation Rate

An inflation is the tendency of prices to rise in general and continuous (Miraza, 2005) conditions. However, if the price increases for only one or two items, it is not called as an inflation, unless the increase is widespread or the increase is noted in the price of other goods (Sumarsono, 2007). The increase in the prices of goods is not necessarily of the same percentage. The inflation occurs due to excess demand which depends on the elasticity of supply. The greater the elasticity of supply, means that the increase in prices will be offset by the increased production so that the price increase is not significant. In the short term, when there is idle capacity

and yet it suffices in the foreign exchange, it will increase the demand and elevate the production as well as encourage the increase of imported goods. In other words, the effect of the increase in demand has a greater influence on the increase in the production. So "demand pulled inflation" would be more dangerous when there is a "constraint" in terms of foreign exchange and when the economy has been in a position that is almost labeled as "full employment".

### **The growth of Gross Domestic Product**

The economic growth can be interpreted as the increase in the output per capita in the long run. In that sense, there are three aspects that need to be highlighted, namely the process, output per capita, and the long-term. Growth as a process, means that an economic growth is not serving as an economic picture at a time. Economic growth associated with output per capita, means that it is related to two things, namely the total output (GDP) and population, because the output per capita is the total output divided by the population. Meanwhile, in the long-term, it implies that the increase in the output per capita must be seen in quite a long period of time (10, 20, or 50 years, even longer). The increase in the output per capita in one or two years later following the decline is not economic growth.

Economic growth is an indicator to see successful development and is a requirement for reduction poverty level. This condition will be an effective economic growth in reducing poverty, when a country can produce high economy growth. According to Kuznets (Tulus Tambunan, 2001), growth and poverty has a very strong correlation, because on stage the beginning of the development process is likely to increase the level of poverty and upon approaching the final stage of development the number of people poor gradually reduced. Kuznets in Todaro (2003) also said that in the early stages of economic growth, income distribution tends to deteriorate, but on the next stage, the income distribution will improve.

So, it can be concluded that the larger the GDP of a region indicates more affluent areas where the poverty will be reduced.

### **Unemployment Rate**

Since long time ago, unemployment rate and poverty rate always found intertwined. Unemployment and poverty are the two major challenges that are faced by all the countries around the world. It is true that unemployment and poverty are mostly common in the less developed economies. However, due to the global economic recessions, the developed economies are also facing these challenges in the recent times.

Unemployment leads to financial crisis and reduces the overall purchasing capacity of a nation. This in turn resulting in poverty, and also followed by increasing burden of debt. Whatever be the type of poverty, the basic reason has always been lack of adequate income. Here comes the role of unemployment behind poverty. Lack of employment opportunities and the consequential income disparity bring about mass poverty in most of the developing and under developed economies of the world.

### **Population**

According to Said (2001), is the population is the number of people who reside in an area at a specific time and is the result of processes namely demographic fertility, mortality, and migration. Human resources is an important factor in economic growth, but not solely dependent on the population, but more emphasis on the efficiency and the productivity of the population. Over population or too high population density will be inhibiting economic development in developing countries. Low income per capita and low level of capital formation will make it increasingly difficult for developing countries to sustain the population explosion. Even if output increased as a result of better technology and capital formation, this increased will be swallowed by a population that is too much. As a result, no improvement in the real growth rate of the economy (Jhingan, 2003).

In general, population growth in developing countries is very high and in a huge number. Population issues are also concerns the interests of development and welfare of the people overall human. In the context of population development, there are two different point of view, who regard it as the obstacles to development, and also some are regarded as development boosters. The reason why population is seen as a barrier to development, due to the large population and with high growth, it only added burden to the development. Large population will reduce income per capita and generate employment issues (Dumairy, 1996).

Meanwhile, population is seen as a driver of development because high population is actually a bigger potential market which has been a demand source for various goods and services which will then mobilize a wide range of

economic activities. It can create economies of scale in production that will benefit all parties, reduce production costs and create sources of supply or supply of cheap labor in sufficient quantity so that in turn will stimulate the production of aggregate output. This in turn is expected to improve the welfare society, which means the poverty rate would go down (Todaro and Smith, 2006).

According to Nelson and Leibenstein (quoted from Sadono Sukirno, 1983) there is a direct influence of population growth on the level of social welfare. Nelson and Leibenstein indicate that rapid population growth in the developing country causes the level of welfare is not that significant and in the long run might decrease the well-being and increase the number of the poor. A population that is too much or too high density of the population will become the obstacles to development economies, especially in developing countries.

### Education Level/ Youth Literacy Rate

Education is all power efforts to promote manners, mind and physical to child in order to advance the perfection of life, namely living and turn the child in harmony with nature and society. In order to achieve economic development (sustainable development), education sector plays a very strategic role which can support the process production and other economic activities. In this context, education is considered as a tool to achieve sustainable, because with education development activity can be achieved, so the opportunity to improve the quality of life in the future will be better. Education plays as a key in shaping capabilities in a country to absorb modern technology and to develop capacity to create growth and development (Todaro, 2004). The new growth theory emphasizes the importance of the role government, especially in raising human capital development and encourage research and development to improve human productivity. The higher the level of education a person, then knowledge and expertise will also be increased so that it will encourage increased work productivity. According to Simons (quoted from Todaro and Smith, 2006), education is a way to save themselves from poverty. One measurement of an education level is the youth literacy rate.

### Research Methodology

This study uses a quantitative approach to analyze the factors that affect the poverty rate in the fifth ASEAN countries. In doing this, quantitative analysis used econometric tools by using panel data analysis tool because it has the data comprising time series and cross section. Type of panel data used in this study is a balanced panel, where each unit cross section has the same number of time series observations.

### Variables and Its Measurement

Variables that are used in this research are divided into two (2) type of variables, the dependent variable and the independent variable. The dependent variable in this study is the poverty rate, and the independent variables used consisted of the inflation rate, growth of GDP, unemployment rate, total population, and youth literacy rate.

**Table 1. Variables**

Type of Variable	Variable	Variable Scale
Independent Variable	Inflation Rate	Ratio Scale
	Growth of GDP	Ratio Scale
	Unemployment Rate	Ratio Scale
	Population	Ratio Scale
	Youth Literacy Rate	Ratio Scale
Dependent Variable	Poverty Rate	Ratio Scale

### Definitions

The operational definition of each variable used in this study are:

1. Poverty rate in this research is measured by the number of poverty gap at national poverty lines, which is expressed in %.

2. Inflation, the inflation rate as measured by the Consumer Price Index (CPI). This variable is expressed in terms of percent (%).
3. Unemployment rate is the total unemployment, as the percentage of labor force.
4. Growth of GDP, it is the growth of gross domestic product, in a country, which is expressed as%. To get the number of its variable, we compare the GDP in current year with the previous year.
5. Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship-except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. In this research, the total population is measured by the growth of total population in the current year compared with the previous year, and is expressed in percentage.
6. Youth literacy rate is the literacy rates of 15-24 years old, men and women in a country, which is expressed in percentage.

### Data Collection

The data used is secondary data from the World Bank, the International Monetary Fund (IMF), and the Asian Development Bank (ADB).

### Model Formulation

The design of the model will be presented in a linear regression model with five independent variables, with the following model:

$$\text{Poverty Rate} = \alpha_0 + \alpha_1 \text{ Inflation} - \alpha_2 \text{ Growth of GDP} + \alpha_3 \text{ Unemployment} - \alpha_4 \text{ Education} + \alpha_5 \text{ Population} + e$$

With  $\alpha_0 = \text{constant}$

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5 = \text{coefficient}$

$e = \text{residual}$

### Analysis Tool

The analytical tool used in this research is panel analysis and using Eviews as its software. The panel data is a combination of cross section data with time series data. Panel data model that can be generated is a common effect, Fixed Effects and Random Effects.

### Stationary Test

Before estimating panel models, the first thing to do is to test the stationary condition for each variable. Stationary test is done to avoid spurious regression. In this study, the stationary test was conducted by using Levin-Lin-Chu stationarity test to see stationarity condition among overall variables (common unit root) and also the Im-Pesaran-Shin stationary test to see the condition of the individual variables (individual unit root).

The hypothesis proposed:

$H_0$ : variables are not stationary.

$H_a$ : stationary variable.

Decision making is  $H_a$  will be rejected if the value of Prob. > Alpha (0:05) and the statistical values of these variables is positive.

### Chow Test

Chow test conducted to choose between Pooled Least Square model and Fixed Effect model. The hypothesis is as follows:

$H_0$ : models Pooled Least Squared (PLS) is better.

$H_a$ : Fixed Effect models better.

Proposed decision is if the result of Prob. > F is smaller than the value of  $\alpha$  (5 percent), then  $H_0$  will be rejected and  $H_a$  accepted, and vice versa.

### LM Test

This test is used to choose between Pooled Least Squared or Random Effect. The hypothesis is as follows:

$H_0$ : Pooled Least Squared model is better

$H_a$ : Random Effect models better

Proposed decision is if the result of Prob. <  $\alpha$  (0:05), then  $H_0$  will be rejected, and vice versa.

**Hausman Test**

Hausman test is used to determine the best model among the models of Fixed Effects and Random Effects. The hypothesis is as follows:

Ho: Random Effect model is better

Ha: Fixed Effect model is better

If the Probability of Chi-square  $> 0.05$  then Ho is accepted and the model used is Random Effect. But if the Probability  $< 0.05$ , the model used is the Fixed Effect.

**Model Evaluation Method**

After the results of data processing by using panel data analysis is done, we must evaluate the model. Estimation methods produced through the panel data analysis methods should be evaluated based on the following criteria:

**Individual Test (T-Test)**

Individual test is done by testing the significance of the coefficients of each variable. T-Test is used to determine whether the independent variable (X) is significant to the dependent variable (Y). This test is done by comparing the t-test or a t-statistic with a t-table at  $\alpha$  significant level 10%.

**F-Test**

Simultaneously test is done to prove the existence of significant influence of the independent variables on the dependent variable overall.

**Goodness of Fit Test**

Goodness of Fit test aims to explain whether the change of independent variables in the model is quite able to explain the change of the dependent variable. The coefficient of determination is noted with R<sup>2</sup>. The value of R<sup>2</sup> that is near to one is what a model needs to be categorized as good. If the value of R<sup>2</sup> closes to zero, it means that the independent variables that exist in the method is not able to explain the change of dependent variable. So, the higher the value of R<sup>2</sup>, the better the model means

**Result****Stationarity Test Result**

Results and discussion in this study is done based on the steps that have been described previously. The first step in conducting an econometric analysis to analyze the time series data is to do a test to see variable stationary or not. Stationarity test that is used is Levin-Lin-Chu stationary test and Im-Pesaran-Shin stationary test. Stationarity test results can be seen in Table 1 below. Based on test results obtained, it shows that all variables are stationary at a level so that the level of the test data is continued and there is no change in the model of the data used.

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**Table 2. Stationarity Test Result**

No.	Variable	Stationarity Test			
		Levin-Lin-Chu		Im-Pesaran-Shin	
		<i>Statistic</i>	<i>P-value</i>	<i>Statistic</i>	<i>P-value</i>
1.	Poverty Rate	-0.4011	0.0466	-1.2107	0.0121
2.	Growth of GDP	-3.0777	0.0010	-2.8799	0.0030
3.	Inflation Rate	-0.0685	0.0117	-3.8584	0.0499
4.	Population Rate	-6.0064	0.0000	-1.3321	0.0343
5.	Unemployment Rate	-1.3840	0.0284	-3.4460	0.0002
6.	Youth Literacy Rate	-1.3131	0.0126	-0.2339	0.0566

**Chow and Hausman Test**

Tests that were first performed to make a selection panel data model is the Chow test. Based on Chow test results, it appears that a better model is the Fixed Effect model. Having chosen the model Fixed Effect, it is necessary to do the Hausman test to compare between Random Effect model and Fixed Effect models. Based on the Hausman test results, it shows that the chosen one is Ha, and stated that the Fixed Effect better. This is because the value  $\text{prob} > \chi^2$  produced less than 0.05, that is equal to 0.0180. Thus, in this study, panel data model used is the Fixed Effect.

**Table 3. Chow and Hausman Test**

Method	Probability	Decision	Explanation
Chow Test	0.0216	Reject Ho	Fixed Effect
Hausman Test	0.0180	Reject Ho	Fixed Effect

**Panel Data Analysis Result**

Based on estimated results of the panel data model, the model can be obtained in the aggregate for the seven ASEAN countries is as followed:

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**Table 4. Panel Data Analysis Result**

<b>Dependent Variable: Poverty Rate</b>			
<b>Variable</b>	<b>Theoretical Sign</b>	<b>Coefficient</b>	<b>p-value/2</b>
Growth of GDP	-	-0.456641	0.0015
Inflation Rate	+	0.031308	0.0320
Population Rate	+	0.013510	0.0165
Unemployment Rate	+	0.124592	0.0975
Youth Literacy Rate	-	-0.22731	0.008
C	+	4.836375	0.000
Prob. F-Stat		0.0000	
Adjusted R <sup>2</sup>		0.5970	

Table 4 indicates that the aggregate amount of poverty rate in fifth ASEAN countries is significantly affected by all the independent variables in simultaneously. This is reflected in the value of Prob. F-statistic that has significant value, amounting to 0.0000. While based on the T-Test, it is found that the variables that have significant impact to the poverty rate in fifth ASEAN countries are the growth of GDP, population rate, youth literacy rate and also inflation rate. While the unemployment rate is found to be the one and only independent variable that has no impact on the poverty rate in the fifth ASEAN countries. We can say this because its significant value is higher than the  $\alpha$  (5%).

All variables used also has a correlation direction in accordance with the theory and hypothesis, in where the growth of GDP and youth literacy rate have negative impact on poverty rate, while the others (inflation rate, population rate, and unemployment rate) have positive impact to the poverty rate. But because the impact of unemployment rate is not significant statistically, we say that there is no significant impact from the unemployment rate to the poverty rate in fifth ASEAN countries, although it has the appropriate sign, based on the theory. So this research will focus the discussion on the variables that have significant impact on poverty.

The value of Adjusted R-Squared of 0.5970 indicates that all independent variables that are used is able to explain the behavior of the dependent variable (poverty rate) amounted to 59.70%, while the remainder, amounting to 40.3% of the behavior of the dependent variable explained by other variables that are not used in the model. These factors may consist of the level of infrastructure, availability and productivity of labor, political stability, and also the consumptive nature of the society of a country, or other factors.

Based on the results, it can be concluded that while there was a 1% increasing of GDP for the fifth ASEAN countries, the magnitude of ASEAN poverty rate will decrease by 0.456641%. This influence also demonstrated statistically significant. This is in line with theory and hypothesis, that the current level of GDP increases, which means an increase in income, market size and purchasing power, the poverty rate will decrease. Likewise, when a decline in GDP of 1%, ASEAN FDI will decrease by 0.456641% of GDP level. This variable has the highest impact on the poverty, among other variables.

The impact of education, measured by the youth literacy rate is significant. When there is a 1% increasing in youth increasing rate, the poverty rate will decrease about 0.22731%. This variable plays the second high role that impacts poverty rate in the fifth ASEAN countries. It can be understood because when an area has a good education means the quality of the resource humans in the area was also good. Education plays a key in forming a developing country's ability to absorb modern technology and to develop the capacity to create growth and sustainable development (Todaro, 2000). So, people who have the quality of higher education will be able to produce goods and services optimally so that it will acquire optimal income as well. If the high-income population, then all needs will be met and away from the cycle of poverty.

The impact of total population to poverty rate is positive. When there is a 1% increasing of total population in the fifth ASEAN countries, it means that the poverty rate will also increase about 0.013510%. There are several things that make residents as a driver of development and negatively affect the level poverty. Population as a driver of development for the population the greater is the potential market is the source of the request will be a wide variety of goods and services which will then move a wide range of economic activities that create economies of scale in production that benefit all parties, lowers costs production and create new sources of supply, or the supply of labor cheap in sufficient quantity so that in turn will stimulates the production of aggregate output or higher and on ultimately expected to improve the welfare of society, which means the level of poverty would down (Todaro and Smith, 2006). But this findings shows that for ASEAN countries, the impact of population rate to poverty is still positive. It might be because the increasing in the population is found as a burden for the development in ASEAN countries. And it might be also because there are many unproductive people in the country.

The inflation rate is found has a positive impact on poverty rate. When there is a 1% increasing on the inflation rate in the fifth ASEAN countries, then the poverty rate will also increase about 0.031308%, and vice versa. Inflation rate shows about the stability of economy in a country, it means that ASEAN countries should taken care more in their stability of economy to decrease the poverty rate.

### Conclusion and Suggestion

The purpose in this research is to see the impact of inflation rate, the growth of GDP, the total population, youth literacy rate, unemployment rate in fifth ASEAN countries, during 1990 – 2013. Data used are the secondary data. The result shows that only the unemployment rate that has no impact to the poverty rate, while other variables have the significant impact to poverty rate in the fifth ASEAN countries. It means that ASEAN should take care each of these factors to maintain its poverty rate, especially the GDP and education level (youth literacy rate) that are the first and two factors that have high impact on poverty rate. The ASEAN region should be able to maintain their economy growth high and provide good and qualify education.

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