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THE EFFECT OF ECONOMIC GROWTH AND TOTAL POPULATION ON POVERTY LEVEL IN NORTH SULAWESI

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ABSTRACT

This study aims to test and analyze the effect of economic growth and total population to the poverty level in North Sulawesi. The study was conducted in the districts/cities located in North Sulawesi province with a total of 14 districts/cities. The data taken is after the year of 2008, this due to the district/city is lastly bloomed in 2008. The data used in this research is quantitative data. This study uses secondary data and the time series data from the year of 2009 until 2016. Panel data is used as a combination of time series and cross section. Meanwhile the crossed section data is taken from all districts/municipalities in North Sulawesi province which is 14 districts/cities (10 districts and 4 cities) with a total of 98 observations obtained in this study. The data used in this research is secondary data obtained from the Central Bureau of Statistics (BPS) at national level. Inferential statistical methods used in the analysis of research data is Dynamic Panel Data (DPD) considering that the sample size is relatively small. This study examined the effect of exogenous variables i.e. economic growth and total population, while the endogenous one is poverty level. The result shows that simultaneously, economic growth and total population have a significant effect on poverty level in North Sulawesi.

Keywords: Economic Growth, Total Population, Poverty Level, Dynamic Panel Data

I. INTRODUCTION

Development is essentially a process of continuous change towards progress and improvement to be achieved, development must be viewed as a multi-dimensional process that encompasses fundamental changes to social structure, attitudes of society and national institutions while still pursuing accelerated economic growth, handling income inequality as well as poverty alleviation (Todaro, 2006). Kuznets (1965) defines economic growth as a long-term capacity-building of a country to provide various goods and services to the population. Thus, the manifestation of

economic growth is manifested in increasing long-term or sustainable output (Todaro, 2006).

The Indonesian economy in 2015 grew by 4.88%, lower than previous government estimates. In fact, the achievement was the lowest in the last five years. One cause is the end of the commodity boom so that export performance slumped. However, amidst the declining income of the provinces of commodity producers, Sulawesi is still able to grow above the national economic growth rate.

However, not all islands feel the economic slowdown in 2015. Java, Bali, East Nusa Tenggara (NTT), Sulawesi, Maluku and

Papua have grown above the national economy. Java as the largest contributor to the economy recorded an economic growth of 5.85%, while Bali and Nusa Tenggara grew 10.29%. One thing that should become a concern, Sulawesi's economic growth reached a point of 8.18%. In the case of a number of provinces on the island of Sulawesi rely solely on raw material commodities.

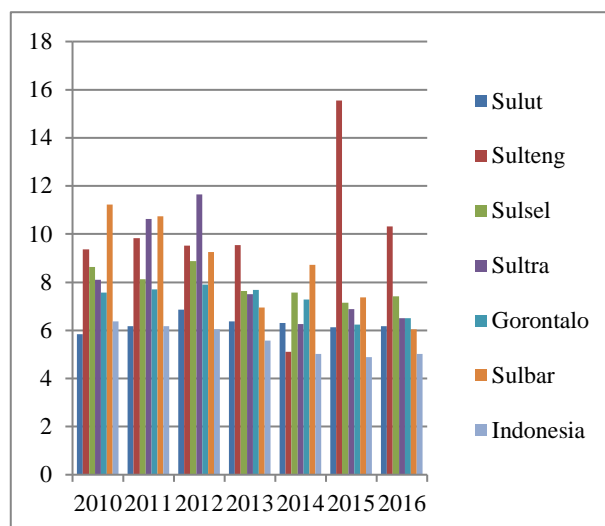


Figure 1. Economic Growth by Province in Sulawesi During 2010-2016

Source: Central Bureau of Statistics (2017)

The high rate of poverty in North Sulawesi (Sulut) province, influenced by various factors. besides the influence of economic growth factors, the problem of uneven distribution of income is also one of the dominant factors that can increase the poverty rate. For the Province of North Sulawesi in the period of 2010-2016, the Gini Ratio ranges from 0.28-0.49. This indicates that for districts/municipalities in North Sulawesi, they have a moderately categorized income distribution level. In addition, the high growth rate of the population that for most developed countries is called as a demographic bonus, but on the other hand, it can be one of the factors that trigger poverty if not controlled and not utilized properly.

The population of North Sulawesi Province increases from year to year. This increase becomes higher due to the natural increments (the difference between birth and death). The migration factor is not as

influential as net migration is close to zero. During the period of 2009-2015 the population increased with a population growth rate of 1.07% per year. Population growth exceeds 1% occurs in all districts except for Sangihe District. The population growth of Sangihe District is low at 0.37% per year (see figure 2).

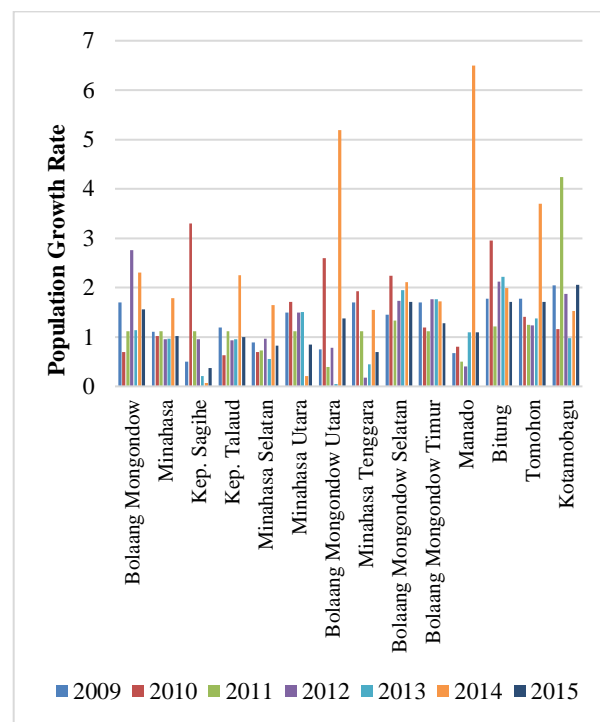


Figure 2. Population Growth Rate of District /City in North Sulawesi Province During 2009-2015 (%)

Source: Central Bureau of Statistics (2016)

Siregar and Wahyuniarti's (2007) study on "The Impact of Economic Growth on the Decrease of the Poor People" resulted in the finding that an increase in the population of 1000 will increase the number of poor people by 249. Several findings of similar research show that the increase in population has been proven to increase the number of poverty level in Indonesia. If population growth is not matched by efforts to control the increase, uncontrolled conditions of population growth can pose a severe threat to urban growth. As expressed by Malthus (2004) that the increase of population progressively exerted heavy pressure, and if not prevented, it leads to widespread misery and hunger.

Figure 3 show the distribution of poor and economic growth in North Sulawesi Province in 2009 -2015:

	High Growth	Low Growth
High Poverty	Quadrant I 1. Southeast Minahasa 2. South Bolaang Mongondow 3. Sagihe Islands 4. South Minahasa 5. North Bolaang Mongondow 6. Minahasa 7. North Minahasa 8. Tomohon 9. East Bolaang Mongondow	Quadrant III 1. Talaud Islands 2. Bolaang Mongondow
Low Poverty	Quadrant II 1. Manado 2. Bitung 3. Kotamobagu	Quadrant IV -

Figure 3. Distribution of Poverty and Economic Growth in District / City on North Sulawesi Province in 2009– 2015

Source: Central Bureau of Statistics (2016)

The existence of backwardness, market imperfection and lack of capital causes low productivity resulting in low income received. Low income will have implications for low savings and investments that result in poverty and so on. Data on the development of poor districts/city in the province of North Sulawesi can be viewed in the table 1.

Table 1. Poor People in North Sulawesi During the Period of 2009-2015

Year	Poor People		Line of Poverty (Rupiah)
	Amount (000)	%	
2009	210,100	9,79	208,822
2010	206,720	9.10	194,334
2011	195,620	8.51	212,823
2012	190,210	8.18	215,260
2013	185,520	7.88	237,672
2014	208,230	8.75	261,117
2015	208,540	8.65	295,365

Source: Central Bureau of Statistics (2016)

Danielson (2002) found that in Jamaica, per capita growth that lasted from 1988 to 1998 had a major impact on poverty reduction. This is possible, according to Danielson, because during that period there was no great increase in terms of inequality or inequality in society. Dollar & Kraay (2002) said that economic growth would provide far greater benefits for poverty if growth is accompanied by policies such as law enforcement, fiscal discipline, openness in international trade, and poverty alleviation strategies.

This opinion seems to reinforce the opinion of Bigsten and Levin (2000) before, that a successful country in economic growth will likely also succeed in reducing poverty, especially if there is appropriate policy supports and institutional environment. Based on the Kuznets Theory (Kuznet, 1955) who argue that the relationship between poverty and economic growth shows a negative relationship, where if there is economic growth will reduce poverty.

Based on the facts, theories and empirical studies, this study raised a substantial issue to solve namely: does the economic growth and the number of population affect the level of poverty in North Sulawesi Province? The objective to be achieved in this study is to examine and analyze the influence of economic growth and the number of population on the level of poverty in North Sulawesi Province.

II. RESEARCH METHODS

In North Sulawesi Province there are 14 districts/cities namely Minahasa, Sangihe Islands, Talaud Islands, Bolaang Mogondow, South Minahasa, North Minahasa, North Bolaang Mongondow, Southeast Minahasa, South Bolaang Mongondow, East Bolaang Mongondow, Manado, Bitung, Tomohon and Kotamobagu. Given, the data used in this study is the data of economic growth and total population. in the form of time series 2009-2015, then the data is taken starting from 2008, with the stipulated that the most recently expanded districts / cities is the year of 2008 that is Tomohon city.

The data used in this study is secondary data. The data used is crossed section data from 14 districts/cities and time series data from 2009 to 2015. Thus the data in this study is paneled data (pooled data) with the number of observations of 98 observation.

A. Classification of Variables

Economic Growth (X1) and Total Population (X2), are classified as exogenous variables and act as independent variables, i.e. variables whose diversity is not influenced by other independent variables within the model and no causal relationship is established. Exogenous variables are

beginner variables that give effect to other variables. Meanwhile, Poverty Level (Y) is an endogenous-dependent variable and acts as a variable whose diversity is explained by independent variables. The details of each variables analyzed in this research are as follows:

1. Economic growth is the growth of GRDP in districts/cities in North Sulawesi Province during the year of 2009 - 2015 based on constant 2010 prices. Data obtained from the Central Bureau of Statistics (BPS) of North Sulawesi Province.
2. Total population is the total population in districts/ cities in North Sulawesi Province in 2009 - 2015 of the current year. Data obtained from Central Statistics Agency (BPS) of North Sulawesi Province.
3. Poverty level (Y) is the number of people who are below the poverty line in districts /cities in North Sulawesi Province in 2009 - 2015. Poverty level is measured using Headcount Index (HCI). Data obtained from Central Statistics Agency (BPS) of North Sulawesi Province. Headcount Index formula as follows:

$$Po = \frac{No}{N}$$

Description:

- Po = Headcount Index
- No = Number of Poor People
- N = Total Population

$$Y = \beta_0 + \beta_1 Y_{it-1} + \beta_2 X1_{it} + \beta_3 X2_{it} + \mu_{it}$$

Where as :

- Y** = Poverty Rate
- Y_{it-1}** = Lag Poverty Rate of District/ City
- $X1_{it}$** = Economic growth of District/City and time t
- $X2_{it}$** = Population of District/City and time t
- μ_{it}** = Error term

The next step is to find the estimated value of the equation above by using

Dynamic Data Panel (DPD) method and data processing using Stata 13 program software.

B. Dynamic Panel Data (DPD)

Panel data (pooled data) is a data set containing individual sample data (household, company, district/city, etc.) for a certain period of time. In this data type we collect observations according to collected for a certain amount of time in the sample. In other words, the data panel is a combination of time-series data and cross-section data. Panel data is very useful data because this type of data helps researchers to explore the activities of economic actors not only between individuals but economic behavior across time.

The Dynamic Panel Data Model can be written as follows:

$$Y_{it} = \alpha_i + \beta'x_{it} + \varepsilon_{it}$$

for other formats can be written as:

$$Y_{it} = \alpha_i + \sum_{k=2}^k \beta x_{it} + \varepsilon_{it}$$

While the dynamic model is written as:

$$Y_{it} = \alpha_i + \beta'x_{it} + \partial Y_{it-1} + \varepsilon_{it}$$

The conceptual framework of this research is pictured in figure 4:

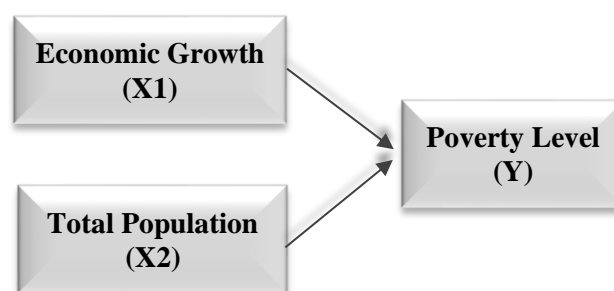


Figure 4. Conceptual Framework

C. Hypothesis

Based on the description on the background, the formulation of the problem, the purpose of the study and the theoretical studies explained, then the hypothesis that will be proven that the economic growth and

total population significantly influence the poverty level in North Sulawesi.

Hypothesis testing

The analysis model used in this research is the GMM panel (Generalized Method of Moments). The estimation results can be seen in the table 2.

Table 2. Panel Data Regression Estimation Results with GMM Arellano Bond

Variable	Coefficient	Std. Error	z-statistics	Prob
Lag	0.1668911*	0.0502306	3.32	0.001
X1	-0.0209564*	0.003553	-5.90	0.000
X2	0.0055881*	0.0012475	4.48	0.000
Wald test	191.02 (0.0000)			
Sargan test	10.82475 (0.6997)			
AR (1)	-2.546 (0.0109)			
AR(2)	-1.5841 (0.1132)			

Based on the result of GMM panel estimation, p-value of Sargan test 0.69 shows more than 10% significance level. The Sargan test results indicate that the model used is valid. The auto correlation AR test result (2) shows no auto correlation in the model. It can be seen p-value AR (2) 0.11 more than 10% significance level.

D. Test z (Partial)

The z test on the GMM panel is performed to determine the partial effect of the independent variable on the dependent variable. From table 2, it can be seen that lag variable of poverty level ($Y\beta_{it-1}$) have significant effect with coefficient value equal to 0.1668911.

Economic growth variable (X1), have a significant effect with the negative correlation to poverty rate with coefficient of -0.0209. Variable of total population (X2), have a significant and positive effect on poverty rate with coefficient of 0.0055881.

E. Wald Test (Simultaneous)

Wald test on GMM panel is done to know the effect of independent variables to dependent variable simultaneously. Based on

the Wald test, p-value is below 1% significance level. This shows that the independent variables all together influence the dependent variable.

III. EMPIRICAL FINDINGS

In the 14 districts studied within the period of 2009 - 2015, the following findings were obtained that:

1. Economic growth negatively affects poverty levels in district/cities in North Sulawesi. The direction of a negative relationship indicates that an increase in economic growth causes a decrease in poverty levels in districts in North Sulawesi. This is in line with expectations, where with a negative relationship, means that economic growth in the districts/cities in North Sulawesi Province leads to a decrease in poverty levels. The impact of poverty reduction due to economic growth can occur in the short term and in the long term.
2. The total population positively affects poverty levels in districts/city in North Sulawesi. This is consistent with the hypothesis which states that population growth affects poverty levels of districts in North Sulawesi. For North Sulawesi, population growth has a significant effect on poverty level, where with the increase of population, can increase poverty level. A high population growth rate can lead to a decline in economic growth. The negative consequence of this population growth is due to capital dilution (the increasing population decreases the amount of working capital, assuming constant capital), as well as the scarcity of natural resources, due to competition for natural resources.

A. The Effect of Economic Growth on Poverty Level

Partial test results with dynamic data panel method, for economic growth variable (X1) negatively affect the poverty level (Y) at a level with coefficient of -0.0209. This shows that in North Sulawesi, economic growth (X1) has a negative effect on poverty level. This means, the hypothesis that

economic growth has a significant effect on poverty level is on acceptable. Economic growth has a negative correlation to the level of poverty in the districts studied. Negative relationships mean a decrease in poverty rates as a result of increased economic growth.

The value of coefficient of economic growth variable (X1) to poverty level (Y) is with coefficient of -0.0209, as presented in Table estimation result. The value shows negative and unidirectional relationship, which means that the increase of economic growth impact on the decreasing of poverty level districts /cities studied.

For the conditions in North Sulawesi, that with an increase in economic growth affect poverty. The direction of this negative relationship is a finding that fits into the theory of economic growth. In regional economic growth is a process of local government and its people in managing existing resources to create new jobs and stimulate the development of economic activity within the region (Arsyad, 1999). The significant and negative impact of economic growth (X1) on poverty rate (Y) in North Sulawesi can be explained by empirical facts as in figure 5.

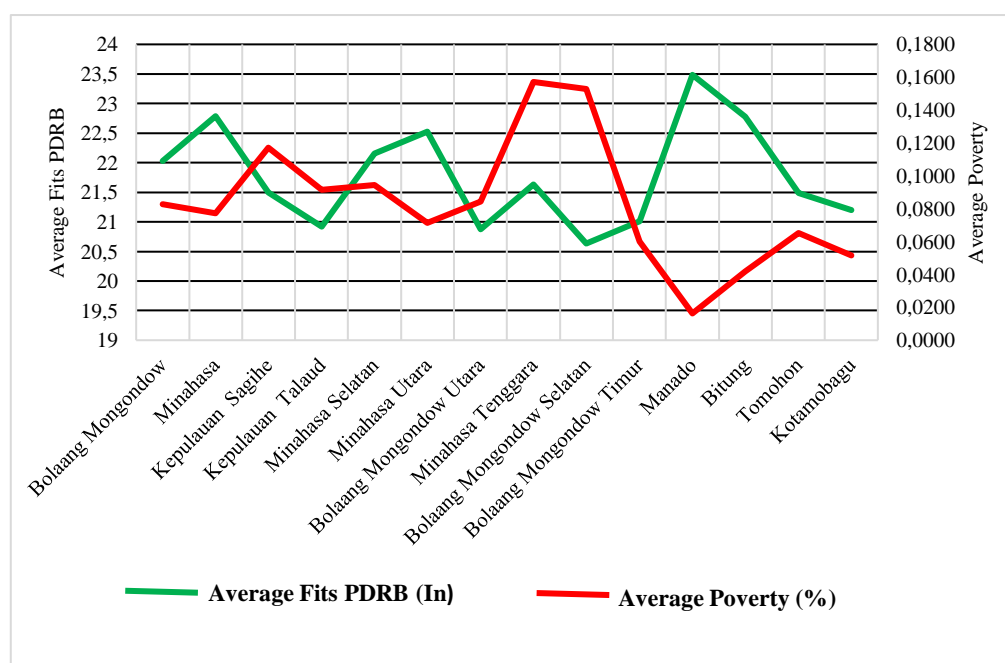


Figure 5. Economic Growth and Poor District /City in North Sulawesi Province in 2009-2016

Source: Central Bureau of Statistics (2016)

(Utara: North, Selatan: South, Timur: East, Barat: West, Tenggara: Southeast)

The district that have high poverty and but have the highest or moderate economic growth compared to other districts/ cities in North Sulawesi, namely Talaud District with economic growth rate of 5.4%, has a poverty rate of 9.76%. Furthermore, Bolaang Mongondow district with an average economic growth of 5.7%, has a poverty rate of 8.40% and the third is Sangihe district

with an average growth rate of 5.6%, has a poverty rate of 11.5%. As expected, that with the occurrence of economic growth, it is expected to reduce the number of poverty in society. For the case in this study, there was an economic growth decreasing the poverty rate. The impact of poverty reduction due to economic growth can occur either in the short term or long term.

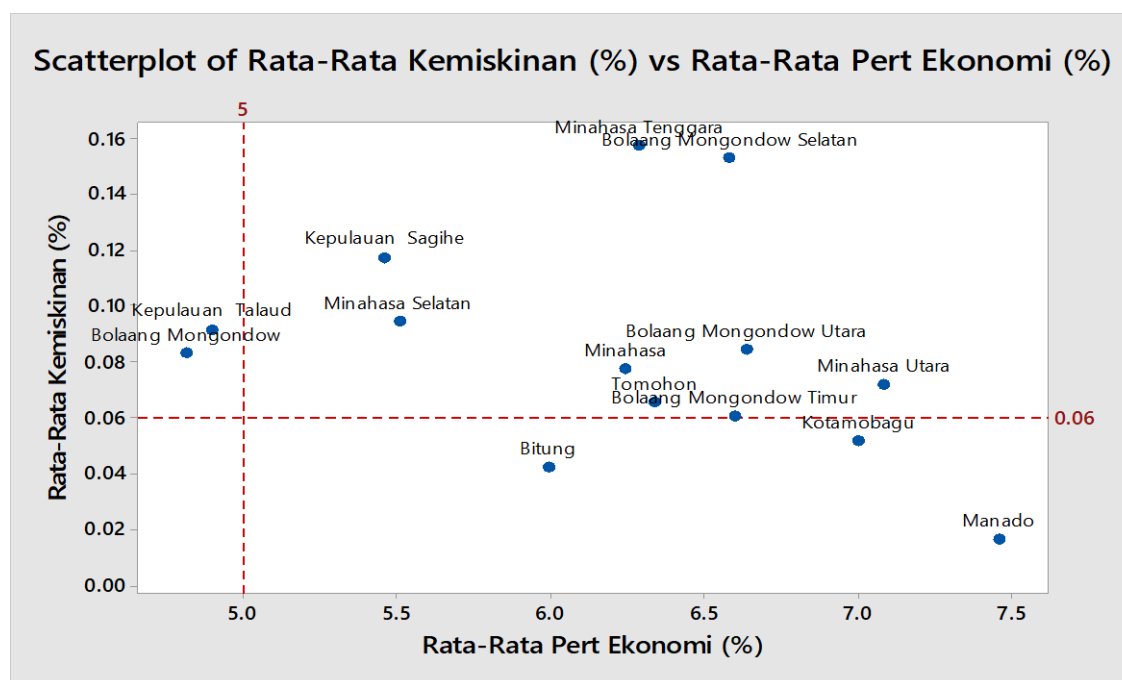


Figure 6. Poverty Rate and Economic Growth District / City in North Sulawesi Province in 2009 – 2016

Source: Central Bureau of Statistics (2016)

(Utara: North, Selatan: South, Timur: East, Barat: West, Tenggara: Southeast)
 Rata-rata Kemiskinan: Average Poverty, Rata-Rata Pert Ekonomi: Average Economic Growth)

Based on the figure 6, it is shown that there are 9 districts/cities that fall into the category of Quadrant I which is a region that has high economic growth but also has a high poverty rate which are Southeast Minahasa, South Bolaang Mongondow, Sagihe Islands, South Minahasa, North Bolaang Mongondow, Minahasa, North Minahasa, Tomohon, East Bolaang Mongondow. There are 2 regions that are classified into Quadrant III that is area of high poverty and low growth, i.e. Talaud Islands and Bolaang Mongondow

For the case in North Sulawesi Province, why the high rate of economic growth, affect the poverty level, this can be caused by several factors, the trend of movement of the magnitude of economic growth rate, which only ranges from 5% to 7.2% in the period 2010 to 2015, possibly because, the economic growth figures show quite large numbers, North Sulawesi has a very abundant natural resources, the ownership of these natural resources that make the economic growth rate is quite high. On the other hand, the number of poverty, can occur due to different factors of natural resource ownership, people who do not have natural resources, can not achieve a better life, due to

limitations to produce, they can not work on agricultural land or plantations, and entangled in the poverty ring.

B. The Effect of Population on Poverty Level

Based on the result of partial test with dynamic data panel method, for the variable of total population (X2) has positive and significant influence to poverty level (Y). Variable of total population (X2) has a significant effect to poverty level (Y) by showing coefficient value equal to 0.0055881.

In North Sulawesi, variable of total population (X2) has a significant effect on poverty level (Y). This means, the hypothesis that the variable total population has a significant effect on the level of poverty is proven or accepted. The positive coefficient of 0.0055881 means that with the increase of the total population, it can affect the increase of poverty level in North Sulawesi, although with a very small amount whereas the coefficient value is 0.0055881.

In North Sulawesi Province, the number of population is positively related to poverty level. Increased population growth has a positive correlation to poverty level in the districts studied. Positive influence of

population to poverty level, implies an increase in poverty rate as a result of increasing population growth.

The coefficient value of total population (X2) to poverty level (Y) is 0.0055, as presented in table 2. This value indicates a one-way relationship, where an increase in the increase in the number of people has an impact on increasing the poverty level in the districts studied. In the case of the Province of North Sulawesi, the increase in the number of population, has an effect on the increase in the poverty rate. The direction of this relationship is a finding that fits the existing theory.

According to Jhingan (2004), population growth at some point will lead to a condition called the stationary state, which is a time where economic development does not occur at all. After that the economy will continue to decline to a lower level where the wage is very minimal, just enough to subsistence. Population growth and decline in capital growth as a result of the work of The Law of Diminishing Return as a barrier to economic growth.

The influence of total population (X2) to poverty level (Y) in North Sulawesi can be explained by empirical facts as in figure 7.

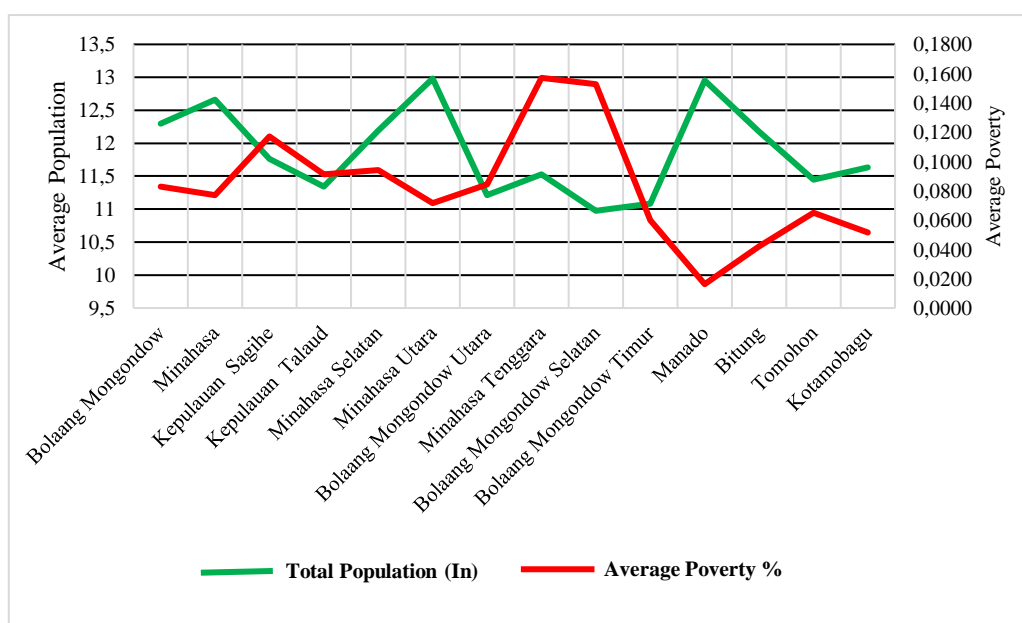


Figure 7. Number of Population and Poverty Level District /City in North Sulawesi Province in 2009-2016

Source: Central Bureau of Statistics (2016)

(Utara: North, Selatan: South, Timur: East, Barat: West, Tenggara: Southeast)

Based on figure 7, it can be seen that in the period of 2010-2015, areas with high population numbers tend to have high poverty rates, which are three district/cities, namely South Bolaang Mongondow District which has population growth rate of 1.84% per year, has a high poverty rate of 15.14%. secondly, Bolaang Mongondow District with population growth value of 1.59%, has poverty rate of 8.4%, and the third is Bitung City which has population growth rate of 2.03%, has a poverty level of 6.7%.

While areas with small population growth tend to have smaller poverty rates, such as the City of Manado, which has only a

population growth rate of 0.9% per year, has only a poverty rate of 4.86%. The results of this study show that there is a significant relationship between population and poverty level, and there are some previous studies which argue that population growth has a negative effect on economic growth and prosperity.

Liu and Yamauchi (2013), using OLS regression found that the effect of increasing population density on household consumption expenditure can be positive or negative depending on the human capital in the household. Further studies from Trang and Hieu (2011) used data from eight

developing countries in Asia in the period 1965-2005. The results obtained show that in developing Asian countries high population growth rates can lead to a decline in economic growth. The negative consequence of this population growth is due to capital dilution (the increasing population decreases the amount of working capital, assuming constant capital), the scarcity of natural resources, age structure, and living standards.

The results of a study from Albatel (2005) with cases in Saudi Arabia investigated the impact of population growth on savings and economic growth. Using Saudi Arabia samples from 1964-2000 Albatel found that population growth had a negative impact on welfare and economic growth.

Other studies have argued that population growth has a positive impact on economic growth, conducted Granger cointegration and causality tests to see the relationship between population size and long-term economic growth.

IV. CONCLUSION

Based on the analysis of the results and discussion of the effect of economic growth and the number of population on the level of poverty, the following conclusions can be put forward:

1. Simultaneously, economic growth and total population affect the poverty level.
2. Economic growth has a negative and significant effect on poverty level in districts/cities in North Sulawesi, which means that an increase in economic growth affects poverty reduction in districts in North Sulawesi Province. With a negative relationship, it can be stated that with the economic growth in districts /cities in the province of North Sulawesi the poverty level will be decreased. The impact of poverty reduction due to economic growth can occur both in the short term and in the long term.
3. Total population has a positive and significant influence to poverty level in district/cities in North Sulawesi Province. With a positive relationship, meaning with an increase in the number of people, can increase the level of poverty. Indeed, the

condition of districts/cities with high population growth rates can lead to a decline in economic growth. The negative consequence of this population growth is due to the capital dilution (the rising population decreases the amount of working capital, assuming constant capital), as well as the scarcity of natural resources.

V. RECOMMENDATION

Economic growth has a negative and significant effect on poverty levels in districts/cities in the province of North Sulawesi. This means that increasing economic growth has an impact on reducing poverty levels in districts cities in North Sulawesi Province. Thus, based on the results of this study it is suggested to the North Sulawesi regional government to make various efforts to increase economic growth, one of which is by opening jobs by facilitating investors in establishing businesses or through entrepreneurship programs, which specifically develop the informal sector and labor-intensive industries that will increase per capita income and drive the economy.

In addition, with the positive effect of total population on poverty levels, it is necessary to regulate birth rates and family planning to regulate population growth as well as an effort to improve the quality of human resources in North Sulawesi. Furthermore, the time period of the research needs to be extended, this is because this current study only covers 7 years of data and requires a wider scope of territory, research on a national scale is highly recommended.

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