ANALYSIS OF THE EFFECT OF POPULATION DEVELOPMENT, PERCAPITA EXPENDITURE AND OPENUNEMPLOYMENT RATE ON THE POOR POPULATION IN ACEH PROVINCE 2000-2019

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Abstract

This study examined the relationship between population density, per capita expenditure, open unemployment rate, and the poor people in Aceh province. This study used secondary data from 2000 to 2019. The data were analyzed using the Vector Autoregression (VAR) analysis method with the help of Eviews 10. The results indicated that population density had no positive and significant effect on the poor people, per capita expenditure had a positive but insignificant effect on the poor people, and the open unemployment rate had a positive and significant effect on the poor people.

Keywords: Population Density, Per Capita Expenditure, Open Unemployment Rate, and Poor People.

INTRODUCTION

Poverty is a complex and multidimensional problem. Poverty is a problem faced by all countries in the world, especially Indonesia. Poverty can also be interpreted as a social condition whose basic needs are not sufficient, such as food needs that are difficult to achieve, inadequate nutrition, low levels of education, difficulty in providing health services and transportation that is not smooth. (Putra, 2016). Aceh Province is one of the provinces in Indonesia and also faces poverty problems, Aceh Province is a province with low income and is below the poverty line. Whereas Aceh Province is known for its abundant natural resources to be utilized.

Of the ten provinces in Sumatra, Aceh is the province that not only has the highest APBD. However, the potential for natural wealth in Aceh Province is abundant, such as forest products, plantations, agriculture, fisheries. However, the current condition is inversely proportional to the previous poverty condition. This indicates that Aceh's APBD is high and the potential for abundant natural resources is high.

According to (Adisasmita, 2005) poverty indicators that can be used in general are the level of wages, income, consumption, early childhood mortality, immunization for child malnutrition, fertility rate, maternal mortality rate, average life expectancy, child absorption rate. elementary school age, proportion of government spending on services for basic community needs, fulfillment of food (calories/protein), clean water, population development, literacy, urbanization, per capita income and income distribution.

The condition of the people who are called poor can be identified based on the ability of income to meet living standards. The standard of living in a society is not only with the fulfillment of the need for food, but the fulfillment of the need for health, education, housing or a decent place to live is one of the standards. the standard of living or welfare of the people in an area. (Suryawati, 2004).

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The development of the poor population in Aceh province can be seen in the graph below:.

Figure 1.1
Graph of the poor in the province of aceh year 2015-2019
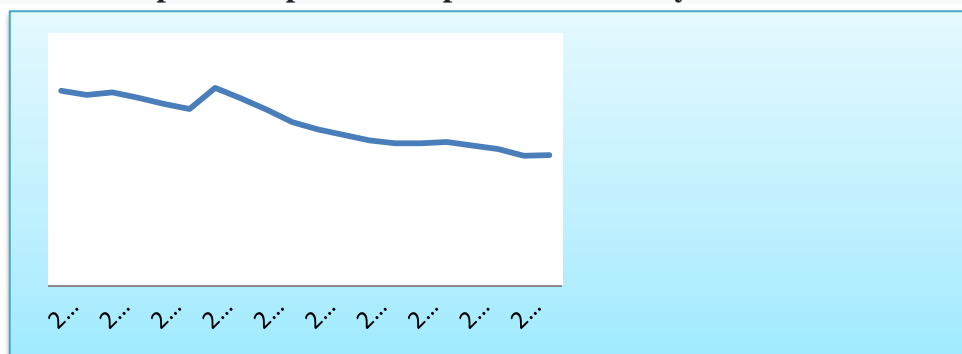
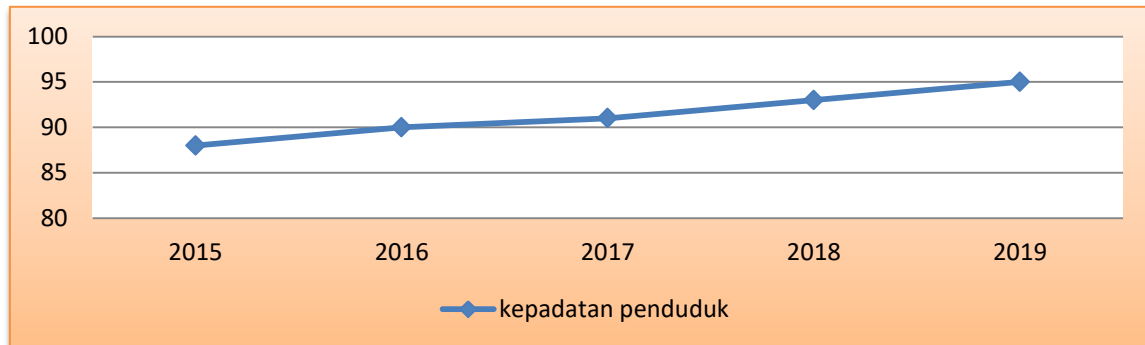Source: Central Bureau of Statistics, 2020.

The development of the number of poor people in Aceh over the last 5 years as illustrated in graph 1.1 above has decreased slightly, namely In 2015 the number of poor people in Aceh amounted to 28.55 million people to 25.96 million people in 2019. This is caused by the daily wage increase, the farmer's exchange rate increases and the national inflation rate is low. The poverty rate should have increased, and this only happened in 2018.

Another indicator that affects the poor is population density. Population density is widely regarded as a development burden and reduces per capita income and creates employment problems, this means that the increasing population density will affect the number of poor people, when the effect of increasing population density is followed by an increase in the number of workers, the labor force and employment opportunities continue increases, so the number of unemployed will decrease. In addition, the population is also considered a driver of development, because the potential market is a source of demand for various kinds of goods and services which will then move various kinds so as to create economies of scale in production that will benefit all parties. with a decrease in production costs and create a source of supply or supply of cheap labor in sufficient quantities so that it can stimulate even higher output, and in the end it can improve people's welfare which means the poverty rate will decrease (Todaro and Smith, 2006).

Population density is the ratio between the total population and the area inhabited (Mantra, 2007). This situation which shows that the population continues to increase can certainly cause several problems, such as the rapid growth of the poor population in a country which will lead to chronic poverty. Malthus describes a universal tendency that the population in a country will increase very rapidly according to geometric progression (Todaro, 2006).

The level of population density in the province of aceh can be seen in the graph below:

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Figure 1.2
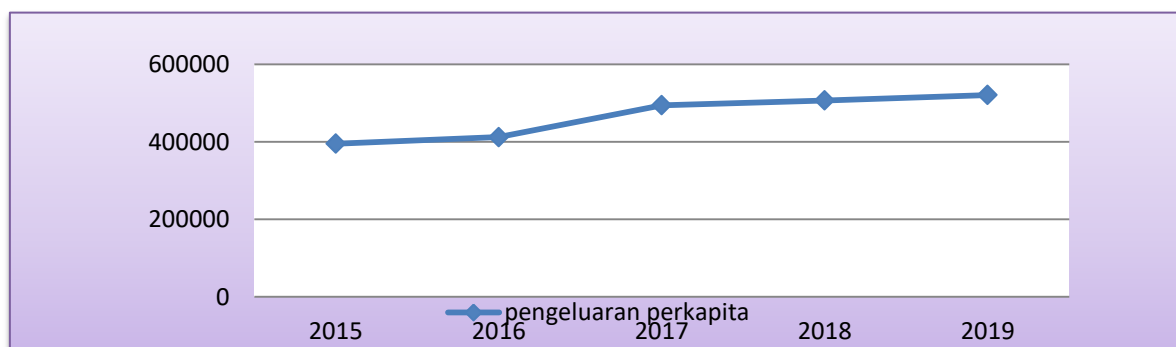**Population density graph in aceh province**

Source: Central Bureau of Statistics, 2020.

The graph of population density in the province of aceh in the last five years as illustrated in graph 1.2 above has increased every year. From 2015 it was 88 percent, and in 2017-2019 there was a fairly large increase of 95 percent. This is due to the high level of competition in the world of work, high birth rates, health, and disruption of security quality. The higher the population density, the higher the population density. also the poor, because the more population density has the potential to create a poor population. The population density in Aceh province from 2015-2019 has increased, theoretically the number of poor people will also increase. However, in reality the number of poor people in the province of Aceh continues to decline. With the increasing population density in Aceh Province, per capita expenditure will increase every year.

In addition to population density, another indicator that affects the poor is expenditure per capita. Per capita expenditure is the amount that is issued in cash by local governments both routinely which is then referred to as routine expenditure and capital expenditure (Gatot, 2013).

The following is a graph of per capita expenditure in Aceh province for the last five years:

Figure 1.3
Graph of Per capita Expenditure Level in Aceh Province

Source: Central Bureau of Statistics, 2020.

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Expenditure per capita in Aceh Province in the last five years, as illustrated in the graph above, has seen a continuous increase. Per capita expenditure in 2015 was 395136 rupiah and in 2019 there was an increase of 31% percent. This is caused by a decent standard of living, followed by an increase in the production of goods, and the large number of investments in capital-intensive projects, low household income is one of the reasons for household consumption. The link between per capita expenditure and poverty can be measured by comparing a person's consumption level with the poverty line or the amount of rupiah spent on food consumption per month (Kuncoro, 2006).

In addition to per capita expenditure, the open unemployment rate can also affect poverty in Aceh. Because the population has a very large dependence on salary or wage income, the loss of employment causes a large part of the income to be used to buy daily necessities. This causes a reduction in people's purchasing power, which means that the higher the unemployment, the higher poverty will be (Oktaviani, 2001).

The open unemployment rate in Aceh Province in the last 5 years can be seen in the picture below:

Figure 1.4
Graph of the Open Unemployment Rate in Aceh Province
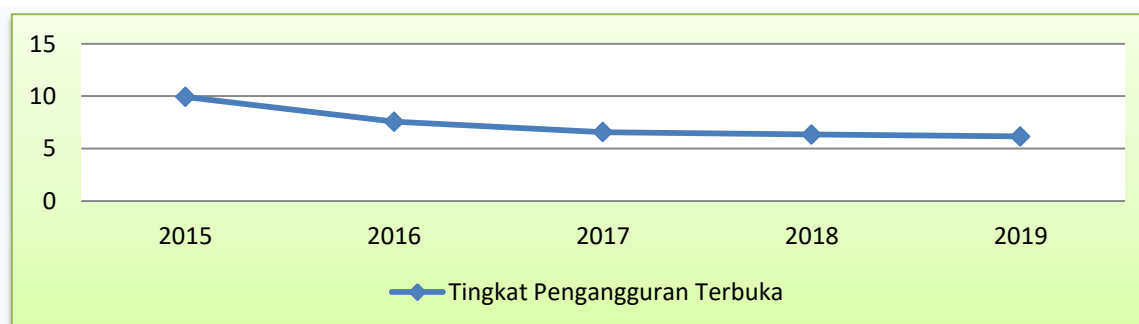
Source: Central Bureau of Statistics, 2020.

The open unemployment rate in Aceh Province for the last 5 years as depicted in graph 1.4 The open unemployment rate in Aceh Province from 2000-2019 has decreased every year. From 2015 it decreased by 9.93 percent until in 2019 it decreased by 6.17 percent. This is caused by a lack of incoming investment. The theory states that the open unemployment rate has a positive and significant effect on poverty, which means that the higher the unemployment rate, the poverty will increase (Astriani and Purbadharmaja, 2013).

1. THEORETICAL BASIS

Definition of Poverty

Poverty is a social problem that is always present in the midst of society, especially in developing countries. In the context of Indonesian society, the problem of poverty is also a social problem that is always relevant to be studied continuously. Not only because the

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problem of poverty has existed for a long time, but also because until now it has not been resolved and even now the symptoms are increasing in line with the multidimensional crisis that is still faced by the Indonesian people (Alfian, 2000 in A Mahendra, 2017).

Population density

Population density is the ratio between the total population and the area (Mantra, 2007). The population density data used is the rough population density which uses the administrative boundary area as the mapping unit boundary. The factors that will be analyzed in this study include population composition, accessibility and socio-economic conditions. Population composition describes the composition of the population based on population grouping according to the same characteristics (Pinem 2014).

Per capita Expenditure

Per capita expenditure is the cost incurred for the consumption of all household members, both food and non-food for a month divided by the number of household members. It can reveal general household consumption patterns. The composition of household expenditures can be used as a measure to assess the level of economic welfare of the population (BPS, 2017).

Definition of unemployment

Unemployment is a condition in which a person belonging to the labor force wants to get a job but has not been able to get it and someone who does not work, but is not actively looking for work is not classified as a bully (Sukirno, 2000).
Unemployment is a macroeconomic problem that directly affects human survival (Mankiw, 2003). For most people, losing a job is a decrease in a standard of living. So it is not surprising that unemployment is a topic that is often discussed in political debates by politicians who often study that the policies they offer will help create jobs.

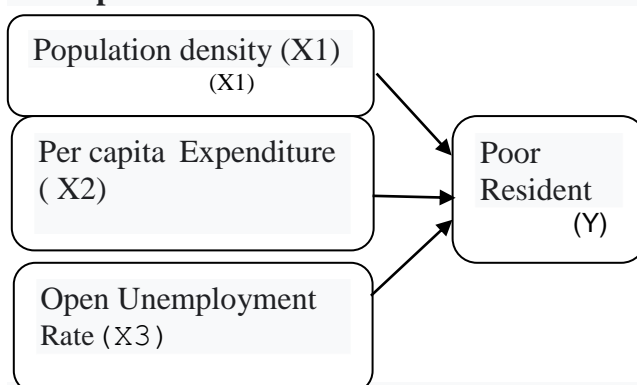**Conceptual framework**

Figure 2.3 Conceptual Framework

Relationship between Population Density and the Poor in Aceh Province

In general, the population density in developing countries is very high and the number is large, the population as a driver of development because a larger population is actually a potential market that becomes a source of demand for various kinds of goods and services

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which will then drive various kinds of economic activities so as to create economies of scale. which will aim to analyze the dominant factors that affect poverty from the results that benefit all parties, reduce production costs and create sources of supply or supply of cheap labor in sufficient quantities so that in turn it will stimulate higher output or aggregate production. Todaro and Smith, 2006).

Relationship of Per capita Expenditure with the Poor in Aceh Province

Research (Apriliyah, 2007). There are three dimensions of measuring the quality of human life, namely the first dimension of health, the second dimension of education and the third is a decent standard of living. In a broader scope, a decent standard of living describes the level of welfare enjoyed by the population as a result of the improving economy, the ability of people's purchasing power to a number of basic needs as seen from the average amount of per capita expenditure as an income approach that represents development achievements for a decent life. The level of welfare is said to increase if there is an increase in real per capita consumption, ie the nominal increase in household expenditure is higher than the inflation rate in the same period. This study shows that per capita consumption has a negative and significant effect on the number of poor people.

The Relationship between Unemployment and the Poor in Aceh Province.

According to (Sukirno, 2010), one of the important factors that determine the prosperity of a society is the level of income. Community income reaches its maximum if the full use of labor can be realized. Unemployment can reduce people's income, this can reduce the level of prosperity that can be achieved. From an individual point of view, unemployment can cause various economic and social problems. Lack of income causes the unemployed to reduce their consumption spending. If unemployment in a country is very bad, political and social chaos always prevails and has a bad effect on people's welfare and development prospects. economy in the long term. The decline in people's welfare due to unemployment will certainly increase their chances of being trapped in poverty because they have no income.

Research Hypothesis

Based on the theoretical basis and conceptual framework above, it can be concluded that the tentative assumptions or research hypotheses are as follows:

H1: It is assumed that population density has a positive effect on the poor in Aceh province in 2000-2019

H2: It is suspected that per capita expenditure has a negative and significant effect on the poor in Aceh province in 2000-2019

H3: It is assumed that the open unemployment rate has a positive effect on the poor in Aceh province in 2000-2019

2. RESEARCH METHODS

Research Objects and Locations

In this study, the object of research is the variable Population density, per capita expenditure variable, open unemployment rate variable, and poor population variable. The population density variable, per capita expenditure, and open unemployment rate as the

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dependent variable, and the poor population variable as the independent variable. The research location is in Aceh Province.

Types and Sources of Data

The type of data used is time series data obtained from the publications of the Indonesian Central Statistics Agency (BPS) and BPS Aceh from 2000-2019 (20 years)

Method of collecting data

The data used in this study is secondary data in the form of time series data for the period 2000 - 2019 totaling 20 years. In this study, the documentation method to find out data on population density, per capita expenditure, the open unemployment rate and the number of poor people in Aceh Province, was sourced from BPS Aceh. In addition to written report data, for the purposes of this research, various data, information and references from various library sources, mass media and internet were also explored.

Variable Operational Definition

Based on the theoretical basis, the authors use several operational definitions of variables as follows:

1. The Poor (Y). The poor are people who have not met their basic needs such as housing, food, education and have not had a per capita monthly expenditure below the poverty line, and have not had an adequate income. Expressed in (millions of people) and obtained from the Central Statistics Agency.

2. Population density (X1). Population density is the number of people in an area more than the area. Data on per capita income is expressed in percent (%). obtained from the Central Statistics Agency.

3. Per capita Expenditure (X2) . Per capita expenditure is all costs incurred for all household members. Expressed in (thousand rupiah) and obtained from the Central Statistics Agency.

4. The open unemployment rate (X3). The Open Unemployment Rate is the level of how many people who want to get a decent job and are trying to find work to fulfill their needs but they have not been able to get it, so they do not have income to meet their daily needs. Data The open unemployment rate is expressed in percent (%). Obtained from the Central Statistics Agency.

Data analysis method

This study was analyzed using a quantitative descriptive approach. The quantitative descriptive approach is the presentation and compilation of data into analyzed tables. The descriptive method aims to provide a description or description of the phenomenon or social phenomenon being studied (Yuliana, 2010). While the quantitative approach is to analyze the data obtained by using a model that is in accordance with the research.

Vector Autoregression (VAR)

Vector Autoregression (VAR) was first proposed by Sims (1980). VAR is usually used to analyze the relationship between a system of time series variables and to analyze the dynamic impact of disturbance factors contained in the system of variables. This approach is a modification or a combination of multivariate regression. and multivariate time series analysis of further tests related to time within or between other variables. Basically, VAR analysis can be compared with a simultaneous equation model because in

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this analysis it considers several endogenous (dependent/related) variables together in a model. Each variable in addition to being explained by other values in the past is also influenced by the past values of all other endogenous variables in the observed model. In addition, in the VAR analysis, there are usually no exogenous (independent/independent) variables in the model.

VAR has the advantage that it develops models simultaneously in a complex system (multivarite), so that it can capture the overall relationship of the variables in the equation. The detected relationships are direct and indirect. The VAR method can detect the relationship between variables in a system of equations, by making all variables endogenous. The VAR method works based on data so that it is free from various limitations of economic theory. With the VAR technique, only the relevant variables will be selected to be synchronized with the existing theory.

Stationerity Test

Stationarity test is very important in time series analysis. Stationarity testing is done by testing unit roots to test whether the time series data is stationary or not. Stationary data is time series data that does not contain unit roots (unit roots), on the other hand, non-stationary data if the mean, variance, and convariance of the data are constant over time (Prawoto & Basuki, 2016).

Optimal Lag Determination

The lag check is used to determine the optimal lag length that will be used in the subsequent analysis and will determine the parameter estimation for the VAR model. This is because the estimation of causality and the VAR model are very sensitive to lag length, so it is necessary to look at the data and then determine the determination of the lag length used (Widarjono, 2017).

Cointegration Test

Cointegration test is used to determine whether there will be a balance in the long term, namely by finding similarities in the movement and stability of a relationship between the variables in this study or not.

VAR . Stability Testing

VAR stability testing is carried out before conducting further analysis, because if the VAR estimation results combined with the error correction model are unstable, then the impulse response function (IRF) and forecasting error variance decomposition (FEVD) are invalid. Testing the stability of the VAR estimation that has been formed, then the VAR stability condition check is carried out in the form of roots of characteristic polynomial. A VAR system is said to be stable if all its roots have a modulus less than 1.

Granger Causality Test

The causality test is carried out to determine whether there is a relationship between endogenous (dependent) variables so that they can be treated as exogenous (independent) variables. The causality test in this study was carried out using the Granger's casuality method. previously it can show a causal relationship between variables over a long period of time. The method used to analyze the causal relationship between the observed variables is the Granger causality test. In this study the Granger causality relationship is used to see

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the direction of the relationship between population density variables, per capita expenditure and the open unemployment rate.

According to Gujarati (2003), a Granger equation can be interpreted as follows:

a. Unindirectional causality from the dependent variable to the independent variable. This happens because when the lag coefficient of the dependent variable is statistically significantly different from zero, while the lag coefficient of all independent variables is equal to zero.

b. Feedback/bilateral causality if the lag coefficient of all variables, both the dependent variable and the independent variable, is statistically significantly different from zero.

c. Independence if the lag coefficient of all variables, both dependent and independent variables is not statistically different from zero.

Decision making in the causality test is done by comparing the estimated t-statistical value with the t-table value or by looking at the F-statistical probability value. If the estimated t-statistic value is greater than the t-table value or the F-statistical probability value $< =5\%$, then H0 is rejected, meaning that there is an effect between the two variables being tested, and vice versa.

Estimasi *Vactor Autoregression* (VAR)

Model estimation in VAR is determined by stationary test and cointegration test, when stationarity test produces stationary data, the model is estimated using the VAR model, if it is not stationary at the level of the same degree (at the level) and cointegrated then differentiation and not cointegrated then the estimation model with differentiated VAR.

To estimate the VAR model, the length of lag is needed to see the relationship between other variables. The length of lag used when estimating the VAR model is to use a criterion, namely the Akaike Information Criterion (AIC), by selecting the estimation result with the smallest AIC value. Gujarati (2003), the lag length of the VAR model chosen is the lag length that has a minimum Akaike Information Criterion value. Widajono (2007), if we use one of the criteria in determining the length of inertia, the optimal length of inertia occurs if the values of the criteria above have the smallest absolute values.

Analisis *Impulse Response Fungction* (IRF)

VAR is a method that will determine its own dynamic structure of a model. After conducting the VAR test, it is necessary to have a method that can characterize the dynamic structure of the variable system in the observed model that reflects the innovation variable. One form of this test is IRF.

IRF shows how the response of each endogenous variable over time to shocks from itself and other endogenous variables. IRF also identifies a shock in one endogenous variable so that it can determine how an unexpected change in a variable affects other variables over time. IRF can be used to see the contemporary effect of a dependent variable if it gets a shock or invasion of the independent variable by a standard deviation. The results of the IRF are very sensitive to the ordering of the variables used in the calculations.

The sorting of variables based on Cholesky's factorization is done with a reserve of variables that have predictive values for other variables that are placed next to each other in front of each other. While the variables that do not have a predictive value for other variables are placed at the back, then the other variables are placed between the two variables based on the value of the correlation matrix which states the level of the greatest

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correlation. Ordering can also be done through the Granger causality test, where the order of variables is based on the variable that has the most significant influence on other variables.

In addition, IRF is also used to determine how long the effect of shock from one variable to another occurs. IRF also aims to isolate a shock to be more specific, meaning that other economic variables are only affected by the shock. If this is not done then the specific shock cannot be known and what can be known is the general shock.

3. RESEARCH RESULT

Analisis *Forecast Error Variance Decomposition* (FEVD)

FEVD can provide information on relatively more important variables in VAR. This model can be used to see how changes in a macro variable are shown by changes in the error variance that are influenced by other variables. This method can also characterize dynamic structures in the VAR model. This method can also show the strengths and weaknesses of each variable in influencing other variables over a long period of time (low long/how persistent).

The variance decomposition breaks down the forecast error into components that can be associated with each endogenous variable in the model. By calculating the percentage of squared prediction error to the next stage of a variable due to innovation in other variables, it can be seen how much error forecasting the variable is caused by the variable itself and other variables.

This test can be done to provide information about how the dynamic relationship between the variables analyzed. In addition, the FEVD is conducted to see how much random shocks from certain variables have on endogenous variables. FEVD produces information about the relative importance of each innovation. random (random innovation structural diturbance) or how strong the composition of the role of certain variables against others.

Stationarity Test

Stationarity test (Unit Root Test) is carried out to determine whether or not a variable is stationary. ADF (Augemented Dickey Fuller) analysis. If this test shows the ADF statistical value is greater than the Mackinnon Critical Value then the data is stationary, and conversely if the statistical ADF value is less than the Mackinnon Critical Value then the data is not stationary. Unit Root Test Results Aumented Dikley Fuller (ADF) can be seen in the following table:

Tabel 4.1
Uji Unit Root Test dengan *Augmented Dickey fuller* (ADF)

variabel	Unit Root	ADF Test Statistic	Critical Value 5%	Prob ADF	Keterangan
Jumlah Penduduk Miskin	level	-0.580904	-3.029970	0.8532	Tidak stasioner
	First Diff	-4.179508	-3.040391	0.0052	Stasioner
	SecoundDif	-6.295271	-3.052169	0.0001	Stasioner

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	f				
Kepada tan Pendud uk	level	-2.226038	-3.690814	0.4487	Tidak stasioner
	First Diff	-3.903445	-3.690814	0.0342	Stasioner
	SecoundDif f	-5.238654	-3.710482	0.0033	Stasioner
Pengelu aran perkapi ta	level	-1.661626	-3.673616	0.7281	Tidak stasioner
	First Diff	-4.275079	-3690814	0.0173	Stasioner
	SecoundDif f	-4.857218	-3.733200	0.0072	Stasioner
Tingkat Pengan gguran Terbuk a	level	-3.376263	-3.673616	0.0845	Tidak stasioner
	First Diff	-5.584334	-3.690814	0.0015	Stasioner
	Secound Diff	-7.387698	-3.710482	0.0001	Stasioner

Source: Processed Data(2021)

Based on table 4.1 above, it can be concluded that the variables of poverty, population density, per capita expenditure and the open unemployment rate are stationary at the first different and second different levels with constant regression (intercept) at the 1%, 5% and 10% levels.

Optimum Lag Determination
Based on the results of the optimum lag test that has been carried out on the variables in the study, the minimum AIC value is found in the lag as shown in the following table.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-355.82 15	NA	3. 31e+1 1	37.87 594	38.07 477	37.9095 9
1	-294.70 59	90.06 509*	3.01e +09*	33.12 693*	34.12 108*	33.2951 8*

Based on table 4.2 above the optimum lag value

Based on table 4.2 above, the optimum lag value is found in lag 1, where in this lag there are criteria of Like Ratio (LR) Final Predication Error (FPE), Akaike Information Creterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quin Information Creterion. (HQ). And if it is accumulated, the highest number of stars lies in lag 1, the selection of lag 1 is because the test results for the value of lag 1 are smaller than lag 0.

Granger Causality Test

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The Granger Causlity test is intended to determine whether there is a reciprocal relationship between variables (Masta, 2014). Then various references to determine the dependent variable in the study, but still

on rationality of thinking. The following is the Granger causality test in table 4.4

Table 4.3
Granger Causality Test

Pairwise Granger Causality Tests
Date: 06/24/21   Time: 08:44
Sample: 2000 2019
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
KEPADATAN_PENDUDUK does not Granger Cause PENDUDUK_MISKIN	19	3.6399 5	0.0745
PENDUDUK_MISKIN does not Granger Cause KEPADATAN_PENDUDUK		1.3179 2	0.2678
PENGELUARAN_PERKAPITA does not Granger Cause PENDUDUK_MISKIN	19	0.0360 5	0.8518
PENDUDUK_MISKIN does not Granger Cause PENGELUARAN_PERKAPITA		11.694 6	0.0035
TINGKAT_PENGANGGURAN_TER does not Granger Cause PENDUDUK_MISKIN	19	3.5368 7	0.0783
PENDUDUK_MISKIN does not Granger Cause TINGKAT_PENGANGGURAN_TER		3.9061 8	0.0656
PENGELUARAN_PERKAPITA does not Granger Cause KEPADATAN_PENDUDUK	19	0.2487 3	0.6248
KEPADATAN_PENDUDUK does not Granger Cause PENGELUARAN_PERKAPITA		9.9160 5	0.0062
TINGKAT_PENGANGGURAN_TER does not Granger Cause KEPADATAN_PENDUDUK	19	0.0831 4	0.7768
KEPADATAN_PENDUDUK does not		7.3	0.01

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Granger Cause TINGKAT_PENGANGGURAN_TER	632 8	53
TINGKAT_PENGANGGURAN_TER does not Granger Cause PENGELUARAN_PERKAPITA	0.6 615 19 6	0.42 79
PENGELUARAN_PERKAPITA does not Granger Cause TINGKAT_PENGANGGURAN_TER	6.0 013 1	0.02 62

Source: Processed data (2021).

Based on table 4.3, it can be seen that the population density variable does not have a causal relationship but is in the same direction as poverty and vice versa, poverty also does not have a causal relationship with population density, as evidenced by the Granger probability value greater than the 0.05 (5%) confidence level, which is equal to $0.0745 > 0.05$ and $0.2678 > 0.05$.

The expenditure variable per capita has no causal relationship to the number of poor people, namely $0.8518 > 0.05$. In contrast to the poverty variable which has a causal relationship to per capita expenditure, it is $0.0035 < 0.05$.

The variable open unemployment rate does not have a causal relationship but is in the direction of poverty, namely $0.0783 > 0.05$, the same as the poverty variable which does not have a causal relationship to the open unemployment rate, which is $0.0656 > 0.05$.

Expenditure variable per capita which does not have a causal relationship to population density is $0.6248 > 0.05$, the same as the variable population density which has no causal relationship and is not in the same direction as per capita expenditure, which is $0.0062 < 0.05$.

The variable of the open unemployment rate which has no causal relationship to population density is $0.7768 > 0.05$, in contrast to the variable population density which has a causal relationship to the open unemployment rate, which is $0.0153 < 0.05$.

Variable The open unemployment rate which has a causal relationship to per capita expenditure is with a probability value of $0.0312 < 0.05$. In contrast, per capita expenditure does not have a causal relationship to the open unemployment rate, which is $0.1014 > 0.05$.

Johansen's . Cointegration Test

Cointegration test is carried out to see whether there is a long-term or short-term relationship and the possibility of an imbalance. With this imbalance, an error correction model is needed. The following is a Johansen's cointegration test table, which is as follows:

Table 4.4
Johansen's . Cointegration Test

Date: 07/04/21 Time: 08:53
Sample (adjusted): 2002 2019
Included observations: 18 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: PENDUDUK_MISKIN   KEPADATAN_PENDUDUK

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PENGELUARAN_PERKAPITA TINGKAT_PENGANGGURAN_TERBUKA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.943337	112.9315	63.87610	0.0000
At most 1 *	0.815032	61.26004	42.91525	0.0003
At most 2 *	0.720939	30.88377	25.87211	0.0109
At most 3	0.355604	7.909942	12.51798	0.2591

 Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.943337	51.67144	32.11832	0.0001
At most 1 *	0.815032	30.37627	25.82321	0.0117
At most 2 *	0.720939	22.97383	19.38704	0.0144
At most 3	0.355604	7.909942	12.51798	0.2591

Source: Processed data (2021).

From table 4.4 it can be seen that not all of the trace statistic values are greater than the critical value of 5%. At At most 3 the trace statistic value < critical value or 7.909942 < 12.51798 so it is said not to be cointegrated in At most 3. only At most 1 and 2 are cointegrated. therefore the vecm model cannot be used (widarjono). So it can be concluded that between the variables in this study there is a relationship between long-term balance stability and temporary movement in the short term. All research variables adjust to each other to achieve long-term balance.

Vector Autoregression (VAR) Stability Testing
    VAR Stability Testing is carried out before conducting further analysis, because if the VAR estimation results using the error correction model are unstable, the impulse Response Function (IRF) and Forecasting Error Variance Decomposition (FEVD) will be invalid. It can be seen in the following table:

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Tabel 4.5
Stability Condition Check

Roots of Characteristic Polynomial

Endogenous variables: D(PENDUDUK_MIS
KIN) D(KEPADATAN_PENDUDUK)
D(PENGELUARAN_PERKAPITA)
D(TINGKAT_PENGANGGURAN_TERBU
KA)

Exogenous variables: C

Lag specification: 1 1

Date: 07/04/21   Time: 14:45

Root	Modulus
-0.002301 - 0.383645i	0.383652
-0.002301 + 0.383645i	0.383652
0.329065	0.329065
0.009096	0.009096

No root lies outside the unit circle.

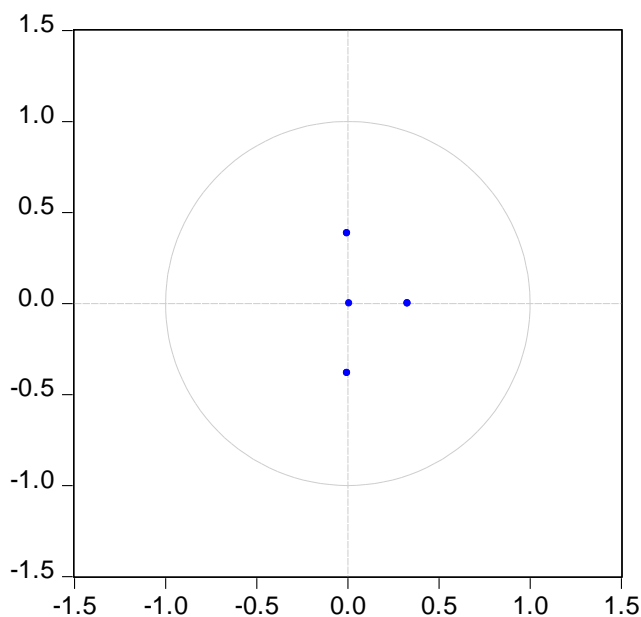Inverse Roots of AR Characteristic Polynomial

Figure 4.6 VAR Stability

Based on the results of the Vector Autoregression stability test in table 4.5, it shows that the VAR equation has a modulus value of less than one. In the picture above, all of the

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inverse roots polynomial points are on a circle. This means that it can be concluded that the VAR model formed is stable.

VAR Vector Autoregression Estimation Results

Vector Autoregretion (VAR) estimation is carried out to determine a good model and in a series to determine a projection on economic conditions, where the results taken are based on a significant level of fault tolerance, namely by comparing t count with t table (1.74588). Vector Autoregression (VAR).

Table 4.7
Vector Autoregression Estimation Results

Vector Autoregression Estimates
Date: 07/04/21   Time: 08:55
Sample (adjusted): 2002 2019
Included observations: 18 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	D(PENDUDUK_MISKIN)	D(KEPADATAN_PENDUDUK)	D(PENGELUARAN_PERKAPITA)	D(TINGKAT_PENGANGGURAN_TERBUKA)
D(PENDUDUK_MISKIN(-1))	0.191785	-0.029032	-16569.12	-0.250395
	(0.20602)	(0.22197)	(4778.42)	(0.33177)
	[0.93090]	[-0.13079]	[-3.46749]	[-0.75472]
D(KEPADATAN_PENDUDUK(-1))	-0.107143	0.373562	4485.064	-0.343913
	(0.23910)	(0.25762)	(5545.78)	(0.38505)
	[-0.44810]	[1.45006]	[0.80873]	[-0.89316]
D(PENGELUARAN_PERKAPITA(-1))	2.57E-06	-6.25E-07	0.083467	7.86E-07
	(8.3E-06)	(8.9E-06)	(0.19142)	(1.3E-05)
	[0.31081]	[-0.07034]	[0.43605]	[0.05913]
D(TINGKAT_PENGANGGURAN_TERBUKA(-1))	0.607520	0.125701	4083.709	-0.315255
	(0.16610)	(0.17897)	(3852.61)	(0.26749)
	[3.65747]	[0.70238]	[1.05999]	[-1.17856]

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C	-0.489340	0.761372	888.2955	0.204041
	(0.48592)	(0.52355)	(11270.5)	(0.78252)
	[-1.00704]	[1.45426]	[0.07882]	[0.26075]

Source: Processed data (2021)

Based on table 4.6 above, it can be concluded that population density does not have a significant positive effect on poverty, as evidenced by the t-statistic value is smaller than t-table, namely -0.44810 < 1.74588. In contrast to the per capita expenditure variable which has a positive but not significant effect on poverty, as evidenced by the value of t-statistics is smaller than t-table, namely 0.31081 < 1.74588. While the open unemployment rate variable has a positive and significant effect on poverty, as evidenced by the t-statistic value greater than t-table, namely 3.657471 > 1.74588 during the study period. So it can be concluded that the population density variable has no significant effect on poverty.

Impulse Response Function (IRF)
Impulse response analysis was carried out to track the response of endogenous variables in the VAR system due to shock or changes in disturbance variables. In other words, to see how long or the variable returns to normal after a shock occurs due to another variable. Following are the results of the impulse response.
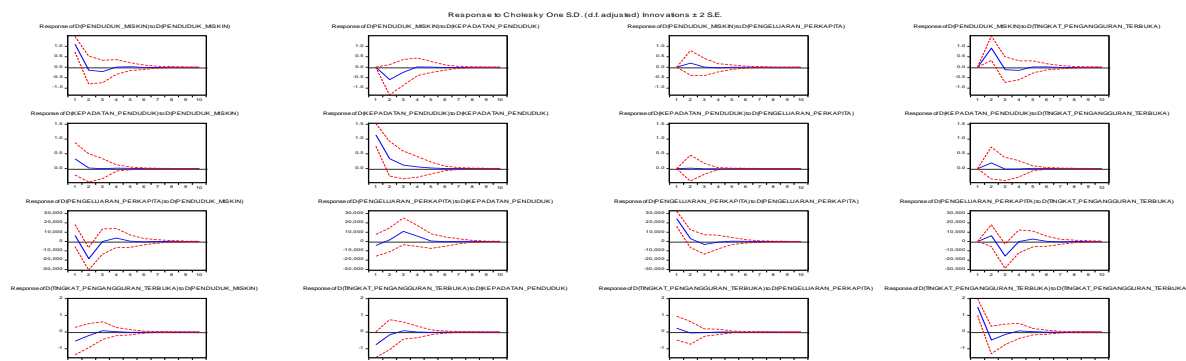

Figure 4.7 Impulse Response

The picture above shows the response of population density to the shocks of the poor. The shocks that occurred in the first quarter to the tenth quarter are below the horizontal line and show a negative response. This means that during a certain quarter when population density decreases, the poor also decreases.

The picture above shows the response of per capita expenditure to the poor. The shocks that occurred in the first quarter up to the 10th quarter were above the horizontal line and showed a positive response. This means that during a certain quarter when per capita expenditure decreases, the poor will also decline.

The picture above shows the response of the open unemployment rate to the poor. The shocks that occurred in the first quarter to the tenth quarter were above the horizontal line and showed a positive response, meaning that during a certain quarter when the open unemployment rate decreased, poverty would also decrease.

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Analysis of Variance Decomposition

Analysis of Variance Decomposition describes the relative importance of each variable in the VAR system due to shock. Variance Decomposition is also very useful for predicting the contribution of each variable due to changes in variables in the VAR system (Masta, 2014). The contribution of variance decomposition in the study is as follows.

Table 4.8
Variance Decomposition of Poverty

Variance Decomposition of D(PENDUDUK_MISKIN):					
Period	S.E.	D(PENDUDUK_ MISKIN)	D(KEPADATAN_ PENDUDUK)	D(PENGELUARAN_PERK APITA)	D(TINGKAT_PENGA NGGURAN_TERBUK A)
1	1.105794	100.0000	0.000000	0.000000	0.000000
2	1.570147	50.33882	14.26331	1.626679	33.77119
3	1.606281	49.74823	15.89007	1.560844	32.80085
4	1.613207	49.32547	15.76894	1.574654	33.33094
5	1.613543	49.33215	15.76885	1.574025	33.32497
6	1.613710	49.32223	15.76971	1.574387	33.33367
7	1.613724	49.32212	15.77016	1.574362	33.33336
8	1.613727	49.32192	15.77012	1.574369	33.33360
9	1.613727	49.32192	15.77012	1.574369	33.33359
10	1.613727	49.32192	15.77012	1.574369	33.33360

Source: Processed Data (2021)

From Table 4.7, it can be seen that initially the variable of the poor population in the first year was still strongly influenced by the population itself. This can be seen from the amount of the contribution, which is 100 percent. Where other variables have not given a shock to the number of poor people. However, in the third year in the short term, other variables in the study began to have an effect even though the portion was still very small, namely the population density variable of 15.89% percent, the per capita expenditure variable of 1.56% percent, and the open unemployment rate of 32.80 % percent.

In the long term, in the 10th year, the contribution to the number of poor people still affects the variable of the number of poor people themselves, which is 49.3% percent, population density is 15.7%, per capita expenditure is 17.9% percent, and the open unemployment rate is 33.3% percent. This indicates that during the period of this study, it is explained that the variable that affects the number of poor people is the variable number of poor people themselves. And the influence of other variables has not contributed much.

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Table 4.8
Variance Decomposition Population Density

Variance Decomposition of D(KEPADATAN_PENDUDUK):

Period	S.E.	D(PENDUDUK_MISKIN)	D(KEPADATAN_PENDUDUK)	D(PENGELUARAN_PERKAPITA)	D(TINGKAT_PENGANGGURAN_TERBUKA)
1	1.191416	7.691343	92.30866	0.000000	0.000000
2	1.252188	6.987032	90.72875	0.010979	2.273242
3	1.258252	6.921010	90.78768	0.016354	2.274957
4	1.259661	6.918901	90.78401	0.018861	2.278224
5	1.259818	6.919690	90.77932	0.018857	2.282129
6	1.259827	6.919597	90.77868	0.018869	2.282858
7	1.259828	6.919593	90.77865	0.018871	2.282882
8	1.259828	6.919593	90.77865	0.018872	2.282887
9	1.259828	6.919594	90.77865	0.018872	2.282889
10	1.259828	6.919594	90.77865	0.018872	2.282889

From Table 4.8, it can be seen that initially the population density variable in the first year was still strongly influenced by the total population density itself. This can be seen from the amount of the contribution, which is 92.3% percent. Where other variables did not give a shock to population density at all. Only the poor population variable is 7.6%. However, in the third year in the short term, other variables in the study began to have an influence where the variable population density itself was 90.7%, and another variable that influenced the number of poor people was 6.9%. The variable per capita expenditure is 0.0%, and the open unemployment rate is 2.2 percent.

In the long term, in the 10th year, the contribution to population density still affects the population density itself, which is 90.7 percent, the variable number of poor people is 6.9 percent, per capita expenditure is 0.0 percent, and then the open unemployment rate is 2, 2 percent. This indicates that during the period of this study, it is explained that the variables that affect population density in the short and long term are influenced by the variables that have the greatest contribution, namely the variable population density itself and the variable poor population.

Table 4.9
Variance Decomposition of Per capita Expenditure

Variance Decomposition of D(PENGELUARAN_PERKAPITA):

Period	S.E.	D(PENDUDUK_MISKIN)	D(KEPADATAN_PENDUDUK)	D(PENGELUARAN_PERKAPITA)	D(TINGKAT_PENGANGGURAN_TERBUKA)
1	25647.76	6.169569	2.657609	91.17282	0.000000
2	32401.80	36.51380	1.938932	57.96402	3.583248
3	37732.01	26.92690	9.657320	43.47433	19.94145
4	38361.05	26.99067	11.62547	42.09099	19.29287
5	38456.68	26.86400	11.57913	41.89229	19.66458
6	38459.82	26.87264	11.57959	41.88576	19.66200
7	38461.83	26.86984	11.58012	41.88169	19.66836

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8	38462.04	26.86995	11.58066	41.88125	19.66815
9	38462.08	26.86989	11.58063	41.88116	19.66831
10	38462.08	26.86989	11.58063	41.88116	19.66831

Source: Processed Data (2021)

From Table 4.9, it can be seen that initially the Per capita Expenditure variable in the first year was still strongly influenced by the amount of Per capita Expenditure itself. This can be seen from the amount of the contribution, which is 91.1 percent. Where other variables have not given a shock to per capita expenditure at all. Only variable poor population is 6.1 percent and population density variable is 2.6 percent. However, in the third year in the short term, other variables in the study began to have an influence where the per capita expenditure variable alone contributed 43.4 percent, and another variable that influenced the number of poor people was 26.9 percent. The population density variable is 9.6 percent, and then the open unemployment rate is 19.9 percent.

In the long term in the 10th year the contribution to Per capita Expenditure still affects Per capita Expenditure itself, which is 41.8 percent, the variable number of poor people is 26.8 percent, population density is 11.5 percent, and then the open unemployment rate is 19. 6 percent. This indicates that during the period of this study, it is explained that the variable that affects per capita expenditure is the per capita expenditure variable itself. And the influence of other variables has not contributed much.

Variance Decomposition of Open Unemployment Rate

Variance Decomposition of D(TINGKAT_PENGANGGURAN_TERBUKA):

Period	S.E.	D(PENDUDUK_MISKIN)	D(KEPADATAN_PENDUDUK)	D(PENGELUARAN_PERKAPITA)	D(TINGKAT_PENGANGGURAN_TERBUKA)
1	1.780755	9.198687	18.05002	1.613995	71.13730
2	1.862641	9.743085	17.22148	1.553364	71.48208
3	1.871829	9.832377	17.25668	1.574950	71.33599
4	1.873273	9.839059	17.23010	1.574699	71.35614
5	1.873530	9.841319	17.23667	1.575148	71.34686
6	1.873566	9.841495	17.23618	1.575129	71.34720
7	1.873571	9.841543	17.23622	1.575139	71.34710
8	1.873571	9.841546	17.23621	1.575139	71.34711
9	1.873572	9.841547	17.23621	1.575139	71.34710
10	1.873572	9.841547	17.23621	1.575139	71.34710

Source: Processed data (2021)

From Table 4.10 it can be seen that the contribution of the variable to the open unemployment rate is 71.1 percent, the poor is 9.1 percent, the population density is 18.0 percent, and the per capita expenditure is 1.6 percent. However, in the third period, in the short term, the open unemployment rate contributed 71.3 percent, while the poor contributed 9.8 percent. The per capita expenditure variable is 1.5 percent. In the long term in the 10th period, the open unemployment rate is 71.3 percent, the variable number of poor people is 9.8 percent, and per capita expenditure is 1.5 percent. So the variance descomposition of per capita expenditure is the most dominant contribution of other variables, so that per capita income is still the factor that most influences the open unemployment rate.

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From this explanation, it can be seen that the variables of population density, per capita expenditure and the open unemployment rate in this study tend to have a greater contribution than the variable number of poor people. Then expenditure per capita is the variable with the most dominant contribution compared to other variables in this study.

5. CLOSING
Conclusion
Based on the results of research conducted using the Vector Autoregression (VAR) method, the conclusions in this study according to the problem formulation can be concluded as follows:
1. By using the Vector Autoregression (VAR) model, it can be concluded that the population density variable has no positive and significant effect on the poor in Aceh province. The results of this study are not in accordance with the theory.
2. From the results that have been processed using the Vector Autoregression (VAR) model, it proves that the per capita expenditure variable has a positive but not significant effect on the poor in Aceh Province. This is not in accordance with the theory.
3. Based on the results using the VAR model, it is identified that the open unemployment rate variable has a positive and significant effect on the poor in Aceh Province. This is in accordance with the theory.

Sugestion
1. Based on the results of data processing in this study, several suggestions can be given, namely:
2. There needs to be attention from the government such as lowering the price of goods on per capita expenditure. The government is also expected to be able to open up jobs for the community and implement policies that can encourage people to be able to become independent entrepreneurs so that they can alleviate poverty, so that per capita income increases. and can create job opportunities for the local community. In carrying out economic activities, per capita expenditure and the open unemployment rate are very important things to pay attention to so that people are more prosperous and the number of poor people can decrease.
3. To reduce the unemployment rate, it is hoped that the government will conduct job training so that superior human resources can be created and can compete with foreign countries, improve the micro-enterprise sector, limit foreign workers who want to work in Aceh by prioritizing and facilitating employment opportunities for residents. Indonesia itself. It is hoped that further research will be able to obtain better results in explaining the variable number of poor people using different research methods.
4. It is necessary to increase human resources in order to reduce poverty

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