

THE EFFECT OF POPULATION, GRDP, AND INVESTMENT ON LABOR ABSORPTION IN NORTH SULAWESI PROVINCE

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Abstract

This research aims to determine the effect of Population, Gross Regional Domestic Product (GRDP), and Investment on employment in the short and long term in North Sulawesi Province. The data used are times series data from 2001-2021 sourced from BPS. The method used in this article is Error Correction Model (ECM). The results revealed that the population has a positive and insignificant effect on employment in the short term, while in the long term it has a positive and significant effect on employment, GRDP has a positive and insignificant effect on employment in the short term, while in the long term it has a negative and insignificant effect on employment, investment has a positive and significant impact on employment in the short term, while in the long term investment has a positive and significant impact on employment.

Keywords: GRDP, Investment, Labor Absorption, Population

1. INTRODUCTION

Basically every country in the world, be it a developed country or a developing country, must have problems that must be faced in carrying out economic activities, including Indonesia, which is a developing country which has various economic problems, especially in terms of economic development. For developing countries, economic development in general has the aim of creating equitable development across all levels of society, expanding employment opportunities, creating an increase in the rate of economic growth, equitable distribution of income, and a balanced economic structure (Sutrisno, 2021). So it can be said that the workforce is included in the most important factor in encouraging the success of economic development so that good and quality economic growth can be achieved.

Where in this case the creation of broad job opportunities or the absorption of a large workforce can be one of the factors driving equitable economic development. However, employment problems in developing countries are still a complex problem in the economy in various provinces in Indonesia. In North Sulawesi, the problem of employment is also not a new thing if it is associated with the high number of unemployed, according to data Central Bureau of Statistics (2021) which shows data that North Sulawesi Province occupies the fifth position as the province with the highest Open Unemployment Rate (OUR) at 7,06% in August 2021. This position is said to be quite dangerous because if the unemployment problem is not immediately addressed because it can cause other economic problems such as poverty and crime in the long term. From this it can be said that the government's policy in dealing with employment problems, especially in terms of employment is still less than optimal in North Sulawesi Province.

The amount of labor absorption in an area can be supported by population growth, because it is the population that becomes the workforce. So that if there is an increase in

the population of an area, the workforce owned also increases in the area, but it must be noted that if this is not balanced with an increasing number of jobs, it will cause various population problems that are increasingly complex, for example, unemployment. Because of the increasing population growth rate, the working age population will also grow faster in the labor market, so it needs to be followed by a wider absorption of labor. This is in accordance with Fachreza (2018) which states that the population has an influence on the absorption of labor, meaning that when the population increases, the absorption of labor also increases.

In addition to the population, Gross Regional Domestic Product (GRDP) and employment also have a relationship from the contribution of each sector in producing output, which is indicated by the value of GRDP which has increased every year, where the added value of goods and services produced by the workers in certain sectors can be known through the value of the GRDP. From the high output produced, it will move the company in increasing the demand for labor with the aim of being able to offset the increase in sales of goods or services produced (Feriyanto, 2014). Likewise, Ziyadaturrofiqoh, Zulfanetti, and Safri (2018) also highlight that GRDP has an influence on employment.

Absorption of labor can also be affected by investment, be it Foreign Investment (hereinafter referred to as PMA) or Domestic Investment (hereinafter referred to as PMDN), because investment or investment is an important factor used as a driving force for economic development of a region in an effort to increase labor productivity to increase labor productivity. production capacity of goods or services. According to Sukirno (2000) the existence of investment activities will cause the community to continue to increase economic activities and job opportunities, increase income and level of welfare. This statement was put forward by research Romdhoni (2017) states that investment has an influence on employment, when the investment given to an area is high, it is likely that the absorption of the existing workforce will also be greater.

From the background above, this study aims to determine the effect of population on labor absorption in North Sulawesi Province, examine the effect of gross regional domestic product on employment in North Sulawesi Province, and reveal the effect of investment on labor absorption in North Sulawesi Province. North Sulawesi Province. The researcher uses the Engle Granger-Error Correction Model approach to determine whether there is a short-term relationship between the variables used with the Eviews 10 program analysis tool. Several previous studies only focused on seeing how the effect in the long term was using the multiple linear regression analysis method. Therefore, this study intends to find out whether there is a short-term relationship between the variables used with the ECM-EG right method that distinguishes this study from previous studies. Another difference is in the independent variables and the period used, where this study contains a novelty period from 2001-2021.

2. LITERATURE REVIEW

2.1. Employment

Labor absorption refers to the number of jobs that have been filled, which can be seen from the size of the workforce. The absorption of labor occurs because of the demand for labor, so that the absorption of labor can be said to be a demand for labor (Kuncoro, 2002). According to Suparmoko (2002) labor is the population who are of working age or the entire population who carry out production activities of a good and service in a

country. Meanwhile, absorption of manpower can be defined as a situation where there are wide employment opportunities for job seekers or a situation where workers have been accepted to do tasks that are in accordance with the provisions as they should be (Todaro, 2000).

According to Law No. 13 of 2003 which discusses employment, defines labor as someone who is able to do a job that is ultimately able to produce goods and services (output) that are useful in terms of meeting individual or group needs. Employment absorption is still related to job opportunities which have the meaning of the number of job vacancies that can be accepted by a field of work to create certain outputs.

2.2. Total population

According to Central Bureau of Statistics (2022) Regarding the definition of population, it is all humans who reside in the geographical area of the State of Indonesia for approximately 6 months or more and or those who reside for less than 6 months who have a permanent purpose. So that the population is defined as the number of people who occupy a place either from within the country or abroad. The population is the most important component in the absorption of labor, from the high growth of the population it affects the increase in the number of workers. According to Arsyad (1988) HR is the right resource to rely on because when the population increases, the absorption rate of labor also increases. The higher the population causes an increase in the number of the workforce, so that with the limited job opportunities, there will be fewer job opportunities and competition for jobs becomes increasingly difficult (Feriyanto, 2014).

2.2.1. Population Growth Theory

According to Adam Smith's theory which assumes that the population is a potential input that can be a factor in increasing production in the company, so that the higher the population will result in the large number of workers that can be used.

2.2.2. Population Theory Michael Kremer

According to Michael, the growth in population has an influence on technology, which means that from an increase in population, more people are creating new technologies and innovations. This is what is able to affect the absorption of labor because a company is able to use these new findings to increase production output.

2.2.3. Gross Regional Domestic Product (GRDP)

According to Central Bureau of Statistics (2022) GRDP is defined as the amount of gross added value that can be produced from a business unit in a domestic area or the total value of goods/services which is the result of all economic activities of a region within a certain period. According to Simanjuntak (1998) the creation of a demand for labor depends on the ability of a company to create goods and services through production activities, so that the amount of contribution from GRDP received has an influence on increasing employment. Because GRDP is calculated in the form of added value which is the result of several economic sectors, so that it indirectly affects the absorption of labor in certain sectors that have high productivity in creating output.

2.3. Investation

Investment according to Sukirno (2004) is an expenditure used to purchase capital goods and tools that are useful for the production process, this is done with the aim of increasing the ability to produce and most importantly making additions to capital goods used in the production process of goods or services in the future. According to Law No. 25 of 2007 investment can be grouped into two types of capital status, namely, Domestic Investment (DI) is an investment activity for businesses in the territory of the Republic of Indonesia carried out by domestic investors with domestic capital. Meanwhile, Foreign Investment (FI) is an investment activity for business ventures in the territory of the Republic of Indonesia which is carried out by foreign investors entirely or shared with domestic investors. So that it can be said that investment itself aims to increase production output so that it will eventually create a higher output or surplus. That way, job opportunities have increased so that they can absorb the existing workforce.

According to Sukirno (2000) the existence of investment activities will cause the community to continue to increase economic activities and job opportunities, increase income and the level of community prosperity. So that the investment is able to become a driving factor in creating the latest and newest capital goods, so from this it can absorb more modern production factors so that in the end it can create jobs which in turn can absorb labor so as to reduce unemployment (Prasojo, 2009).

3. RESEARCH METHODS

3.1. Data Types and Sources

The data used in this study is secondary data with the type of time series data starting from 2001-2021 which is sourced from reports from official government institutions, namely the Central Statistics Agency (CSA) of North Sulawesi Province and relevant documents that support in research writing. The dependent variable used is the number of working residents to show employment absorption data, then the independent variables used include: Total Population, Gross Regional Domestic Product (GRDP), and Investment in North Sulawesi Province.

3.2. Data Analysis Method

The data analysis method used in this study is the Error Correction Model (ECM) analysis method or error correction model where this model is used to determine and correct whether there is an imbalance between the short-term and long-term balance test results between the dependent variable (Y) and the independent variable (X) which is processed using the software program Eviews 10. The data analysis technique used in this research is descriptive quantitative which is a way of explaining the results of research with existing theories related to elaboration with quantitative data in the form of statistical figures, then conclusions are drawn by outlining or describe the data as it is described.

The basic equations used are the Error Correction Model (ECM) method by Engle-Granger:

$$LA = f (TP, GRDP, INV)$$

Information:

LA : Labor Absorption

TP : Total population
GRDP : Gross Regional Domestic Product
INV : Investment (Foreign Investment and Domestic Investment)

The following is the equation of the model in the long run:

$$LA_t = \beta_0 + \beta_1 TP_t + \beta_2 GRDP_t + \beta_3 INV_t + e_t$$

The model equation in the short term:

$$DPTK_t = \alpha_0 + \alpha_1 DJP_t + \alpha_2 DPDRB_t + \alpha_3 DINV_t + \alpha_4 ECT_{t-1} + e_t$$

Information:

DLA : Changes in Labor Absorption
DTP : Total Population Change
DGRDP : Changes in Gross Regional Domestic Product
DINV : Investment Change
 $\beta_1, \beta_2, \beta_3$: Long-term regression coefficient of each independent variable
 $\alpha_1, \alpha_2, \alpha_3$: Short-term regression coefficient of each independent variable
 α_4 : Unbalance correction regression coefficient (ECT)
 ECT_{t-1} : Residual long run equation in period t-1
 e : Error Term

Before using the Error Correction Model (ECM) method, there are several tests that must be observed so that the data used can reach a stationary level at a level level. The following are some of the tests that researchers must carry out:

1) Stationarity Test

This stationarity test was carried out to avoid a spurious regression, in this study the researcher used the Augmented Dickey-Fuller test in testing the stationary level of the data.

2) Cointegration Test

Then the next is the cointegration test which is useful for identifying whether there is a long-term relationship between the variables used. Because the method used is ECM, so this test is carried out by regressing the long-term equation, then by looking at the results of the residual calculation whether it is stationary at the level.

3) Error Correction Model (ECM) Test

Error Correction Model (ECM) which can also be called the error correction model where in this model is used to find out and correct whether there is an imbalance between the short-term and long-term balance test results between the dependent variable (Y) and the independent variable (X).

4) Classic Assumption Test

- a) Normality test, through this test it can be seen whether the observed variable data is normally distributed or not, with the test Jarque-Bera (JB).
- b) Multicollinearity test, this test aims to determine whether among the independent variables used there is a high correlation or correlation or not.
- c) Heteroscedasticity test, which in this test aims to identify whether or not there is a heteroscedasticity problem seen from the residual variance of observations with the Breusch test.

- d) Autocorrelation test, in this test it can be seen how the level of residual relationship between the independent variables in linear regression with the Breusch test is seen from the Prob value. Chi-Square.

4. RESULTS AND DISCUSSION

4.1. Research result

4.1.1. Stationary Test

Table 1. Stationarity Test At Level

Variable	ADF value	MacKinnon Critical Value			Prob.	Note.
		1%	5%	10%		
CAR	-0.422353	-3831511	-3029970	-2655194	0.8864	Not Stationary
JP	0.314388	-3808546	-3020686	-2650413	0.9729	Not Stationary
GDP	-0.168219	-3808546	-3020686	-2650413	0.9282	Not Stationary
INV	0.402693	-3857386	-3040391	-2660551	0.9771	Not Stationary

Source: Eviews 10 (Data processed)

Based on table 1, showing the results of the stationarity test at the level level, it can be said that the probability value of each variable showing a value greater than $\alpha = 5\%$. Because it does not meet the assumption of stationarity at the zero degree level or $I(0)$, then all variables will be tested at the degree of integration at the first difference level.

Table 2. Stationarity Test at First Difference Level

Variable	ADF value	MacKinnon Critical Value			Prob.	Note.
		1%	5%	10%		
CAR	-7,242.274	-3.831511	-3.029970	-2.655194	0.0000	Stationary
JP	-4.945.960	-3.831511	-3.029970	-2.655194	0.0010	Stationary
GDP	-4,300,084	-3.831511	-3.029970	-2.655194	0.0038	Stationary
INV	-5,797,078	-3.857386	-3.040391	-2.660551	0.0002	Stationary

Source: Eviews 10 (Data processed)

Based on table 2, the results of the stationarity test at the first difference level can be seen from the probability value of each variable which shows a value of less than $\alpha = 5\%$. So that it can be concluded that it has fulfilled the stationarity assumption at the first difference or $I(1)$ level, it can proceed to the next test, namely the cointegration test.

4.1.2. Cointegration Test

Table 3. Cointegration Test

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistics	-3.898035	0.0083
Test critical values:		
	1% level	-3.808546
	5% level	-3.020686
	10% level	-2.650413

Source: Eviews 10 (Data processed)

Based on table 3 above, it can be seen that the cointegration test results show that the dependent and independent variables are cointegrated with each other at the level level. This can be seen from the probability value which shows $0.0083 < 0.05$ or smaller than $\alpha = 5\%$ so that it can be concluded that there is a long-term relationship between the variables.

4.1.3. Error Correction Model (ECM) Test

Table 4. Short-Term ECM Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8096.557	9710.087	0.833829	0.4175
D(JP)	0.242981	0.238821	1.017415	0.3251
D(GDP)	0.000269	0.000915	0.294092	0.7727
D(INV)	12.91249	3.131132	4.123906	0.0009
ECT (-1)	-1.009704	0.276650	-3.649752	0.0024
R-squared	0.713654	Mean dependent var		17040.20
Adjusted R-squared	0.637296	SD dependent var		43451.65
SE of regression	26168.73	Akaike info criterion		23.39484
Sum squared resid	1.03E+10	Schwarz criterion		23.64377
Likelihood logs	-228.9484	Hannan Quinn Criter.		23.44343
F-Statistics	9.346067	Durbin-Watson stat		2.011805
Prob(F-statistic)	0.000537			

Source: Eviews 10 (Data processed)

The probability value of the population variable is $0.3251 > 0.05$ exceeding $\alpha = 5\%$, which means that the population has a positive and insignificant effect on short-term employment. In the GRDP variable, the probability value of $0.7727 > 0.05$ exceeding $\alpha = 5\%$ means that GRDP has a positive and insignificant effect on short-term employment. The investment variable with a probability value of $0.0009 < 0.05$ less than $\alpha = 5\%$ means that investment has a positive and significant effect on employment in the short term. Then from the ECT probability value of 0.0024 which is smaller than $\alpha = 5\%$ which means that this regression model is valid and appropriate.

In the F-statistical test the probability value shown in the estimation results is $0.000537 < 0.05$ less than $\alpha = 5\%$, which means that the variables of population, GRDP, and investment have a positive and significant effect on employment together in the short term. . Then the value of the determinant coefficient (R^2) shows the number 0.713654 , meaning that the population variable, GRDP, investment is able to explain the labor absorption variable of 71.36% and the remaining 28.64% is explained by other variables and factors not examined.

Table 5. Long-Term Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-280599.2	229892.8	-1.220565	0.2389
JP	0.531514	0.111754	4.756125	0.0002
GDP	-0.000110	0.000645	-0.170795	0.8664
INV	12.23511	3.540370	3.455884	0.0030
R-squared	0.953171	Mean dependent var		960137.8
Adjusted R-squared	0.944908	SD dependent var		113890.7
SE of regression	26732.17	Akaike info criterion		23.39477
Sum squared resid	1.21E+10	Schwarz criterion		23.59372
Likelihood logs	-241.6450	Hannan Quinn Criter.		23.43795
F-Statistics	115.3420	Durbin-Watson stat		1.797259
Prob(F-statistic)	0.000000			

Source: Eviews 10 (Data processed)

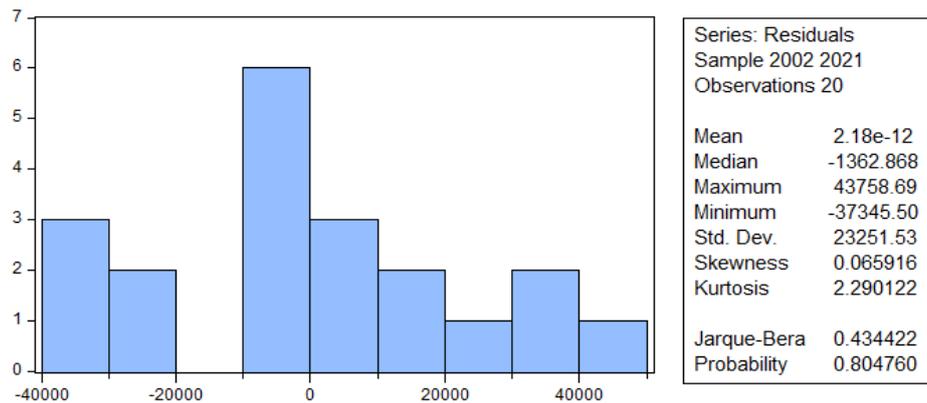
The probability value of the population variable $0.0002 < 0.05$ is smaller than $\alpha = 5\%$, which means that the population has a positive and significant effect on long-term employment. In the GRDP variable, the probability value of $0.8664 > 0.05$ exceeding $\alpha = 5\%$ means that GRDP has a negative and insignificant effect on long-term employment. In the investment variable, the probability value of $0.0030 < 0.05$ is smaller than $\alpha = 5\%$, it can be said that investment has a positive and significant effect on employment in the long term.

In the F-statistical test the probability value shown in the estimation results is $0.000000 < 0.05$ less than $\alpha = 5\%$, which means that the variables of population, GRDP, and investment have a positive and significant effect on employment together in the long term. Then the value of the determinant coefficient (R^2) shows a number of 0.953171, meaning that the variable population, GRDP, investment is able to explain the variable employment of 95.31% and the remaining 4.69% is explained by other variables and factors not examined.

4.1.4. Classic assumption Test

1) Normality Test

Through the normality test, it can be seen whether the observed variable data is normally distributed or not, using the Jarque-Bera (JB) test.



Source: Eviews 10 (Data processed)

Figure 1. Normality Test Results

From the normality test above, it can be interpreted that the data distribution is normally distributed, this can be seen from the Jarque-Bera value which shows a value of $0.434422 > 0.05$ more than $\alpha = 5\%$, so there is no normality problem or is said to have passed this test.

2) Multicollinearity Test

Table 6. Multicollinearity Test Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	94285787	2.753664	NA
D(JP)	0.057036	2.846519	1.264356
D(GDP)	8.37E-07	1.676037	1.280830
D(INV)	9.803987	1.289993	1.284002
ECT (-1)	0.076535	1.259800	1.254904

Source: Eviews 10 (Data processed)

From the results of the multicollinearity test, it can be seen that the VIF value shows the number < 10 , this means that there is no correlation between the independent variables (X), so that this model does not have multicollinearity problems or is said to pass this test.

c) Heteroscedasticity Test

Table 7. Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistics	1.218780	Prob. F(4,15)	0.3441
Obs*R-squared	4.905750	Prob. Chi-Squared (4)	0.2971
Scaled explained SS	1.780036	Prob. Chi-Squared (4)	0.7761

Source: Eviews 10 (Data processed)

From the results of heteroscedasticity testing, it can be said that this model has no heteroscedasticity problem, this can be proven by the value of Prob. Chi-Square of $0.2971 > 0.05$ or more than $\alpha = 5\%$, so this model is said to have passed the heteroscedasticity test.

d) Autocorrelation Test

Table 8. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistics	0.341404	Prob. F(2,13)	0.7170
Obs*R-squared	0.998054	Prob. Chi-Squared (2)	0.6071

Source: Eviews 10 (Data processed)

From the autocorrelation test, it can be said that this model is not affected by autocorrelation problems, this can be proven by the Prob value. Chi-Square of $0.6071 > 0.05$ or more than $\alpha = 5\%$, so this model is said to have passed the autocorrelation test.

4.2. Discussion

4.2.1. The Effect of Population on Labor Absorption

From the estimation results, it is stated that the population variable has a probability value ($0.3251 > 0.05$), which means that the population has no effect on employment in the short term. Thus, in the short term the population will not be the main contribution in the employment of North Sulawesi Province. The results of this study support research by Azzahra and Prakoso (2021) which provides research results that the variable population in the short term has a positive and insignificant effect on employment in the Province of Yogyakarta. Further, Kawet (2019) also reveal that the population has a positive and insignificant influence on the absorption of labor in the city of Manado. Therefore, the population is not always a factor that causes the absorption of labor to be high in an area (Sari, 2016).

In the long term, the population with probability value ($0.0002 < 0.05$) has a positive and significant effect on employment in North Sulawesi Province in 2001-2021. So it can be said that when the population increases, the absorption of labor also increases. In accordance with Adam Smith's theory which assumes that population is a potential input as a factor in increasing production, so the large number of people will result in a high amount of labor that can be absorbed. The population is used as capital for the development of an area because there will be a lot of manpower available to increase the amount of production output. Similar with Arsyad (1988) where HR is the right resource to rely on because when the population increases, the level of employment also increases. Supported by research Fachreza (2018) which shows the results that the population has a positive and significant effect on employment. Besides, Patriansyah (2018) also highlight that the population also has a positive and significant influence on employment.

4.2.2. The Effect of Gross Regional Domestic Product on Labor Absorption

From the estimation results of the GRDP variable with a probability value ($0.7727 > 0.05$) it means that GRDP has a positive and insignificant effect on employment in the short term. So that when GRDP has increased, it is not the main factor in the absorption of labor in North Sulawesi Province in 2001-2021. So the finding of this study support

Akbar and Bintoro (2019) statement that GRDP does not have a significant effect in the short term on employment. Also supported by research Ariyanto (2010) and Prasetyo (2021) which states that in the short term GRDP has a positive and insignificant effect on employment.

Meanwhile, in the long term, GRDP with probability ($0.8664 > 0.05$) means that it has a negative and insignificant effect on employment. So that the ups and downs of GRDP growth do not affect the absorption of apes in North Sulawesi Province in 2001-2021. This research can prove research Ningrum (2021) and Patriansyah (2018) which shows that the GRDP variable has a negative and insignificant effect on employment. Besides that, these finding also in line with the research carried by Akbar and Bintoro (2019) which states that in the long term GRDP has a negative effect on employment. From the GRDP data of North Sulawesi Province, it shows an increase but the calculation results have a negative influence, this could happen not only because of the number of working people, but also due to other factors such as the state of the world economy and political problems that occurred in Indonesia. ultimately affects the figures for forming GRDP and this certainly does not only occur in North Sulawesi Province but also in other regions.

4.2.3. The Effect of Investment on Labor Absorption

From the results of the estimated investment with a probability value ($0.0009 < 0.05$) it means that investment has a positive and significant effect on employment in the short term in North Sulawesi Province. So when investment increases, the absorption of labor also increases. The results of this study are in accordance with Prasojo (2009) namely from the existence of investment being able to become a driving factor in creating the latest and newest capital goods, so that they can absorb more modern production factors which in the end can create jobs that can absorb labor which is then able to reduce unemployment. Similar result was revealed by Azhari (2020) with the ECM method states that in the short term investment has a positive and significant effect on employment. According to Mahardika (2018) also noted that the investment variable in the short term has a positive and significant effect on employment.

In the long term investment with a probability value ($0.0030 < 0.05$) means that investment has a positive and significant effect on employment in North Sulawesi Province in 2001-2021. When investment increases, employment also increases. According to Sukirno (2000) the existence of investment will cause the community to continue to increase economic activity, so job opportunities have increased which resulted in many workers being employed to compensate for the increase in economic activity that occurred, thereby being able to increase income and the level of prosperity of the community. The results of this study support research carried by Surani et al. (2021) and Romdhoni (2017) which shows the results of the study that investment has a positive and significant effect on the variable of energy absorption. Moreover, this result also in line with Mahardika (2018) with the same method, namely the Error Correction Model, which states that the investment variable in the long term has a positive and significant effect on employment.

Apart from the results of the analysis of the influence of each variable individually, in this study it was found that simultaneously or simultaneously the variables of Population, Gross Regional Domestic Product (GRDP) and Investment had a positive and significant effect on employment both in the short and long term. in North Sulawesi

Province. The combination of these three factors can be used as a reference in increasing employment and as a benchmark in the formulation of better employment policies and economic development in North Sulawesi Province.

5. CONCLUSION

Based on the results of the analysis and discussion that has been carried out, it can be concluded as follows:

- 1) The variable population has a positive and insignificant effect on employment in the short term, while in the long term the population has a positive and significant effect on employment in North Sulawesi Province.
- 2) The variable Gross Regional Domestic Product (GRDP) has a positive and insignificant effect on employment in the short term, while in the long term GRDP has a negative and insignificant effect on employment in North Sulawesi Province.
- 3) The investment variable has a positive and significant impact on employment in the short term, while in the investment term it has a positive and significant effect on employment in North Sulawesi Province.
- 4) Then simultaneously or together the variables of Population, Gross Regional Domestic Product (GRDP), and Investment have a positive and significant influence on employment both in the short and long term in North Sulawesi Province in 2001-2021.

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