Determination of Poverty, Unemployment, Economic Growth, and Investment in West Sumatra Province

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ABSTRACT

This research aims to analyze the relationship between poverty, unemployment, investment, and economic growth in a simultaneous equation system with the factors that influence them. This condition is essential to identify the causes of poverty and unemployment and how investment and economic growth play a role in overcoming these problems. This research uses panel data from 19 districts/cities in West Sumatra from 2015 to 2020. The estimation technique used is a simultaneous equation using several classical assumption tests such as normality, heteroscedasticity multicollinearity, and Granger causality test. The results of this research show that 1) Unemployment, economic growth, education, and health have a significant effect on poverty in West Sumatra, 2) Economic growth, investment, and wages have a significant effect on unemployment in West Sumatra, 3) Unemployment, investment, poverty, and labor have a significant effect on the economic growth in West Sumatra, 4) Economic growth, wages, and taxes have a significant effect on investment in West Sumatra.

1. INTRODUCTION

The phenomenon of poverty and unemployment has become one of the main problems in development in West Sumatra. Poverty and unemployment can reduce the level of prosperity that has been achieved. It happens because poverty and unemployment can cause the real national income achieved by the community to be lower than the potential income (income that should be). Therefore, the prosperity achieved by the community will be lower [1].

However, data from the Central Statistics Agency (BPS) of West Sumatra show that the number of poor and unemployed people in West Sumatra has decreased [2]. In 2010, the number of poor people was 458.60 thousand people (9.44%); in 2015, it was 379.60 thousand people (7.31%); and in 2020, it was 344.20 thousand people (6.28%). Meanwhile, the number of unemployment in 2010 was 204.1 thousand people (6.95%); in 2015, it was 198.2 thousand people (6.89%); and in 2020, it was 190.61 thousand people (5.12%). Although the percentage of the poverty and unemployed in West Sumatra has tended to fall in recent years, when compared to the percentage of poverty and unemployed in Indonesia, the conditions that occur in West Sumatra are always above the national level, which indicates the occurrence of bad social problems in West Sumatera. The percentage of poor people in Indonesia in 2010, it was 9.23%; in 2015, it was 5.73%; and in 2020, it was 5.30%. Furthermore, the percentage of unemployment in Indonesia in 2010, it was 6.18%; in 2015, it was 6.21%; and in 2020, it was 4.94%. Based on the comparison of these conditions, poverty and unemployment in West Sumatra have tended to decline in recent years, poverty and unemployment are still severe problems faced in the future development of the West Sumatra region.

Various efforts and policies have been carried out to overcome the problem of poverty and unemployment, including encouraging investment and quality economic growth [3-12]. However, there are problems from moving data on poverty, unemployment, economic growth, and investment in West Sumatra. From 2010 to 2020, the trend of poverty and unemployment in West Sumatra had decreased. However, data on economic growth and investment in West Sumatra also experienced a decline, increasing economic growth and investment in West Sumatra. In 2010, the economic growth of West Sumatra reached 5.6%; in 2015, it turned to 5.53%, and in 2020, it decreased to -1.6%. Meanwhile, investment growth in West Sumatra in 2010 reached 6.59%; in 2015, it was 3.7%, and in 2020, it was -0.23%, which can be seen in Figure 1.
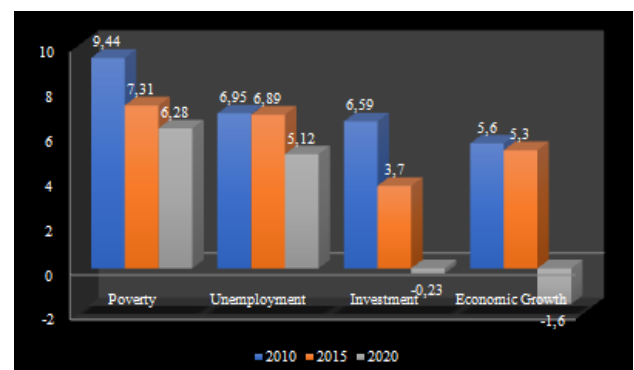
Figure 1. Trend of research variable data

Many research results show that investment and economic growth can absorb labor and reduce unemployment and poverty. However, there are still relatively few studies that examine the relationship among poverty, unemployment, investment, and economic growth simultaneously, especially

in the area of West Sumatra [7-20]. Many research results only examine the impact and influence of investment and economic growth partially or separately on poverty and unemployment. The problems of poverty, unemployment, investment, and economic growth do not stand alone but are interrelated in a system that influences each other.

Based on the factual phenomena and previous empirical findings, the purpose of this study is to analyze the relationship between poverty, unemployment, investment and economic growth using the simultaneous equation approach method, so that the framework to be analyzed considers the factors that influence them. This condition is essential to identify the causes of poverty and unemployment and how investment and economic growth play a role in overcoming these problems. The expected results of this research are as input for policymakers, especially the West Sumatra Regional Government, in preparing development programs related to alleviating poverty and unemployment in West Sumatra. In addition, this research can be used to prepare planning documents, regional head regulations, work programs, and others so that the problems of poverty and unemployment in West Sumatra can be more overcome in the future.

The scope of this research is classified as quantitative research because the research target is broad by using analytical emphasis on numerical data to test a theory with statistical methods. Furthermore, this study aims to provide a description, explanation and validation of a phenomenon under study. In this study, it will be seen how much influence exogenous variables have on endogenous variables.

2. LITERATURE

2.1 Poverty

Poverty is seen as the inability of a person or household from an economic point of view to meet basic food and non-food needs measured by the poverty line [11-15]. The poverty line is equivalent to spending a minimum of 2,100 kilocalories on food per day.

There is a strong relationship between high levels of unemployment and poverty. The majority of people who do not have permanent or part-time jobs are consistently among the very poor.

Economic growth is an indicator to see the success of development and is a condition for poverty reduction [11-16]. There is a correlation finding that there is a negative relationship between economic growth and poverty. An increase in economic growth will reduce the level of poverty, and this relationship shows the importance of accelerating economic growth to reduce poverty levels.

Several studies have explored poverty dynamics in various countries using various datasets and approaches. As a result, conclusions about the dynamics of poverty vary according to the approach applied in the analysis, including the research of poverty in Indonesia using three main approaches, namely the spelling approach, the component approach, and the similar poverty gap approach. The analysis shows that the spelling approach is estimated at 6.7% of households experiencing chronic poverty. Meanwhile, poverty with a sensitive component approach is estimated at around 11.07% of households classified as chronically poor (average spending below the poverty line). However, applying the poverty gap and the severity of poverty shows that the chronic components each account for 63.16% of the extreme poverty. Likewise, the poverty gap approach also shows that poverty in Indonesia is primarily chronic, accounting for 92% of the total poverty component. The high percentage of chronic poverty is contributed by the high cost of inequality [21].

Furthermore, Indonesia's poverty rate analysis is seen through economic growth, health, and education from 2004-to 2017. The results show that economic growth has a positive and insignificant effect on Indonesia's poverty level; Health has a negative and significant effect on poverty rates in Indonesia; Education has a negative and insignificant effect on the level of poverty in Indonesia [22]. Follow-up research on identifying poverty determinants in Indonesia was conducted in 7 districts and cities in the Gerbangkertosusila area during the 2010-2016 period. The results showed that the per capita GRDP, health, employment, and education variables had a negative and significant effect on the poverty variable. In contrast, the inflation rate variable does not affect poverty [23].

The analysis of the determinants of poverty levels continues to be explored by previous researchers, such as the research in Java Island, to formulate policy recommendations that can be implied to overcome poverty. The results of the analysis show that the determinants of the poverty rate in Java are the inflation rate, the human development index, the regional minimum wage, and the open unemployment rate; hence all these determinants need to be appropriately considered to formulate policy recommendations that can overcome poverty in Java [24]. Furthermore, the poverty research in Java was expanded by introducing several control variables consisting of the dependency ratio, education, and infrastructure for six provinces in Java in the period 2000-2017. The results showed that the dependency ratio and education significantly affected poverty, while infrastructure had a negative but not significant effect on poverty [25].

Meanwhile, more comprehensive research of the determinants of poverty was carried out in selected developing countries using the System Generalized Moments Method (GMM) for the period 1995-2015. The research results found that the lag value of the poverty rate, population, unemployment rate, and increasing in life expectancy increased the poverty rate. On the other hand, it was determined that the increase in per capita income, foreign trade ratio, the share of industry GDP, years of compulsory education, and individual internet use have a poverty reduction effect [26].

Based on the explanation of the literature review on poverty in various countries, that there is a gap in previous research. They only focus on the problem of poverty without studying other economic problems. In fact, poverty is related to unemployment, such as relative poverty that occurs due to the influence of uneven development in society, so that people are unemployed because of the lack of available jobs. Furthermore, poverty is also related to economic growth and investment because poverty alleviation can be done through increasing economic growth and investment. Goods and services produced by a country will increase if economic growth and investment increase, so this condition will encourage production expansion, in which producers will need additional labor inputs, so that people's incomes increase and poverty decreases. Based on this, we will fill the gaps of previous research by examining the relationship of poverty with several macroeconomic issues such as unemployment, economic growth and investment in addition to endogenous research arranged in the framework of simultaneous equations.

2.2 Unemployment

The harmful effect of unemployment is to reduce people's income, which reduces the level of prosperity that a person has achieved. The decline in people's welfare due to unemployment will undoubtedly increase their chances of being trapped in poverty because they have no income. If unemployment in a country is high, political and social chaos will occur and harm people's welfare and prospects for economic development in the long term [15-20].

Phillips describes how the distribution of the relationship between inflation and the unemployment rate is based on the assumption that inflation reflects an increase in aggregate demand [16, 17]. With high prices (inflation), producers increase their production capacity by adding more labor (labor is the only input that can increase output). As a result of increased demand for labor, unemployment decreases with rising prices (inflation).

Some various theories and hypotheses examine the relationship between unemployment and macroeconomic variables; however, the primary theoretical connection is provided by Phillips through the Phillips curve. Several previous studies have examined the problem of unemployment in various countries using various datasets and approaches. As a result, conclusions about unemployment conditions vary according to the approach applied in the analysis, including a new view of the determinants of unemployment in developing countries during the period 2000-2019 using the GMM approach; it was found that economic growth, inflation, exchange rates, and spending on education harm unemployment, while the population and foreign debt have a positive impact on unemployment [27].

Furthermore, the expansion of the unemployment research was carried out on the economic community in West African countries during 1991-2014 using a panel regression approach. The research results found that economic growth had a reduced but not significant effect on the unemployment rate, indicating the region's low elasticity of employment growth. Inflation has a tremendously positive impact on unemployment, which demonstrates the invalidity of the Phillips curve hypothesis. Another important finding is the positive impact of labor productivity on the unemployment rate, reflecting the trade-off between labor productivity and employment. Besides, foreign direct investment and external debt have a weak negative impact on unemployment, while population growth has a strong effect [28]. The same research was conducted for Palestine during 1994-2017 using a regression approach. The research results found that economic growth significantly affected unemployment with a negative effect, while inflation, labor force, and restrictions on the movement of labor affected unemployment significantly with a positive effect. In addition, external trade did not affect unemployment significantly [29].

Based on the explanation of the literature review on unemployment in various countries, that there is a void in previous research. They only focus on the problem of unemployment without studying other economic problems. In fact, there is a link between unemployment, poverty, economic growth and investment. Unemployment and poverty are the main macroeconomic problems. An increase in unemployment will cause income to fall and productivity levels will also be low, this also means that investment will also be low which in turn will affect economic growth. Based on this, we will fill the gaps in the previous research by examining the relationship between unemployment and several macroeconomic issues such as poverty, economic growth and investment as additional endogenous research arranged in the framework of simultaneous equations.

2.3 Economic growth

The relationship between national income and unemployment can be explained by Okun's Law [30-32]. Okun's law states a negative relationship between unemployment and actual output. It can be explained that when real output increases, the workers help produce goods while the unemployed workers do not. Therefore, an increase in the unemployment rate will cause actual output to fall.

The Solow growth model shows how the growth of the capital stock, the growth of the labor force, technological progress interacting in the economy and how they affect the output of goods and services of a country as a whole [31]. Like most other growth models, the Solow model also assumes that supply and demand for goods play an essential role in an economy. Theoretically, the supply of goods is based on the production function, which states that output depends on the capital stock (K) or investment and labor (L).

Several studies have shown that many factors that affect economic growth, such as population growth accompanied by efforts to improve health, education, and general welfare, will encourage economic growth [33]. The relationship between poverty and economic growth can be raised [34]. Empirical results show no relationship between poverty and economic growth in Nigeria, which is caused by weak government policies on human resource development. However, contrasting results show that poverty has a strong relationship with education and economic growth in the long run [35]. The same thing is also shown by Amar, et al, there is a significant influence between economic growth and the level of human poverty in ASEAN countries.

A panel regression approach conducted further studies for developing countries such as Indonesia during 2008-2017. The research results show that the population affects regional economic growth in the short term, while in the long term, economic growth is influenced by the poor, the General Allocation Fund, the health budget, and foreign investment. Another research finding is that the fiscal policy carried out by local governments makes a small and ineffective contribution to promoting economic growth [11].

While studies for developed countries such as countries in South America during the period 1960-2008 investigate the long-term determinants of economic growth using a two-equation framework, which consists of economic growth and foreign direct investment. The research results found that the accumulation of physical and human capital and sectoral exports were the most potent boosters of economic growth. Furthermore, institutions and policies significantly impact economic growth and investment, and macroeconomic disruptions significantly affect economic growth over the long term. Trade openness is positively correlated with foreign investment, suggesting that relatively closed countries benefit the most from opening up their economies [12].

Based on the explanation of the literature review on economic growth in various countries, that there is a gap in previous research. They only focus on the issue of economic growth without examining other economic issues. In fact, economic growth is related to poverty and unemployment because an increase in economic growth can indicate that more

and more workers will be absorbed by employment. Thus, more and more workers are absorbed, which will result in reduced unemployment and reduced poverty. Furthermore, economic growth is also related to investment because stable economic growth is one of the factors driving investors to invest in a country. Based on this, we will fill in the gaps of previous research by examining the relationship between economic growth and several macroeconomic issues such as poverty, unemployment and investment in addition to endogenous research arranged in a simultaneous equation framework.

2.4 Investment

The accelerator model emphasizes the relationship between demand for capital goods and final products. The demand for capital goods is derived from final goods and services. A simple accelerator model, assuming a fixed COR value, can be shown by the following mathematical equation [13]:

$$\frac{K}{Y} = v \tag{1}$$

where, K is the amount of capital used, Y is the aggregate output rate, and v is the Capital Output Ratio.

Eq. (1) states that to produce an output of Y_t over several periods, it takes a capital K1 which is equal to $v.Y_t$. therefore:

$$K_t = v.Y_t \tag{2}$$

$$K_t\text{-}1 = v.Y_t\text{-}1 \tag{3}$$

Since the net investment in period t, I_t is definitively equal to the change in the capital stock during period t, then:

$$I_t = K_t - K_t\text{-}1 \tag{4}$$

$$= v(Y_t\text{-} Y_t\text{-}1) \tag{5}$$

$$= v. \Delta y_t \tag{6}$$

Thus, in the simple accelerator model, investment expenditure will change by a fixed amount as the aggregate level of output changes.

Various economic theories result in the same conclusion: investment is a function of the interest rate. Where the ratio between changes in investment to changes in interest rates is less than zero or can be written [12]:

$$\Delta I / \Delta R < 0 \tag{7}$$

Meaning that an increase in the interest rate R will decrease investment expenditure, and conversely, a decrease in the interest rate will result in an increase in investment spending.

Previous researchers have analyzed investment determinants such as the effect of corporate taxes on investment and financial policies in the United States, which explored the quasi-experimental variation created by the reduction of domestic production activities. Reducing the tax rate by 1 percent would increase investment by 4.7 percent, increase payments by 0.3 percent of sales, and reduce debt by 5.3 percent of total assets. These estimates suggest that lower corporate tax rates and accelerated depreciation stimulate a similar investment increase [14]. Furthermore, the same result was also found by several researchers that high corporate tax rates discourage domestic and foreign fixed investment and therefore hinder economic growth [15]. This condition occurs because tax policy impacts the decisions of domestic and foreign investors [16]. Presumptively, investors consider tax policy when making their investment decisions [17]. Other research was conducted for China, in which the researcher looked at the effect of China's minimum wage regulations on firms' decisions to invest in physical and human capital. The results found a significant negative effect of the minimum wage on the level of human capital investment, and there was no overall effect on the level of fixed capital investment [18].

Based on the explanation of the literature review on investment in various countries, that there is a void in previous research. They only focus on investment issues without examining other economic issues. In fact, investment is related to economic growth because high investment will increase production activities and increase the number of goods and services produced so that economic growth increases. Based on this, we will fill in the gaps in previous research by examining the linkage of investment to economic growth as an additional endogenous research compiled in the framework of simultaneous equations.

3. METHOD

3.1 Data and variable

The data in the research are in the form of panel data, and the panel data are the combination of time series and cross-section data. This research data consists of 19 regencies/cities in West Sumatra from 2015 to 2020. The number of data in the research is 114. All data for the variables used in this study are sourced from the Central Statistics Agency or BPS [2].

The variables in this research consist of endogenous and exogenous variables. The endogenous variables are variables influenced by exogenous variables: poverty, unemployment, economic growth, and investment. Meanwhile, the exogenous variables are variables that change to affect the endogenous variables, consisting of education, health, wages, labor, and taxes. However, all endogenous variables used in this research also act as exogenous variables in other equations. The relationship among variables in this research is shown in Figure 2 below:
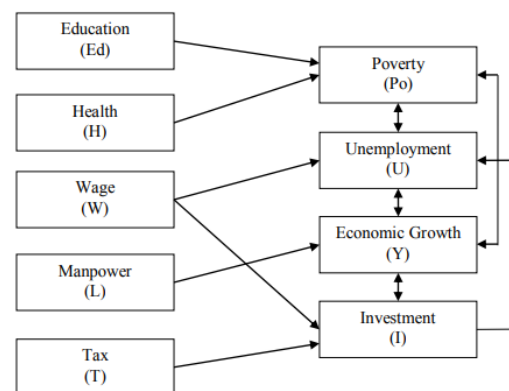

Figure 2. Conceptual framework of the research

Based on the conceptual framework of the research in Figure 2 above, the variables used in this research were measured using specific indicators, which are summarized in Table 1 below:

Table 1. Operational definition of research variables

Variable	Symbol	Indicator	Source
Poverty	Po	Percentage of poor people measured in percent	[2]
Unemployment	U	The open unemployment rate measured in percent	[2]
Economic Growth	Y	ADHK 2010 GDP growth as measured in percent	[2]
Investment	I	Gross fixed capital formation measured in millions of rupiah	[2]
Education	Ed	The average length of schooling taken by residents aged 15 years and over to take all types of formal education measured in years	[2]
Health	H	Pain rate measured in percent	[2]
Wage	W	Average monthly wages/net salary of workers/employees measured in rupiah	[2]
Workforce	L	The number of labor measured in soul	[2]
Tax	T	Local tax revenue measured in rupiah	[2]

3.2 Analysis model

Based on the conceptual framework in Figure 2, this research has four types of analytical models consisting of poverty, unemployment, economic growth, and investment. The econometric equations for the entire model are shown in Eqns. (8) to (11) below:

$$Po_{it} = \delta_0 + \delta_1 U_{it} + \delta_2 Y_{it} + \delta_3 Ed_{it} + \delta_4 H_{it} + \mu_{1i} \quad (8)$$

$$U_{it} = \theta_0 + \theta_1 Po_{it} + \theta_2 Y_{it} + \theta_3 I_{it} + \theta_4 W_{it} + \mu_{2it} \quad (9)$$

$$Y_{it} = \alpha_0 + \alpha_1 U_{it} + \alpha_2 I_{it} + \alpha_3 Po_{it} + \alpha_4 L_{it} + \mu_{3it} \quad (10)$$

$$I_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 W_{it} + \beta_3 T_{it} + \mu_{4it} \quad (11)$$

where:
δ, θ, α dan β: Parameter
i: Cross-section
t: Time series
μ: Residual

3.3 Data analysis technique

This research applies the Granger causality test approach and simultaneous equations. Granger Causality Test is a method to find out where an endogenous variable can be influenced by other variables (exogenous variables), and on the other hand, the exogenous variable can occupy a position as an endogenous variable. Such a relationship is called a causal or reciprocal relationship. Moreover, the simultaneous equation test is a model with more than one related equation and has a causal relationship among endogenous and exogenous variables. In other equations, a variable can be expressed as an endogenous or exogenous variable. If in a system of simultaneous equations containing two or more equations, it is impossible to get the numerical value of each parameter in each equation because these equations cannot be distinguished by observation or are very similar to one another. Hence it is necessary to carry out an identification test by using the order condition shown in Eq. (12) below:

$$K\text{-}k \geq m - 1 \quad (12)$$

where:
M: the number of endogenous variables in the model
m: the number of endogenous variables in the equation
K: the number of predetermined (exsogenous) variables in the model
k: the number of predetermined (exsogenous) variables in the equation

If K-k = m – 1, the equation is identified, then the simultaneous equation is estimated using the Indirect Least Square (ILS) method.
If K-k > m – 1, the equation is overidentified, which is followed by estimation of the simultaneous equation using the Two-Stage Least Square (2SLS) method.
If K-k < m – 1, the equation is unidentified.

Equations that a simultaneous equation system can solve are the results of the identified and overidentified order condition equations. Based on this explanation, the identification test in this research is as follows:

Equation 8: K-k = 5-2 > m-1 = 3-1 → 3 > 2 (overidentified)
Equation 9: K-k = 5-1 > m-1 = 4-1 → 4 > 3 (overidentified)
Equation 10: K-k = 5-1 > m-1 = 4-1 → 4 > 3 (overidentified)
Equation 11: K-k = 5-2 > m-1 = 2-1 → 3 > 1 (overidentified)

Based on the identification test results above, this research will use the 2SLS method to estimate the simultaneous equation model.

4. RESULTS AND DISCUSSION

Several tests were carried out before estimating the research model, namely the Granger causality test and the classical assumption test. Granger causality test basically can indicate whether a variable has a two-way relationship or only one way. If the probability value is small than = 0.05, then the two variables (endogenous variables) have a two-way relationship or influence each other. On the other hand, if the probability value is more significant than = 0.05, then the two variables (endogenous variables) have a one-way relationship or do not influence each other.

From the results of the Granger Causality test in Table 2, it was gained each probability value between poverty to unemployment, unemployment to poverty, economic growth to unemployment, unemployment to economic growth, economic growth to unemployment, economic growth to investment, investment to unemployment, and poverty to economic growth smaller than = 0.05. It means that variables of poverty to unemployment, economic growth to unemployment, economic growth to investment, and poverty to economic growth have a two-way relationship or influence each other.

Table 2. Granger causality test results

Null Hypothesis	F-Statistics	Probability
Po does not Granger Cause U	9.54568	0.0005
U does not Granger Cause Po	10.2217	0.0002
U does not Granger Cause Y	4.14734	0.0035
Y does not Granger Cause U	4.31751	0.0099
Y does not Granger Cause I	9.06644	0.0008
I does not Granger Cause Y	10.0715	0.0001
Po does not Granger Cause Y	7.58370	0.0091
Y does not Granger Cause Po	6.46390	0.0044

The results of this research are consistent with the results of previous studies. First, the causal relationship between the growth of poverty and unemployment occurs because the poor are identical with their low income, which has implications for low purchasing power so that the demand for goods and services is also low, resulting in an economic contraction due to a reduction in the number of workers [19]. Furthermore, there is always a relationship between unemployment and poverty in theory, and the effect is poor because unemployed people have no income [20].

Second, the causality of economic growth and unemployment occurs because economic growth will encourage economic activity to produce an increase in output, which in the production process requires input, including labor, therefore it will absorb unemployment to work. Meanwhile, unemployment has a direct negative impact on the economy, thus causing delays in national growth, which in the long term is a decline in economic growth and per capita income of a country [36].

Third, economic growth and investment causality occur because an increase in economic growth will encourage economic activity to increase output, known as expansion. It is necessary to expand production, especially from the investment sector [30], to respond to this. Furthermore, the easier the investment process, the more investment activities and a country's higher income. Then, investment can increase the economy's production capacity by increasing the capital stock. Capital formation is an expenditure that can increase the demand for the whole community's needs, which has implications for increasing economic growth [31].

Fourth, the causality of poverty and economic growth occurs because the level of poverty is high enough to cause people's purchasing power to below. As a result, companies or producers cannot sell many goods and services domestically, so producers will produce fewer goods not to suffer losses. That way, the number of production of goods will not increase from year to year so that the economy does not experience growth [32]. Furthermore, economic growth is an instrument used for poverty alleviation programs to provide capital so that the poor can create MSMEs (Micro, Small and Medium Enterprises) [37].

After that, the classical assumption test was carried out, namely the normality test, multicollinearity test, and heteroscedasticity test. The Jarque Bera method's test results show that the residual equations of poverty, unemployment, economic growth, and investment are typically distributed. Based on the Correlation Matrix method, there is no strong relationship among exogenous variables in each equation. Likewise, with the heteroscedasticity test with the Park test method, it was found that there was no heteroscedasticity problem in each equation.

From the estimates that have been made, the poverty equation model is obtained, as shown in Eq. (13).

$$Y = -35.29016 + 0.354326\ U^{**} - 0.390444\ Y^{**} - 0.415061\ Ed^{**} + 0.369553\ H^{**} \tag{13}$$

Partially, unemployment has a significant effect on poverty in West Sumatra. The existence of a significant influence between poverty and unemployment indicates that poverty is influenced by unemployment. This situation means that if unemployment increases, income will decrease because many workers are not working, so they are not generating income. The decrease in income will reduce people's welfare so that the poverty rate will also have an increasing impact. Vice versa, a decrease in unemployment will increase people's income because many workers are employed to increase their income [38].

The results of this research are also under the theory that states a close relationship between unemployment and poverty [17-20, 36]. In other words, an increase in unemployment will lead to an increase in poverty, while a decrease in unemployment will cause a decrease in poverty.

Partially, economic growth has a significant effect on poverty in West Sumatra. The existence of a significant influence between poverty and economic growth indicates that poverty is influenced by economic growth. This condition is because the community's income and real purchasing power will increase if economic growth increases. After all, increased economic growth will increase the production of goods and services so that the use of labor also increases, and the use of labor will increase income, thereby increasing purchasing power. Vice versa, Declining economic growth will reduce people's income and purchasing power because the economy's ability to absorb labor decreases due to a decrease in the production capacity of goods and services. Therefore, their welfare decreases and poverty increases [39].

This research follows the theory, which states that there is an inverse relationship between economic growth and poverty [37]. An increase in economic growth will lead to a decrease in poverty, and a decrease in economic growth will increase poverty.

Furthermore, education has a significant effect on poverty in West Sumatra partially. The existence of a significant influence between poverty and education indicates that poverty is influenced by education. This condition is due to the low level of education, which is reflected in low education results in limited self-development abilities and causes limited employment opportunities that can be entered so that poverty remains rampant. People living below the poverty line have limited access to education; hence the quality of their human resources is also low, which causes low productivity, so their income is also low. Low income will reduce welfare, triggering an increase in poverty. Otherwise, a high level of education reflected in high education will result in higher self-development abilities and cause more job opportunities that can be entered. This condition will improve the quality of human resources so that their productivity will also increase, and it will impact increasing income. Increased income will increase welfare to encourage poverty reduction [21].

The results of this research are under previous research [8], which concluded that the education variable has a significant effect on poverty. The author's research also finds a significant effect between education and poverty, and more education will reduce poverty and vice versa. However, this research results do not follow previous research, where Wijayanto concluded that GRDP has a negative but not significant effect on the poverty level and unemployment has a negative and

significant effect on the poverty level. In contrast, the author's research found that there is a negative and significant effect between economic growth and poverty and a positive and significant influence between unemployment and poverty.

Furthermore, health has a significant effect on poverty in West Sumatra partially. The existence of a significant influence between poverty and health indicates that poverty is influenced by health. Good health (decreased morbidity) will make individuals and communities have high productivity because their bodies and minds are healthy. This productivity will bring in and increase income for individuals and society. An increase in income will undoubtedly impact increasing people's welfare, and it will ultimately have implications for reducing poverty in the community.

On the other hand, if health deteriorates, people's productivity at work will certainly not be optimal. In the end, the community's ability to work is not productive, so it can reduce income. If allowed to continue, this situation will undoubtedly bring losses and increase people's opportunities to fall into the poverty caste [22].

The results of this research are also in line with the theory of human capital, which states that education and health will keep people from poverty. A high level of education and good health will increase income to decrease poverty, and low levels of education and poor health conditions will reduce income so that people's chances of becoming poor will increase.

From the estimates that have been made, the unemployment equation model is as follows:

$$U = 44{,}52615 + 0.415061\ Po^{**} - 0.975165\ Y^{**} \\ - 0.646497\ I^{**} + 0.398761\ W^{**} \qquad (14)$$

Partially, poverty has a significant effect on unemployment in West Sumatra. The existence of a significant influence between unemployment and poverty indicates that unemployment is influenced by poverty. In other words, an increase in poverty indicates a decrease in people's income. This falling income will weaken purchasing power and demand because this weakening purchasing power and demand will impact the decline in the production capacity of goods and services. If production capacity decreases, it will result in the Termination of Employment (PHK) so that many workers are disabled. This situation will encourage an increase in unemployment.

On the other hand, a decrease in poverty indicates an increase in people's income. This increased income will increase purchasing power and demand because this increased purchasing power and demand will impact increasing the production capacity of goods and services. If the production capacity increases, it will increase the use of production factors, including labor. Thus, this situation will trigger a decrease in unemployment [23].

The research results are in line with the theory found in Kakwani [12], which states that the magnitude of the impact of the crisis on poverty has led to the proliferation of bankruptcy incidents as a result of more significant pressure on job opportunities in the urban informal sector. It shows a very close relationship between the great extent of poverty and the unemployment rate. In other words, an increase in poverty will impact an increase in unemployment, while a decrease in poverty will impact a decrease in unemployment.

This research follows previous studies [11-14], which concluded that there is a significant influence between economic growth and unemployment. The author's research also finds a significant effect between economic growth on unemployment and an insignificant effect between inflation and unemployment in West Sumatra.

Partially, economic growth has a significant effect on unemployment in West Sumatra. The existence of a significant influence between unemployment and economic growth indicates that unemployment is influenced by economic growth. If economic growth increases, it means that there has been an increase in the production of goods and services because the increase in the production of goods and services will cause an increase in production factors, one of which is labor. This increase in demand for labor will result in a decrease in unemployment. On the other hand, if economic growth declines, there has been a decline in the production of goods and services because a decrease in the production of goods and services will cause a decrease in production factors, one of which is labor [24].

The results of this research are under the theory of Okun's Law [30-32, 37], which states that there is an inverse or negative effect between GDP and unemployment. An increase in economic growth will reduce unemployment, while a decrease in economic growth will increase unemployment. The author's research also finds an inverse relationship between economic growth and unemployment in West Sumatra.

Partially, investment has a significant effect on unemployment in West Sumatra. The existence of a significant influence between unemployment and investment indicates that unemployment is influenced by investment. Increased investment indicates an increase in investment activities, whether in establishing new factories, buying equipment and machinery, or so on. Therefore, this investment activity will require a lot of production inputs, including labor, so that the use or absorption of labor will increase. The condition of increasing employment absorption will reduce the unemployment rate. On the other hand, investment activities will also decrease if investment decreases. This condition will reduce producers' productivity in producing various types of goods and services, thus having an impact on decreasing the absorption of labor. This decrease in labor absorption implies an increase in unemployment [25].

The research results also follow the theory of the effect of investment on labor demand [31, 32]. Increased investment will increase the demand for labor so that the unemployment rate decreases.

In addition, wages have a significant effect on the unemployment rate. There is a significant effect between the unemployment rate and wages, indicating that wages influence the unemployment rate. An increase in wages will cause an increase in the company's production costs. This increase in production costs will certainly impact increasing output prices, causing demand for output to decline. Therefore, the company's profits will decrease. Thus, an increase in wages will cause companies to reduce their demand for labor so that the unemployment rate increases. Conversely, if wages decrease, the company's production costs will also decrease. This decrease in production costs will lower the price of output so that the demand for output increases and the company's profits also increase. This condition will undoubtedly encourage the demand for labor to decrease the unemployment rate [26].

The results of this research are in line with previous studies [16-18], which stated a positive relationship and influence between wages and unemployment. An increase in wages will

cause an increase in unemployment.

The results of this research are also under the theory that the number of labor demanded (demand for labor), both in the short and long term, has a negative relationship with wage levels [38]. If the wage rate increases, the demand for labor will decrease, which will increase the unemployment rate. Conversely, if the wage rate decreases, the demand for labor will increase to reduce the unemployment rate.

From the estimates that have been made, the unemployment equation model is obtained, as shown in Eq. (15).

$$Y = 0.557467 - 0.656631\ U^{**} + 0.552815\ I \\ - 0.593538\ Po + 0.291988\ L \qquad (15)$$

Furthermore, unemployment affects economic growth significantly in West Sumatra. The existence of a significant influence between unemployment and economic growth indicates that economic growth is influenced by unemployment. This condition is caused if unemployment increases; there will be a decrease in the factors of production, in this case, is labor. An increase in unemployment or a decrease in labor will cause a decrease in the productivity of the economy in producing goods and services. This decline in the production of goods and services will imply a decline in economic growth. On the other hand, if unemployment decreases, there will be an increase in the factors of production, in this case, labor. A decrease in unemployment or an increase in labor will lead to an increase in the economy's productivity in producing goods and services. This increase in the production of goods and services will imply an increase in economic growth [27].

Similar to the statement above, the results of this research are also in accordance with Solow's theory which states that economic growth is influenced by capital and labor. It means that a decrease in labor results in a decrease in economic growth, and a declining workforce indicates an increase in unemployment [30-32, 37].

Partially, investment affects economic growth significantly in West Sumatra. A significant influence between investment and economic growth indicates that economic growth is influenced by investment. If there is an increase in investment in West Sumatra, economic growth in West Sumatra will also increase because an increase in an investment indicates an increase in investment or capital formation. An increase in investment or capital formation will increase the production of goods and services, and this increase in the production of goods and services will lead to an increase in economic growth. Otherwise, if there is a decrease in investment, economic growth will also decrease because a decrease indicates a decline in investment or capital formation. This decrease in investment or capital formation will cause the economy to reduce the production of goods and services. A decrease in the production of goods and services will lead to a decrease in economic growth [28].

The results of this research are also in accordance with Solow's theory which states that economic growth is influenced by capital. The capital in the research is represented by investment [21-23]. Moreover, this research also found a significant influence between investment and economic growth in West Sumatra.

In addition, poverty affects economic growth significantly in West Sumatra. The existence of a significant influence between poverty and economic growth indicates that economic growth is influenced by poverty. It occurs because

increasing poverty will lead to a decrease in people's demand and purchasing power. If the demand and purchasing power of the people fall, the ability of producers to produce goods and services will also decrease. Thus, this situation will reduce economic growth. Conversely, if the poverty rate decreases, it will impact increasing people's demand and purchasing power. If the people's demand and purchasing power increase, producers' ability to produce goods and services will also increase [29].

Then, partially the workforce has a significant and positive effect on economic growth in West Sumatra. A significant influence between labor and economic growth indicates that economic growth is influenced by labor. If the workforce has increased, then economic growth will also increase because an increased workforce indicates that there has been absorption and an increase in inputs in producing goods and services. This absorption causes the production of goods and services to increase. Increased production of goods and services will imply economic growth. Otherwise, If the workforce has decreased, then economic growth will also experience a decline because the declining workforce indicates that there has been a reduction in production inputs. This reduction will disrupt the production of goods and services and even experience a decline. A decrease in the production of goods and services will imply a decline in economic growth [33].

The results of this research are also in accordance with Solow's theory which states that economic growth is also influenced by labor [20-24, 37]. It means that an increase in the workforce will affect increasing economic growth, and meanwhile, the decrease in the workforce will impact the decline in economic growth.

The results of this research are under previous studies [13-17], which concluded that there is a significant influence between investment and labor on economic growth. Furthermore, this research also finds a significant influence between investment and labor on economic growth in West Sumatra.

From the estimates that have been made, the investment equation model is obtained, as shown in equation 16.

$$I = 272857.1 + 5981.579\ Y - 11331.17\ W \\ - 10754.31\ T \qquad (16)$$

Meanwhile, partially economic growth has a significant influence on investment in West Sumatra. A significant influence between economic growth and investment indicates that investment is influenced by economic growth. This situation is caused by the occurrence of an increase in economic growth will have an impact on an increase in investment because increased economic growth means that the economy in the country has grown and expanded, so this is an excellent opportunity to invest. Thus investment will increase. On the other hand, a decline in economic growth indicates that the economy in the country does not provide an excellent opportunity to invest, so it will encourage investors not to invest. Therefore, the investment will decrease [34].

The results of this research are under the accelerator theory [31, 32, 37], which states that an increase in output (GDP) will increase investment. An increase in GDP increases investment because an increase in the output indicates an excitement in the economy so that investment will be more attractive.

Partially, wages have a negative and significant effect on investment in West Sumatra. There is a negative and significant effect; wages influence investment in West

Sumatra. It occurs because wages are a cost by investors. When wages increase, production costs will also increase because labor is input in production, and wages are remuneration for the use of labor production factors. Of course, it will reduce the returns and profits obtained by investors. The impact leads to a decrease in investment in West Sumatra. However, if the opposite happens, wages fall, the investment will increase because production costs fall, and the return on investment will increase. Of course, it will lead to increased investment in West Sumatra [35].

Partially, taxes also have a negative and significant effect on investment in West Sumatra. There is a negative and significant effect, it indicates that investment is also affected by taxes in West Sumatra. Taxes are also a component of costs in production by investors. High taxes will reduce the return on investment, and any investor does not desire this condition. If this condition continues, then definitely, the investment will decrease. On the other hand, the investment will increase if taxes decrease, or there are tax relaxation programs from the West Sumatra government. This situation will increase investors' enthusiasm to increase their investment desire [40]. It is in line with the return on investment theory that increased production costs such as wages and taxes will reduce investment returns. The decline in return on investment will lead to a decrease in the desire of investors to invest.

5. CONCLUSION

Conclusions in this study consist of several main focuses based on endogenous research. First, poverty is positively affected by economic growth, education and health. Meanwhile, unemployment affects negatively. Second, Unemployment is positively influenced by poverty and wages. Meanwhile, economic growth and investment affect negatively. Third, economic growth is positively influenced by investment and labor. Meanwhile, unemployment and poverty affect negatively. Fourth, investment is positively influenced by economic growth. Meanwhile, wages and taxes affect negatively.

Policy recommendations from the results of this study consist of several types based on endogenous variables in the study. Poverty reduction in West Sumatra is synergizing with all poverty alleviation programs implemented by the provincial and district/city governments, as well as optimizing the role of the regional poverty reduction coordination team for people income improvement, such as providing work assistance programs such as the national program for empowering independent communities and providing people's business loans, so that people can continue to develop their business. This will hopefully reduce poverty. Furthermore, the policy to reduce unemployment, the government in West Sumatra uses the income from fiscal policy for various developments. This development will later create new job opportunities thereby reducing the unemployment rate. This policy is carried out by the government by regulating the availability of money in a country. Then, the policy to encourage economic growth in West Sumatra is that the government needs to focus on three aspects, namely innovation and competitiveness, strengthening the domestic economy through re-industrialization and finally economic equity. Finally, the policy to encourage investment in West Sumatra is to provide incentives to investors to continue to increase investment activities by reducing investment costs, simplifying the investment process, providing information and serving investors if investors need information for their activities.

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