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Simultaneous Modeling Analysis of Poverty Panel Data in Jambi Province from 2011 to 2019

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Abstract

This study aims to determine and analyze the simultaneous modeling of panel data from the development of poverty levels in Jambi Province. Obtaining an economic model that is able to explain the effects and interrelationships thoroughly multidimensional (dimensions of education, health, employment) on the poverty level in Jambi Province. This study uses the Two Stage Least Square (2SLS) method with simultaneous equation analysis using panel data where the annual time series data is from 2011 to 2019 and cross section data in 11 regencies/cities in Jambi Province. The results of the analysis show that the estimated model parameters are in accordance with the theory. Variables that have a significant effect on poverty, average length of schooling, life expectancy, Gini ratio, open unemployment rate and economic growth in Jambi Province are population, population growth rate, GRDP per capita, capital expenditure, teacher-student ratio, number of infant deaths. , tax revenues, household consumption, and exports. Investments in the dimensions of education and health have a positive impact on improving people's welfare with the largest change being in the poverty variable. On the other hand, optimizing local tax revenue has a significant impact on increasing local revenue which is also an alternative in improving the welfare of the people in Jambi Province.

Index Terms: Poverty Rate, Education Level, Health Level, Open Unemployment Rate, Simultaneous Equation of Panel Data.

Introduction

Indonesia is a developing country that is faced with development in various social and economic sectors. The socio-economic development of a country is a multidimensional process that involves various basic changes in the socio-economic structure such as accelerating growth, maintaining price stability by always paying attention to inflation, maintaining a balance of payments, poverty alleviation, fair and equitable distribution of income, growth of investment- investment and tackle unemployment. Indicators of the

success of a development can be seen from the increase in the income per capita of the population as well as the ability to fulfill basic needs, the decrease in poverty, the availability of jobs and an even distribution of income in society (Jhingan, 2008). Development performance is not only measured by economic growth, but must also take into account the reduction of poverty and the handling of income inequality. Resource-based regional development is expected to be able to direct development to achieve growth, equity, and sustainability.

One of the regional economic growths is reflected in the overall increase in community income that occurs in the region (Priyarsono et al, 2007). In this context, the increase in community income is carried out through optimizing the utilization of existing resources in accordance with the potential of the community. So far, the development carried out has not touched this aspect, so that even though an area has enormous potential, it has failed to be utilized for development and the welfare of its people, so that the problem of unemployment, income distribution inequality and poverty continues to overshadow the development process. Poverty is a major development issue because the poverty level is an important indicator in measuring the success of the development process. Poverty conditions also indicate development inequality and an unequal distribution of income.

In addition to being a global concern, efforts to alleviate poverty are also contained in the national development plan in Indonesia which is stated in the form of Law Number 25 of 2004 concerning the National Development Planning system which was later stipulated through Law Number 17 of 2007 concerning Long-term development plans. National (RPJPN) 2005-2025. In its implementation, the RPJPN is divided into 4 (four) stages of development called the National Medium-Term Development Plan (RPJMN) for a period of 5 (five) years. One of the main national development agendas is “Economic Growth and Improving the Welfare of the Indonesian People” with the target of national priority programs including “Poverty Reduction and Food Security”.

The Multidimensional Poverty Index (MPI) or Multidimensional Poverty Index (IKM) was first developed by the "Oxford Poverty and Human Initiative (OPHI) with the United Nation Development Program" (UNDP) in 2010. The aim of the IKM is to portray poverty conditions more holistically. . This measurement was made because so far the most widely used global indicator in calculating poverty rates is through a monetary approach, such as the poverty line used by the World Bank with a limit of 1.9 US dollars purchasing power parity (PPP), or through the basic consumption approach (basic need) which is also used in Indonesia. This concept approach is more of an approach by looking at income or consumption made by humans. This monetary approach is still considered insufficient in capturing the root of the problem of human poverty (Sen, 1976).

The poverty rate in Indonesia in the period 2011 to 2019 poverty in Indonesia showed a significant downward trend, namely 12.36 percent in 2010 down to 9.22 percent in 2019 or in absolute terms from 28,593.93 thousand people to 24,785, 27 thousand souls. Poverty is a symptom that is more complicated than simply a lack of income, therefore caution is needed in interpreting the figures that show poverty reduction. As in the case of Pakistan, poverty reduction is actually a small shift from the “very poor” category to the “less poor” category (Thee Kian Wie 1981).

While in Jambi Province itself the poverty rate that occurred in Jambi Province from 2011 to 2019. In 2011 the poverty rate of Jambi Province was 7.90 percent or 251.36 thousand people, then in 2012 it rose to 8.28 percent or amounted to 268.47 thousand people and

continued to gradually increase in 2013, until 2014 it decreased from 8.41 percent in 2013 to 8.39 percent in 2014. In 2015 there was a significant increase of 8.86 percent or by 300.71 thousand inhabitants. However, in 2016 and 2017 there was a decrease of 8.41 percent and 8.19 percent, respectively. The years 2018 and 2019 were again in the range of 7.92 and 7.6 percent, respectively. However, this poverty reduction is still far from the expectations of the local government targeted in its RPJMD. When viewed from the Jambi Province RPJMD for 2019-2025 which targets poverty reduction to a level of 5 percent, it becomes a fairly heavy homework and requires a development strategy which of course can provide a multiplayer effect on poverty so that it can reduce poverty in accordance with predetermined plans.

To study poverty, of course, various studies and studies on poverty are carried out by both the government and academics. Each condition of poverty requires different handling, depending on the poverty experienced by humans. If poverty is analogous to a disease, then a doctor must be able to diagnose the disease before giving the right medicine. Based on this thought, several interesting problems emerged, namely how to analyze the modeling of the Jambi Province poverty rate when studied multidimensionally and which dimensions affect the poverty level in Jambi Province from 2011 to 2019.

Literature Review

A. Poverty

Poverty is a multidimensional problem which is characterized by the inability of individuals to meet the basic needs of standard living on the three problems of life. First, the problem of material shortages which usually includes the need for food, shelter, clothing and health services. Second, problems of social needs include social isolation, dependence, and the inability to participate in society. Third, the problem of lack of adequate income and wealth (Woyanti 2013). According to the Central Statistics Agency (2017), poverty is a person's inability to meet his economic needs, namely the need for food and non-food. BPS measures the adequacy of the need for 2100 calories per day. Meanwhile, non-food needs are measured by the fulfillment of a number of basic needs such as housing, clothing, education and health. The World Bank defines poverty as a deficiency in welfare which consists of many dimensions including low levels of health and education, poor people's access to clean water and sanitation, inadequate physical security, lack of adequate voice and capacity and opportunities for a better life.

B. Education

According to Todaro (2010), education is a way to save oneself from poverty and education is also a fundamental development goal, which is to play a key role in shaping a country's ability to absorb modern technology and to develop the capacity to create sustainable growth and development. According to Wijanarko (2013) people with higher education will provide opportunities to get good jobs and high salaries. The problem of education in Indonesia lies in the inequality in obtaining access to education between families who can afford and those who cannot afford it, while the costs that must be spent on education for both are relatively the same regardless of their family's economic background. As a result, many families cannot afford not to continue their education due to economic limitations.

Education is the basic capital of human resource development (HR). The literacy rate is one indicator of how people's welfare is measured, at least the community can read and write, it can improve welfare. With adequate education, national development will be easily achieved as planned. It is hoped that education will be able to answer the problem of poverty, low productivity and slow economic growth. Education not only increases knowledge, but also

improves work skills which in turn will increase work productivity. According to Heidjrahman (2000) the meaning of education is to increase a person's general knowledge, including increasing mastery of theory, skills in deciding problems involving activities to achieve goals. How to break the chain of causes of poverty, education is one solution that must be done by the government. Todaro (2006) stated that for many years, research in the field of economics has focused on research in the field of education, and sees the relationship between education and work productivity and the resulting output.

C. Health

One of the high quality human resources is characterized by the quality of their health. Juanita (2002) states that one of the basic capitals in the implementation of economic development is a good public health condition. Healthy public health conditions will certainly increase production productivity and also improve the welfare of the community itself.

Developing countries such as Indonesia are still lagging behind in terms of health quality compared to developed countries. One of the factors that affect it is health facilities, because the number of health facilities in Indonesia has not fully reached the community, especially in underdeveloped areas and inadequate infrastructure. So that health problems in Indonesia still require special attention from the government. Poverty is closely related to health, because poor people have low incomes so that their nutritional needs are not met. As a result, their health becomes disturbed, thereby reducing their productivity. In addition, the poor will also find it difficult to access health care because of insufficient funds.

D. Employment

The problem of poverty will never be separated from the problem of unemployment, because unemployment is one of the factors that causes increased poverty in developing countries, especially in Indonesia. Unemployed is someone who belongs to the labor force group but is not working or is looking for work. According to Kuncoro (2013), unemployment are those who are looking for work, or those who are preparing for a business, or those who are not looking for work because they feel it is impossible to get a job, and those who already have a job but have not started working. Unemployment is a macroeconomic problem that affects humans directly and is one of the serious problems faced by developing countries. The situation in most developing countries shows that economic development is unable to create job opportunities faster than population growth. Therefore, the unemployment problem faced from year to year is getting more and more serious. Not only the number of unemployed is increasing, but also their proportion of the total workforce is getting higher (Sukirno 2006).

Methods

E. Research Method

The type of data used in this study is secondary data in the form of a combination of time series and cross section data. Time series data includes annual data from 2011 to 2019, while cross section data covers 11 (eleven) districts/cities in Jambi Province. The source of the data in this study came from the Indonesian Central Bureau of Statistics. Researchers also use other sources such as journals, articles and other literature to add information related to research. The analytical technique used in this research is descriptive analysis to examine data trends, and parametric analysis through simultaneous modeling of panel data and the use of simulation models.

F. Research Model

The model used in the analysis is a simultaneous equation system with panel data. It is

proven that each equation formed is overidentified, so the right parameter estimation technique to use is the Two Stage Least Square (2 SLS) method for panel data (Baltagi, 2005).

Simultaneous equation model contains two types of variables, namely endogenous variables (endogenous) and predetermined variables (predetermined). Endogenous variables are variables whose values are set in the model, while predictive variables are variables whose values are set outside the model. Furthermore, the predictor variables are divided into two categories, namely exogenous variables (current or present time conditions and previous or past time or lag) and endogenous lag variables. In this case the exogenous variables of the current time conditions, exogenous lag variables, and endogenous lag variables are considered to be predictive (Goldberger 1964; Hu 1973; Dhrymes 1974; Gujarati and Porter 2009). Another definition of an endogenous variable is a random variable that has a probability distribution whose parameters are the elements in the system that are being estimated while an exogenous variable is a collection of known values, i.e. variables whose values are determined without a probability distribution (Klein 1972).

The following is a model of equations on m endogenous variables taken from Gujarati and Porter (2009):

$$y_{1i} = \alpha_{11}x_{1i} + \alpha_{12}x_{2i} + \cdots \alpha_{k2}x_{ki} + \beta_{12}x_{2i} + \beta_{13}x_{3i} + \cdots + \beta_{1m}x_{mi} + \mu_{1i}$$
$$y_{2i} = \alpha_{21}x_{1i} + \alpha_{22}x_{2i} + \cdots \alpha_{2k}x_{ki} + \beta_{21}x_{1i} + \beta_{23}x_{3i} + \cdots + \beta_{2m}x_{mi} + \mu_{2i}$$
$$\cdots$$
$$y_{mi} = \alpha_{m1}x_{1i} + \alpha_{m2}x_{2i} + \cdots \alpha_{mk}x_{ki} + \beta_{m1}x_{1i} + \beta_{m2}x_{2i} + \cdots + \beta_{m,m-1}x_{m-1,i} + \mu_{mi}$$

Where y_1, y_2, y_3,... y_m are m endogenous variables, x_1, x_2, x_3,... x_m are k exogenous variables (one of these variables is worth one which allows intercepts in each equation), μ_1, μ_2, μ_3 …μ_m is m random error, i=1,2,3,…,n is the total number of observations (observations), is the coefficient of exogenous variables and is the coefficient of endogenous explanatory.

G. Model Identification

Identification is a matter of model formulation (Koutsoyiannis 1973). In addition, identification is also defined as the problem of finding a unique or unique solution to the structural coefficients of the reduced form coefficients (Hu 1973). Therefore, logically identification is the initial prediction of a model (Goldberger 1964; Hu 1973; Greene 2012).

As a first step in estimating the structural coefficients in simultaneous equations, identification is usually carried out. The identification problem arises because of different sets of structural coefficients, i.e. different models can fit the same set of data. The problem of identification is intended to determine whether the parameter estimator value or the structural coefficient can be obtained from the reduced-form coefficients estimator. The reduced form coefficients are also known as impact or short-run or multipliers because they measure the direct impact on endogenous variables of a one-unit change in the value of the exogenous variable (Gujarati and Porter 2009). It is said to be multipliers because the large coefficient value can be obtained by performing derivatives or partial derivatives of endogenous variables on one particular predictor variable by keeping the other predictor variables constant (Goldberger 1964; Hu 1973).

Gujarati and Porter (2009) define a simpler identification rule using the terms of order and rank. It is also mentioned that the order requirement is a necessary condition, while the rank requirement is a necessary and sufficient condition. Suppose M is the number of endogenous variables in a system of equations, m is the number of endogenous variables in a particular equation, K is the number of predictive variables in a system of equations that contain intercepts, and k is the number of predictive variables in a particular equation. The

order requirements define as follows:

1. If K – k = m - 1, equation is said to be exactly identified
2. If K – k > m - 1, equation is said to have identified advantages
3. If K – k < m - 1, equation is said to be unidentified

H. Research Model Formulation

Based on the schematic framework of the simultaneous model in Figure 3, seven initial structural equations are formed in linear form, with seven endogenous variables (G), and thirteen predetermined variables (K), namely:

I. Education Dimension

$$RTLS_{it} = f_1(POV_{it}, AHH_{it}, LBM_{it}, RGM_{it}, LPDRBKAP_{it}) + \varepsilon_{it}$$

Where:
RTLS = Average length of school
POV = Poverty rate
AHH = Life expectancy
LBM = Capital expenditure
RGM = Teacher-student ratio
LPDRBKAP = Income per capita
ε = Error
i = 1,2,3 N (district/city)
t = 1,2,3.T (district/city)

J. Health Dimension

$$AHH_{it} = f_2(POV_{it}, RTLS_{it}, ALS_{it}, DKABKOT_{it}, LPDRBKAP_{it}) + \varepsilon_{it}$$

Where:
AHH = Life expectancy
POV = Poverty rate
RTLS = Average length of school
ALS = Infant mortality rate
DKABKOT = Dummy district/city
LPDRBKAP = Income per capita
ε = Error
i = 1,2,3.N (district/city)
t = 1,2,3.T (district/city)

K. Employment Dimension

$$TPT_{it} = f_3(AHH_{it}, LGR_{it}, PE_{it}, LPDRBKAP_{it}) + \varepsilon_{it}$$

Where:
TPT = Open unemployment rate
AHH = Life expectancy
LGR = Gini ratio
PE = Economic Growth
LPDRBKAP = Income per capita
ε = Error
i = 1,2,3 N (district/city)

t = 1,2,3 T (district/city)

L. Poverty Model

$$POV_{it} = f_7(RTLS_{it}, LGR_{it}, LPAD_{it}, PE_{it}, LPP_{it}) + \varepsilon_{it}$$

Where:
POV = Poverty rate
RTLS = Average length of school
LGR = Gini ratio
= Regional Income
LPE = Economic Growth
LPP = Population growth rate
ε = Error
i = 1,2,3…..N (district/city)
t = 1,2,3…..T (district/city)

Discussions

The modeling built in this research is simultaneous modeling with panel data to identify the variables that affect the poverty level with a multidimensional approach in Jambi Province. In addition, it also looks at the effect of each dimension model built on the poverty level in Jambi Province. Simultaneous model equations used in this research are used to identify the relationship of each dimension model built to the poverty level. In order to use proper modeling in each dimensional model, it is necessary to identify the model using the rank condition method.

Table 1. *Identification of Simultaneous Equation Model with Rank Condition*

Model	m	k	K	$K - k \geq m - 1$	Identification
$\mathbb{M}$	4	1	13	Ya	Overidentified
$RTLS$	2	3	13	Ya	Overidentified
AHH	2	3	13	Ya	Overidentified
TPT	3	2	13	Ya	Overidentified

Description: m = Number of endogenous variables in the structural equation; k = Number of exogenous variables in the structural equation; and K = Number of exogenous variables in the system.

The next procedure that must be carried out for simultaneous equation estimation is the simultaneity test. This test aims to prove empirically that there is a simultaneous relationship between structural equations in a system of equations. The first step to test the simultaneity of poverty level and other dimensions is to get an estimate of each of these equations. Then, the estimation results along with the residuals from the reduced form equation are substituted into each structural equation. The results of the parameter estimation on the coefficient of the residual variable were carried out by a partial test (t-statistic). If it is statistically significant, which means the null hypothesis is rejected, then there is a simultaneity problem. On the other hand, the null hypothesis is accepted which means that there is no simultaneity.

Table 2. *Summary of Simultaneous Testing Results on Structural Equations*

Model	Reduced Form	P-Value $\hat{Y}$ *dan Residuals*	Information

Model	Reduced Form	P-Value $\hat{Y}$ dan Residuals	Information
POV	RTLS	0,000* 0,000*	Simultaneous
	LGR	0,026* 0,088**	Simultaneous
	LPAD	0,000* 0,072**	Simultaneous
	PE	0,000* 0,002*	Simultaneous
RTLS	AHH	0,000* 0,002*	Simultaneous
	POV	0,082** 0,017*	Simultaneous
AHH	RTLS	0,000* 0,002*	Simultaneous
	POV	0,003* 0,028*	Simultaneous
	AHH	0,025* 0,074**	Simultaneous
TPT	PE	0,056** 0,059**	Simultaneous
	LGR	0,069** 0,048*	Simultaneous

Description: m = Number of endogenous variables in the structural equation; k = Number of exogenous variables in the structural equation; and K = Number of exogenous variables in the system.

Analysis of Modeling Results

Poverty rate modeling with a multidimensional approach is built using an econometric approach in the form of a simultaneous equation system model with panel data consisting of seven structural equations. The estimation method used is the Two Stage Least Squares (2SLS) method. The parameter estimation results give a satisfactory coefficient of determination (R2) where most of them range from 0.80–0.91. In addition to the statistical criteria R2, the results of the analysis show that all explanatory variables have signs that are in accordance with expectations, based on economic theory and empirical conditions and logical results. In general, the exogenous variables used are able to explain the diversity of the endogenous variables.

In each structural equation, the explanatory variables together significantly affect the endogenous variables, which can be seen from the F statistic value, ranging from 7.29 to 398.03 at the 1% significance level. This shows that each independent variable in the model together has a significant effect on the dependent variable. The endogenous variables in each equation are significantly influenced by most of the explanatory variables individually with a significant level (α) of 5%. The main orientation in this study is the sign of the estimated parameters in accordance with expectations, based on economic theory and logic. Overall, the estimation results of the model are quite representative so that they can describe the phenomenon of poverty seen with a multidimensional approach. This multidimensional

approach is formulated in various structural equations from each of the dimensions formed, namely the education dimension, employment dimension, economic dimension, health dimension, fiscal dimension and poverty dimension.

Results of the Structural Model of Poverty

The poverty structural equation model is formed from the indicators of average length of schooling (RTLS), Gini ratio (LGR), local income (LPAD), economic growth (PE) and population growth rate. The results of the estimation of the parameters of the poverty model produce a value of the coefficient of determination (R2) of 0.9198, which means that the model has been able to explain the diversity of problems of 91.98% and the rest is explained by other variables outside the model. The endogenous variables in the poverty equation are significantly affected by the explanatory variables together which are indicated by the value of Prob > chi2 at a significant level (α) 0.05. The results of the estimation of the poverty equation show that poverty is significantly affected by the average length of schooling (RTLS), the Gini index (GR), local income (LPAD) and the rate of population growth (LPP), while economic growth (PE) has an effect but is not significant. . More details about the results of the estimation of the parameters of the structural equation of poverty are as follows:

Table 3. *The results of Parameters Estimation of Poverty Structural Equation*

Variable	Coefficient	Probability
Intecept	27,96456	0,000
Average length of school	-2,045787	0,000
Gini Ratio	8,63177	0,038
Regional Income	-2,593665	0,000
Economic growth	-0,3155733	0,280
Population growth rate	1,514052	0,000
* Significant on a real level 5%	Prob > chi2 = 0,000	R^2 = 0,9198

Source: *Stata output 14 (processed)*

When examined partially, the table of estimation results of the structural equation parameters of poverty as shown above states that partially affecting poverty with a negative and significant relationship is the average length of schooling and local revenue. And the positive and significant effect on the level of poverty is the Gini ratio.

M. The Results of the Structural Model of the Education Dimension

In the structural equation model, the dimensions of education are formed from indicators of poverty level (POV), life expectancy (AHH), GRDP per capita (LPDRBKAP), capital expenditures (LBM) and teacher-student ratios (RGM). The results of the estimation of the parameters of the educational structural model produce a coefficient of determination (R2) of 0.8799 which means that the model has been able to explain the diversity of problems of 87.99% and the rest is explained by other variables outside the model. The endogenous variables in the education dimension model equation are significantly influenced by the explanatory variables together, which are indicated by the value of Prob > chi2 at a significant level (α) 0.05. The results of the estimation of the education dimension equation show that education in this case is represented by the average length of schooling (RTLS) which is significantly affected by life expectancy (AHH), population per capita income (LPDRBKAP), capital expenditures (LBM) and teacher-student ratio (RGM).), while the poverty rate (POV) is influential but not significant. Details about the results of the estimation of the parameters of

the structural equation of the dimensions of education are as follows:

Table 4. *The results of Parameters Estimation of the Structural Equation of Education Dimension*

Variable	Coefficient	Probability
Intecept	-34,04806	0,000
Poverty level	-0,0165886	0,727
Life expectancy	0,5873603	0,000
Income per capita	0,8671824	0,001
Capital Expenditure	0,6913427	0,020
Teacher Student Ratio	-0,105503	0,000
* Significant on a real level 5%	Prob > chi2 = 0,000	R^2 = 0,8799

Source: *Stata output 14 (processed)*

Partially, the results of the estimation of the parameters above that have a positive and significant effect on the dimensions of education are life expectancy, income and capital expenditure. Meanwhile, the teacher-student ratio has a negative and significant effect on the dimensions of education

N. The Results of the Structural Model of the Health Dimension

Life expectancy or life expectancy (AHH) is used as an indicator in the health dimension model which is formed from the indicators of average length of schooling (RTLS), poverty (POV), per capita income (LPDRBKAP), infant mortality rate (ALS) and city/rural dummy variable (DKABKOT). The results of the estimation of the parameters of the structural equation model of the health dimension resulted in a coefficient of determination (R2) of 0.9702, which means that the model has been able to explain the diversity of problems by 97.02% and the rest is explained by other variables outside the model. The endogenous variables in the education dimension model equation are significantly influenced by the explanatory variables together which are indicated by the value of Prob > chi^2 at a significant level (α) of 0.05. The results of the estimation of the health dimension equation show that health in this case is represented by life expectancy (AHH) which is significantly influenced by the average length of schooling (RTLS), poverty (POV), and infant mortality rate (ALS), while per capita income (LPDRBKAP)) and the dummy district/city effect but not significant. Details about the results of the estimation of the parameters of the structural equation of the dimensions of education are as follows:

Table 5. *The results of Parameters Estimation of the Structural Equation of Health Dimension*

Variable	Coefficient	Probability
Intecept	62,24578	0,000
Average Length of School	1,156011	0,000
Poverty level	-0,2050956	0,002
Income per capita	0.4188544	0,299
Infant Mortality Rate	-0.0485263	0,000
Dummy District/City	0.7468311	0,286
* Significant on a real level 5%	Prob > chi2 = 0,000	R^2 = 0,9702

Source: *Stata output 14 (processed)*

The Health dimension itself is partially influenced by the average length of schooling

with a positive and significant effect, while the poverty rate and infant mortality rate have a negative and significant effect.

O. The Results of the Structural Model of the Employment Dimension

In the structural equation model, the dimensions of employment are formed from indicators of economic growth (PE), Gini ratio (GR), life expectancy (AHH), per capita income (LPDRBKAP), and population growth rate (LPP). The results of the estimation of the structural model parameters of the employment dimension produce a coefficient of determination (R2) of 0.8127, which means that the model has been able to explain the diversity of problems by 81.27% and the rest is explained by other variables outside the model. The endogenous variables in the employment dimension model equation are significantly influenced by the explanatory variables together which are indicated by the value of Prob > chi2 at a significant level (α) of 0.05. The results of the estimation of the education dimension equation show that education in this case is represented by the average length of schooling (RTLS) which is significantly affected by life expectancy (AHH), population per capita income (LPDRBKAP), capital expenditures (LBM) and teacher-student ratio (RGM).), while the poverty rate (POV) is influential but not significant. Details about the results of the estimation of the parameters of the structural equation of the dimensions of education are as follows:

Table 6. *The results of Parameters Estimation of the Structural Equation of Employment Dimension*

Variable	Coefficient	Probability
Intecept	-23,72316	0,028
Economic growth	0,0290586	0.919
Gini Ratio	7,467108	0,009
Life expectancy	-0,5107474	0,000
Income per capita	-0,546206	0,031
Population Growth Rate	0,6759325	0,019
* Significant on a real level 5%	Prob > chi2 = 0,000	R2 = 0,8127

Source: *Stata output 14 (processed)*

Partially, this employment dimension is influenced by the Gini ratio and the rate of population growth with a positive and significant relationship. Then partially influenced also by life expectancy and income per capita with a negative and significant relationship.

P. Policy Implications

Based on the results of the study of the simultaneous model of poverty panel data with a multidimensional approach, several policy implications for the Jambi Provincial government can be formulated which can be used as a policy basis in reducing poverty levels in Jambi Province. Some of the formulations of the policy implications are:

The improvement of the education system is a fixed price that must be resolved by the local government because the education system is not in harmony with the needs of the labor market also raises the problem of unemployment for the region and high unemployment will also lead to a high level of poverty. The government needs to implement the following policies. First, the government needs to put emphasis on universities to be able to change their academic emphasis to research-based ones for industrial needs and provide input for government policies. Second, the entrepreneurial movement is included in the curriculum from basic education such as junior high school and vocational school. Entrepreneurship education is

expected to be able to change people's mindsets to create jobs, not just looking for work. The entrepreneurial movement is also a step to increase employment opportunities.

Population control program, in the next few years Indonesia will experience a demographic bonus. The government must improve the quality of existing human resources to prepare for the demographic bonus. If the government fails, the state will bear a large economic burden such as unemployment which will later cause other socio-economic problems such as poverty. In addition, the rate of population growth needs to be controlled to prevent population explosion. Not only reducing the birth rate, the problem of migration which always increases every year also needs to be watched out for. If the existing workforce is not utilized properly, it will cause unemployment and poverty problems. the government also needs to make policies so that business actors consider local workers more than migrant workers. The policy to prioritize local workers needs to be carried out considering the fact that migrant workers in Jambi Province are still mostly done by migrant workers. The policy on the proportion of local workers is expected to be able to reduce the number of incoming migrations to Jambi Province, thereby reducing job competition in Jambi Province and reducing the number of unemployed who have an impact on poverty.

Conclusion

Poverty in terms of multidimensional has a simultaneous influence with other dimensions, either directly or indirectly. Poverty is directly and simultaneously influenced by the level of education, inequality, local income and population growth rate. Poverty is also indirectly affected by the simultaneous equation system through other dimensions, namely by indicators of health, per capita income, household consumption, capital expenditures, teacher-student ratios, population, infant mortality, total exports, unemployment and tax revenues.

Increasing education is the best solution in alleviating poverty, which can be seen from the modeling results which show a significant relationship. High poverty can be overcome with high access to education. High access to education is seen based on the ease with which a person can take education which will be illustrated by a high average length of schooling. Education is very important because it is not only to alleviate and break the chain of poverty but also to improve the quality of life of the community. Gini ratio, local revenue and population growth rate can significantly reduce poverty in Jambi Province. Meanwhile, economic growth has not been able to suppress the poverty rate in Jambi Province.

Local governments should be more optimal in improving access to education and health both in terms of infrastructure and experts because it is the basis for improving the quality of life of the people's human resources. With the quality of healthy and educated human resources, they will be better prepared to enter the world of work so that they can reduce poverty. Policy programs can be used like the simulation results, namely increasing the level of education to an average length of schooling of 10 years and a life expectancy of 72 years. The multidimensional impact will not only reduce poverty but also have a positive impact on economic growth.

Various population control programs can also be carried out by local governments. Apart from being controlled by the population, it can also be used as a valuable asset in driving the wheels of the economy through improving the quality and consumption of the population. Increasing local tax revenues with various improvements to the system and management of tax revenues has become a major asset for the government in increasing local revenue. The amount of regional income certainly has a multidimensional impact on various socio-economic sectors,

where poverty alleviation policy programs can run well with the right budget support.

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