Impact of life expectancy, literacy rate, opened unemployment rate and gross domestic regional income per capita on poverty in the districts/city in Central Sulawesi Province

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Abstract. Research was conducted in several districts/city in Central Sulawesi Province in order to determine the effect of life expectancy, literacy rate, opened unemployment rate, and gross domestic regional income per capita on poverty at the districts/city in the province. The analysis used is Panel Data Regression. The results show that first, life expectancy and gross domestic regional income have a negative and significant impact on the poverty level in the districts/city in the Province. Second, the opened unemployment rate has a positive and significant effect on the poverty level in the districts/city in the province. Third, literacy rates show a positive effect and insignificant effect on the poverty level in the districts/city in the Province of Central Sulawesi. Fourth, these four variables simultaneously affect the poverty in the districts/city in Central Sulawesi.

1. Background

Poverty is a complex issue that is influenced by a variety of interrelated factors, such as income level, unemployment, health, education, access to goods and services, location, geography, gender, location and environment [1, 2]. The issue of poverty is the focus of development in each country.

Astrini et al. [3] research focus on the effect of GDRP, education, and unemployment on poverty in Bali. In order to achieve these objectives, multiple regression analysis is done. The following result are obtained firstly, GDRP has no significant and negative effect on poverty. Secondly, education has significant and negative effect on poverty [4].

The poverty line according to the Central Agency of Statistics [5] which is used in this measurement equivalent to the amount of Rupiah per capita per month required to meet the daily needs of 2,100 kilo calories per capita plus some non-food commodities such as housing, clothing, education, and health. Bhattacharyya and Resosudarmo [6] state that per capita income has a positive
and insignificant effect because with the high per capita income owned by each province, it will increase the poverty rate but not significant change. This is because per capita income is usually used only for the improvement of infrastructure of the region as concerned [4].

The first target in the MDGs is to eradicate poverty and hunger, the poverty rate of the population living below the national poverty line is between 8% and 10%. The MDGs target in accordance with the Public Budget Policy of Central Sulawesi Province in 2011-2016 period outlined in the Medium Term Development Planning (RPJMD) 2011-2016 period. Development of education and health are the two pillars to form human capital in economic development is an investment in the long term. The achievement of development goals in education and health, can improve the quality and productivity of the population, with the population of productivity growth is the engine of economic growth and welfare of the population.

Central Sulawesi RPJMD targets for life expectancy (AHH) in 2013 were 71.90. But the reality in 2013 AHH of Central Sulawesi is 67.21. This shows that the life expectancy of the population in Central Sulawesi, about 67.21 years. One of several characteristics of poverty is education. Education as a determinant of poverty significantly and positively affects the per capita consumption of families and poverty. One of several measurements for the level of education is the literacy rate (AMH). In line with the MDGs by 2015 the target of education for all, Central Sulawesi province RPJMD targets for achieving the literacy rate in 2013 amounted to 97.69. The target cannot be realized, because in 2013 the literacy rate amounted of Central Sulawesi to 96.22. This figure shows that approximately 96.22% of the population in Central Sulawesi has the ability to read and write (literacy).

The level of income is the element that determines the wealth of a society. Public income reaches its maximum when the conditions of full employment level of usage (full employment) can be realized. Unemployment will cause the effect of reducing public revenue, and it will reduce the level of prosperity that has been achieved. Economic growth is crucial to reducing poverty in the region [7]. The high economic growth needed to accelerate change towards economic structure of the regional economy is increasing and dynamic industry, characterized by powerful and advanced, and has a strong agricultural base sectoral growth is potentially huge [8, 9]. Economic growth is also necessary to mobilize and spur development in other fields as well as the main force of development in order to increase people's income and address socio-economic imbalances. The study was conducted to determine what factors affecting poverty in the districts / city in Central Sulawesi province. The formulation of the problem statement, namely: does Life Expectancy (AHH), literacy rate (AMH), Unemployment Rate (TPT), and the Gross Domestic Income (PnDRB per capita) affect the level of poverty in the districts / city in Central Sulawesi province.

2. Research Method

This study examined the level of poverty throughout the Districts / City in the province of Central Sulawesi, namely: Banggai, Banggai Islands, Morowali, Poso, Tojo Una-Una, ParigiMoutong, Donggala, Toli-Toli, Buol, Sigi and the Municipality of Palu in 2010-2013 periods. Researchers provide understanding and explanation of each term used as follows:

Poverty (Y). According to the Central Statistics Agency (BPS) is the percentage of population below the poverty line in each district /city in Central Sulawesi. In this study examined poverty is the percentage of people living below the poverty line (P0). Life Expectancy (X1). Estimates of the number of years of life or the life of residents in an area measured by life expectancy expressed in years. Because of the AHH the data we can see the performance of the government in improving the health of residents in an area, whether an increase or decrease from year to year. Literacy Rate (X2). Literacy Rate (AMH) represents the percentage of population aged 15 years and over who can read and write. AMH is an important indicator to look at the extent to which the population of a region open to knowledge, skills, easiness in communication. Unemployment Rate (X3). The working age population that is included in the group of unemployed measured by the Unemployment Rate (UR) expressed as a percent. Because of the data we can see the UR successful performance of government in employment programs in an area, whether an increase or decrease from year to year. Per Capita
**Gross Regional Domestic Product (X₄)**. Gross Regional Domestic Product at constant prices is used because it can be a means of comparison are considered more accurate to measure the level of prosperity of the people of interstate / inter-regional / inter-sectoral.

3. **Data Analysis**

The data used in the econometric analysis consists of three types of time series data, cross section and panel data. At the time series data, some variables will be observed within a certain time, while the cross-section data, some variables were collected from multiple sample units within a certain time point. Data panel is a combination of time series data (time series) and data cross-section (cross section).Panel data regression model in this study is to use the dependent variable poverty rate (PR), while the independent variable is the life expectancy, literacy rate, Unemployment Rate, Gross Domestic Regional Income. These variables could be formulated as follow:

\[
Y = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_i (1)
\]

Where:
- \(Y\) = the poverty rate (%);
- \(X_{1it}\) = variable life expectancy (years);
- \(X_{2it}\) = variable literacy rate (%);
- \(X_{3it}\) = variable Unemployment (%);
- \(X_{4it}\) = variable Per Capita Income (in million rupiah);
- \(i\) = unit of cross section;
- \(t\) = unit of time series;
- \(\alpha\) = constant
- \(\beta\) = coefficient
- \(\varepsilon_i\) = residual

The model can be expressed in the form of a log linear model through the transformation of variables. Transformation is done by logarithm equation, so that the model is transformed into shape linear.

\[
Y_{it} = \alpha + \beta_1 \log X_{1it} + \beta_2 \log X_{2it} + \beta_3 \log X_{3it} + \beta_4 \log X_{4it} + \varepsilon_i (2)
\]

4. **Results and Discussion**

The relationship between \(Y\) and \(X_2\) is likely to have a very weak correlation or no correlation. Best Regression Model Selection Panel Data Regression Results Double log regression analysis using the program E-views are as follows:

4.1. **Fixed Effect Regression Model Results**

\[
\log(Y_{it}) = 14.2 - 7.3 \log(AHH_{it}) + 1.9 \log(AMH_{it}) + 0.03 \log(TPT_{it}) - 0.52 \log(PnDRBPerKAP_{it}) + \varepsilon_{it} (2,0980)** (-3,0264)***(0,5161) (2,1656)***(-5,2315)***(6,4965)***(-6,5317)***(0,4004) (0,6770)(-1,1737)
\]

Adjusted \(R^2 = 0.9886\)

** Significant at \(\alpha = 1\%\) level

** Significant at \(\alpha = 5\%\) level

4.2. **Results Regression Model Common Effect**

\[
\log(Y_{it}) = 16.24 - 8.4 \log(AHH_{it}) + 0.55 \log(AMH_{it}) + 0.04 \log(TPT_{it}) - 0.13 \log(PnDRBPerKAP_{it}) + \varepsilon_{it} (0,4004) (0,6770)(-1,1737)
\]
4.3. Random Effect Model Regression Results

\[ \log(Y_{it}) = 16.76 - 6.79 \log(AHH_{it}) + 0.12 \log(AMH_{it}) + 0.03 \log(TPT_{it}) - 0.52 \log(PnDRBPerKAP_{it}) + \nu_{it} \]

(3.8479)*** (-3.9478)*** (0.0504) (2.2876)** (-6.2445)***

Adjusted R\(^2\) = 0.8735
*** Significant at \(\alpha = 1\%\) level
** Significant at \(\alpha = 5\%\) level

Based on a series of model significance testing that has been done, it can be determined that the model used to estimate the regression model of poverty in the districts / City in Central Sulawesi province is a model Random Effect.

\[ \log(Y_{it}) = 16.766 - 6.79 \log(AHH_{it}) + 0.12 \log(AMH_{it}) + 0.03 \log(TPT_{it}) - 0.52 \log(PnDRBPerKAP_{it}) + \nu_{it} \]

(3.8479)*** (-3.9478)*** (0.0504) (2.2876)** (-6.2445)***

Adjusted R\(^2\) = 0.8735
*** Significant at \(\alpha = 1\%\) level
** Significant at \(\alpha = 5\%\) level

Equation regression results the effect of life expectancy, literacy rate, opened unemployment rate, and Gross Domestic Regional Income per capita on poverty in the districts / city in Central Sulawesi by using Random Effect Model, the value of the regression coefficients for each variable in the study by the equation as follows:

\[ \log(Y_{it}) = 16.76 - 6.79 \log(AHH_{it}) + 0.12 \log(AMH_{it}) + 0.03 \log(TPT_{it}) - 0.52 \log(PnDRBPerKAP_{it}) + \nu_{it} \]

(3.8479)*** (-3.9478)*** (0.0504) (2.2876)** (-6.2445)***

Adjusted R\(^2\) = 0.8735
*** Significant at \(\alpha = 1\%\) level
** Significant at \(\alpha = 5\%\) level respectively

The regression coefficient of -6.79, life expectancy is partially elasticity of poverty to life expectancy. This figure shows that the condition of ceteris paribus, when life expectancy increased by 1%, then the average poverty will decrease by 6.79%. Variable Life Expectancy (AHH) showed a negative and significant effect on poverty in Central Sulawesi. The higher the life expectancy, the level of increased quality of public health. This is consistent with the theory of the cycle of poverty which states that the more qualified public health shown by the increasing life expectancy (AHH). The productivity level increased community can encourage economic growth which in turn will lower the poverty level, meaning that the higher the life expectancy, the poverty rate would decrease. Health development effort is to meet one of the people’s basic rights, namely the right to medical care. Health development is seen as an investment to improve the quality of human resources and support economic development. Life expectancy increased reflecting an improvement in the quality of health districts / city in Central Sulawesi, both of facilities and health services.

Education has an important role in shaping the ability of developing countries to absorb modern technology and develop the capacity to create growth and sustainable development [10]. Education is closely related to poverty. People who are better educated tend to have better income, because highly
educated people have a better chance to get a job with a wage rate that is higher than the less educated. People who have a good level of education have fewer opportunities to be poor than those who educated. One of the few characteristics of literacy education is shown by indicators of literacy rate. The regression coefficient of 0.12 Literacy Rate is partially elasticity of poverty to literacy rate. This figure shows that the condition of ceteris paribus, when the literacy rate rose by 1%, then the average poverty will rise by 0.12%. Based on the survey results revealed that literacy correlated positively and significantly to poverty in Central Sulawesi. This show is not enough to have the ability to read and write one can escape poverty. Someone who can read and write (literacy) if not followed with adequate skills and abilities, not necessarily increase productivity. Someone who has a high productivity will gain a better welfare, so they can get out of the shackles of poverty. Just like [11] identified that increasing family remittance income ($\beta = 0.258$) are the next most important potential means that could be used to address poverty directly, to continue a better social change [12]. This leads us to argue that transfer income can be still considered in maintaining daily life, means helping them move out poverty [13].

The regression coefficient of 0.03 Opened Unemployment Rate is partially elasticity of poverty on Opened Unemployment Rate. This figure shows that the condition of ceteris paribus, when the Opened Unemployment Rate rose by 1%, then the average poverty will rise by 0.03%. The regression results show that the unemployment rate have a positive influence and significant impact on poverty levels in 11 Districts / City in the province of Central Sulawesi. Residents included in the group there are several kinds of opened unemployment rate, those who are looking for work, they are preparing for a business, they are not looking for work because they feel it is impossible to get a job and the last one they already have a job but have not started working.

One of the factors that lead to low levels of the population lives in the province of Central Sulawesi is the lack of efficient use of labor. Residents who have jobs sometimes do not correspond with the level of expertise, so the results are not optimal. This labor is categorized as unemployed apparent. Residents who have high levels of education and skills are low, generally worked odd jobs; it is characterized by the lowest income levels anyway. High population growth rate to encourage the greater number of workers who are unemployed. The government experienced problems of lack of funds or lack of investment levels to absorb the labor force is unemployed.

GDRIP per capita in the region reflect the average income of the community’s ability to meet his needs, especially basic necessities. Fulfillment of basic needs is an indicator of the welfare of the community aspect of income distribution in the region. Poverty levels are not only dealing with aspects of revenue capacity, but also linked to the equal distribution of public revenue in an area [10]. The regression coefficient of Gross Domestic Regional Income Per Capita (PnDRB per capita) of -0.52 is partially elasticity of poverty to PnDRB per capita. This figure shows that the condition of ceteris paribus, if PnDRB per capita rose by 1%, then the average poverty will decrease by 0.52%. The regression results indicate that the Gross Domestic Regional Income per capita (PnDRB) gives a negative and significant effect, according to the hypothesis, and the results. Variable of GDRIP a significant negative effect on poverty. Poverty in Indonesia would be lower if economic growth occurs. The higher the GDRIP growth, the decline in poverty rapidly. Reduction of poverty is almost always followed by an increase in average per capita income or standard of living, and vice versa poverty increases when GDRIP declined.

5. Conclusion

Poverty in the districts / city in Central Sulawesi province in the 2010-2013 periods has decreased every year, but the pace of poverty reduction is quite slow. Life Expectancy and Gross Domestic Regional Income Per Capita have significant negative effect on poverty in the districts / city in Central Sulawesi Province in 2010-2013 periods; The literacy rate has no effect on poverty at the districts / city in Central Sulawesi province in 2010-2013; Opened Unemployment Rate has positive and significant impact on poverty in the districts / city in Central Sulawesi province in 2010-2013 periods; Life Expectancy, Literacy Rate, Unemployment Rate, and Gross Domestic Regional Income Per Capita
have overall effect on poverty. The research suggest that the government may promote health by increasing health facilities evenly, not just concentrated in one area alone, and assign qualified health personnel in areas that are still difficult to reach by rural communities and islands; districts / city in Central Sulawesi province should be able to create quality economic growth. Attempts to do the government is creating jobs in labor-intensive and upgrading the informal sector to reduce poverty in the districts / city in Central Sulawesi, that economic growth is achieved and the problem of unemployment can be reduced.

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