

The Typology of Human Development and Factors That Influence It in West Sumatera

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Abstract. Human development is one of important indicators for the progress of a country if it has the quality. The concept of human development includes 4 important components, namely equality in gaining access to economic and political resources, productivity which is an effort to increase economic activity, empowerment which is an effort to build the quality of society by increasing the potential and ability of them, and sustainable which means that in managing human development capital, it must be able to be utilized in subsequent periods. Human development is a process of improving human ability to develop choices and opportunities. The purpose of this study is to analyze the typology of human development in West Sumatera, and the effect of poverty levels, economic growth, government spending on education and health sectors to the human development index. The analytical method used in this research is using Klassen typology and panel data regression analysis, covering 19 districts and cities in West Sumatera for 7 years of observation, (2010-2016) so that the total number is 133. The data used in this study are secondary data sourced from the Central Statistics Agency (BPS), the Directorate General of Fiscal Balance (DJPK), literature, and articles related to this study.

Keywords: Human development index · Klassen typology · Economic growth · Poverty · Government expenditure

1 Introduction

Development is a multidimensional process that includes changes in social structure, attitudes of society, national institutions, pursuing accelerated economic growth, addressing income inequality, and alleviating poverty (Todaro and Smith, 2006; Erni Febrina, 2018). As a process, development is of course carried out by looking at existing needs while responding to changes that occur in society and the demands of time shift due to the development of civilization, social systems, and more advanced technology. The development paradigm that is currently developing is economic growth as measured by human development as seen by the level of quality of human life as measured through the quality of the level of education, health and purchasing power.

Poverty can be a serious effect on human development because the problem of poverty is a complex problem that actually starts from the inability of people's purchasing power to meet their basic needs and other needs such as education and health. Another factor affecting the human development index is economic growth.

Economic growth shows the extent to which economic activity can generate additional income in a given period. The economy is considered to experience growth when all real service rewards for the use of factors of production in a certain year are greater than the previous year. Government expenditure in the education and health sector is very important in improving the quality of human resources. The better health services and increasing government attention to the quality and quantity of education opportunities for citizens will improve the quality of human resources. And this will increase the value added of the production of goods and services which will also increase economic growth in a region.

2 Literature Review

2.1 Human Development

Human development is a process of enlarging people's choices. The concept or definition of human development basically covers a very broad dimension of development. In the concept of human development, development should be analyzed and understood from its human standpoint, not just from its economic growth. Human development includes the development of population as the center of attention where not only the development of the population in the economic field, but as a whole includes the ability to optimize productivity, equity, sustainability and empowerment.

2.2 Poverty

Poverty is the inability to meet minimum living standards. The problem of low standard of living is related to the amount of income, inadequate housing, poor health and health services, low level of education of the community so that it results in low human resources and increased unemployment (Kuncoro, 2000). The cause of poverty in economic terms is a result of the low quality of human resources, which is caused by low education, and results in low productivity so that wages are also low. This also results in hunger, malnutrition, discrimination, low participation in the decision making process and ultimately the quality of human resources will also be low.

2.3 Economic Growth

Economic Growth is one indicator used to measure a country's economic performance. In actual economic activity, economic growth means physical economic development. Some physical economic developments that occur in a country are the increased production of goods and services, and the development of infrastructure. All of this is usually measured from the development of real national income achieved by a country in a certain period. With the increase in economic growth, it will increase the income per capita of the community so that the HDI in one region actually also increases. Where the higher the national or regional income, the greater the hope for opening new production capacities which of course will absorb new labor. High income is reflected

in high per capita income and positive and meaningful growth. Then the relatively better economic growth, the greater the hope not to be unemployed so that it will encourage the distribution of per capita income so as to encourage an increase in the human development index (Ranis and Steward (2000); Oluwatobi and Olurinola (2011); Erni Febrina, (2017)).

2.4 Government Expenditures in the Education and Health Sector

Investment in terms of education is absolutely necessary, the government must be able to build a means and a good education system. The budget allocation for government expenditure on education is a tangible manifestation of investment to increase community productivity. Development spending on the development sector can be allocated to provide educational infrastructure and provide educational services to the entire population of Indonesia equally. The education budget of 20 percent of the state budget is a form of government realization to improve education (Anisa, et al, 2018). Government spending on the education sector will affect developments in the education sector by increasing the number of students who are able to complete their education to a higher level. The higher the average level of knowledge and skills possessed by the community, the easier it is for every individual of working age to understand, apply and get results from technological advancements and ultimately improve the nation's economic and living standards. A nation must increase investment in education and health to achieve development (Tun Lin Moe, 2008).

Government expenditure on the health sector is an effort to fulfill one of the basic rights of the people, namely the right to obtain health services in accordance with the 1945 Constitution Article 28 H paragraph (1) and UU No. 23 concerning Health (Kuncoro, 2013). Human quality can also be seen from the side of health where health is one of the factors that influence human resources, in other words health aspects also influence human quality. Lack of calories, nutrition, or low health status for the population will result in low human quality with mental retardation. Government expenditure in the health sector seeks to fulfill one of the basic rights in obtaining health services in the form of health facilities and services which are also a prerequisite for increasing community productivity.

3 Methodology

3.1 Klassen Typology

Each region has different economic progress and growth. There are regions that are able to spur economic activities so that they can grow rapidly and there are also regions where the economic cycle has stagnated at one point or even grown negatively. To be able to compare the level of progress of an area with other regions in the same scope of reference, it can be used Klassen Typology as an analysis tool.

y r	$y_i > y$	$y_i < y$
$r_i > r$	Quadrant 1 Fast-Forward and Fast-Growing Areas	Quadrant 2 The Fast Developing Areas
$r_i < r$	Quadrant 3 Depressed Areas	Quadrant 4 relatively disadvantaged area

where: r_i = Economic growth rate of region i
 y_i = IPM region i
 r = Economic growth rate of reference region
 y = IPM reference region

Fig. 1. Regional Classification According to Klassen Typological Analysis.

3.2 Unit Root Test

The basic idea of the unit root test in the panel data is the development of the unit root test in times series, which can be explained in the model:

$$Y_{it} = \rho_t Y_{it} + X_{it} \sigma_{it} + \varepsilon_{it} \tag{1}$$

$i = 1, 2, \dots, n$ (number of individu)

$t = 1, 2, \dots, t$ (number of time)

The ADF root unit test formula is:

$$\Delta Y_{it} = \alpha Y_{it} - 1 + \Sigma \beta F_{if} = 1t f \Delta Y_{it-f} + X_{it} \delta + \varepsilon_{it} \tag{2}$$

Assumed that $\alpha = \rho - 1$ with lag p_i and varies between cross sections.

3.3 Cointegration Test

Cointegration is a long-term relationship between variables which although not individually stationary, but the linear combination between these variables becomes stationary

$$Y_{it} = \alpha_t + \delta_t + \beta_{1t} X_{1it} + \beta_{2t} X_{2it} + \dots + \beta_{Mt} X_{Mit} + \varepsilon_{it} \tag{3}$$

Residual:

$$\varepsilon_{it} = \rho_{it} \varepsilon_{it-1} + U_{it} \tag{4}$$

or

$$\varepsilon_{it} = \rho_t \varepsilon_{it-1} + \Sigma_{f=1}^{p_i} \varphi_{it} \Delta \varepsilon_{it-1} + U_{it} \tag{5}$$

3.4 Panel Multiple Regression

Model: $IPM_{it} = \beta_0 + \beta_1TKM_{it} + \beta_2PE_{it} + \beta_3PPP_{it} + PPK_{it} + \varepsilon_{it}$

where: IPM = Human Development Index
 TKM = Poverty Rate
 PE = Economic Growth
 PPP = Government Expenditure on Education Sector
 PPK = Government Expenditure on Health Sector
 i = regency / city i
 t = year of observation (2010-2016)
 β_0 = Constants
 $\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of independent variables
 ε_{it} = Error term

4 Result and Discussion

4.1 Klassen Typology

Klassen's typology classifies regions based on two characteristics possessed by the area, namely the human development index and the rate of economic growth (Tun Lin Moe, 2008). The results of the Klassen typology calculation can be seen in Table 2 below.

	y	
r	$y_i > y$	$y_i < y$
$r_i > r$	Quadrant 1 Fast-Forward and Fast-Growing Areas (Padang, Solok City, Payakumbuh, Padang Panjang, and Bukittinggi)	Quadrant 2 The Fast Developing Areas (Limapuluh Kota, Dharmasraya, Pasaman Barat)
$r_i < r$	Quadrant 3 Depressed Areas (Sawahlunto, Pariaman)	Quadrant 4 Relatively Disadvantaged Area (Mentawai islands, Pesisir Selatan, Solok Regency, Sijunjung, Tanah Datar, Padang Pariaman, Agam, Pasaman, Solok Selatan)

Fig. 2. Regional Classification According to Klassen's Typological Analysis.

4.2 Unit Root Test

In the unit root test at level (Table 1) there are still not stationary, the unit root test is done with the first difference in table 2.

Table 1. Unit Root Test Results at Level.

Variable	Probability	Description
LIPM	0.0604	Not Stasionary
LTKM	0.0000	Stasionary
LPE	0.0000	Stasionary
LPPP	0.0000	Stasionary
LPPK	0.5289	Not Stasionary

Table 2. Unit Root Test Results at First Difference.

Variable	Probability	Description
LIPM	0.0000	Stasionary
LPPK	0.0000	Stasionary

4.3 Cointegration Test

The next test is Kao Residual Cointegration Test to conclude whether or not there is cointegration.

Table 3. Kao Cointegration Test Results.

	t-Statistic	Prob.
ADF	-3.237875	0.0006

Based on the results of Kao Test (Baltagi, 2005) shows the equation model has a probability of 0.0006 which is smaller than the value of α 0.05. Therefore, based on these values it can be concluded that all the variables tested in this study are cointegrated or have a long-term equilibrium relationship.

Table 4. Estimation Results of Panel Multiple Regression Equation.

Dependent Variable: LIPM
 Method: Panel Least Squares
 Date: 02/10/18 Time: 12:01
 Sample: 2010 2016
 Periods included: 7
 Cross-sections included: 19
 Total panel (balanced) observations: 133

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.228415	0.052241	80.94100	0.0000
LTKM	-0.062508	0.008655	-7.222503	0.0000
LPE	-0.037305	0.012478	-2.989791	0.0034
LPPP	-0.006023	0.003479	-1.731469	0.0862
LPPK	0.024145	0.003925	6.151988	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.991508	Mean dependent var	4.231200
Adjusted R-squared	0.989809	S.D. dependent var	0.084809
S.E. of regression	0.008561	Akaike info criterion	-6.527096
Sum squared resid	0.008063	Schwarz criterion	-6.027261
Log likelihood	457.0519	Hannan-Quinn criter.	-6.323982
F-statistic	583.7676	Durbin-Watson stat	1.497521
Prob(F-statistic)	0.000000		

4.4 Chow Test

To compare or choose which model is best between Common Effect and Fixed Effect then Chow test is done.

Table 5. Chow Test Result.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	351.133660	(18,110)	0.0000
Cross-section Chi-square	541.085572	18	0.0000

Based on the above estimate result note the probability value (Prob.) For cross-section Chi-square. If the value > 0.05 (specified at the beginning as the level of significance or alpha) then the selected model is Common Effect, but if < 0.05 then the selected model Fixed Effect. In the above estimation results show that the value of Prob. Cross-section Chi-square of 0.0000 whose value < 0.05 so it can be concluded that the Fixed Effect model is more appropriate than the Common Effect model.

4.5 Hausman Test

Hausman Test aims to compare or choose which model is the best between Fixed Effect and Random Effect. Then Hausman test with the following estimation results:

Table 6. Hausman Test Result.

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	40.913766	4	0.0000

Based on the above estimation we can see the probability value (Prob.) Cross-section random if the value > 0.05 then the selected model is Random Effect, but if < 0.05 then the selected is Fixed Effect Model.

5 Classic Assumption Test

5.1 Normality Test

Normality test to test whether in the regression model, the data used has a normal distribution or not. The good data are those with normal or near-normal distributions. Where if the probability is greater than the specified alpha then the residual is normally distributed. If the probability is small from the specified alpha then the residual is not normally distributed, Baltagi (2005). Normality Test Results. Based on Jarque-Bera statistic test, the statistic value is 6,186374 with probability that is 0,045357 < alpha 0,05 hence can be concluded that the residual is normally distributed.

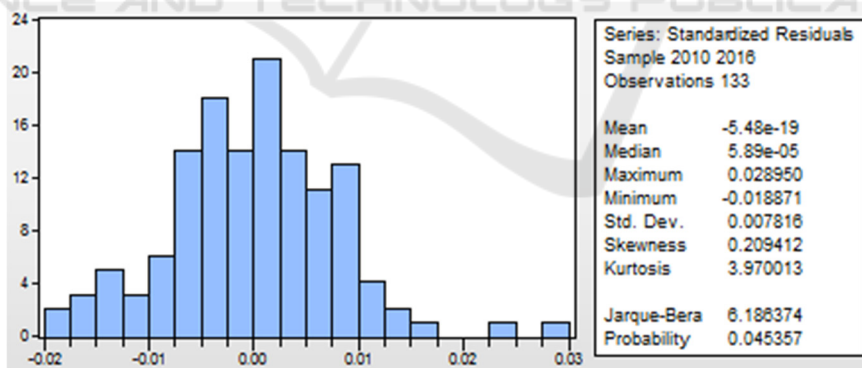


Fig. 3. Normality Test.

5.2 Multicollinearity Test

Multicollinearity test is the situation of correlation of independent variables among each other. Multicollinearity test aims to test whether in the regression model found a

correlation between independent variables. A good regression model should not be correlated between independent variables.

Based on the estimation with multicollinearity test can be seen that the correlation coefficient value is smaller than 0.80 while the rule of thumbs rough rule if the correlation coefficient < 0.80 is assumed there is no multicollinearity. So in this study can be concluded that all independent variables used in this study there is no problem multicollinearity in the model.

Table 7. Multicollinearity Test Results.

Correlation				
	LTKM	LPE	LPPP	LPPK
LTKM	1.000000	-0.155153	0.147755	0.081903
LPE	-0.155153	1.000000	0.031457	-0.154896
LPPP	0.147755	0.031457	1.000000	0.645714
LPPK	0.081903	-0.154896	0.645714	1.000000

5.3 Heteroscedasticity Test

In this study heteroscedasticity test using Glejser method with the result is as follows (table 8), Based on the estimation with heteroscedasticity test by looking at the t test the coefficient of LTKM, LPE, LPPP, LPPK individually did not significantly affect the dependent variable RESABS, with probability value $> \alpha = 0.05$. Based on these results, it can be concluded that in the model used there is no problem of heteroscedasticity.

Table 8. Heteroscedasticity Test Results.

Dependent Variable: RESABS
 Method: Panel Least Squares
 Date: 02/10/18 Time: 13:04
 Sample (adjusted): 2011 2016
 Periods included: 6
 Cross-sections included: 19
 Total panel (balanced) observations: 114

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011164	0.011375	-0.981470	0.3290
LTKM	0.001512	0.002112	0.715769	0.4760
LPE	-0.001414	0.003179	-0.444701	0.6576
LPPP	0.000869	0.000736	1.180914	0.2407
LPPK	0.000203	0.000848	0.239211	0.8115

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.167877	Mean dependent var	0.002421
Adjusted R-squared	-0.033296	S.D. dependent var	0.001678
S.E. of regression	0.001705	Akaike info criterion	-9.731795
Sum squared resid	0.000265	Schwarz criterion	-9.179755
Log likelihood	577.7123	Hannan-Quinn criter.	-9.507753
F-statistic	0.834491	Durbin-Watson stat	2.253041
Prob(F-statistic)	0.676171		

6 Conclusion

1. Typology Klassen classifies Regencies and Cities in West Sumatera there are four characteristics, namely, First, Fast-Forward and Fast-Growing Areas (Quadrant I): Padang, Solok City, Padang Panjang, Bukittinggi, and Payakumbuh. Second, the Fast Developing Areas (Quadrant II): Limapuluh Kota, Dharmasraya, and Pasaman Barat. Third, Depressed Areas (Quadrant III): Sawahlunto and Pariaman. And Fourth, Relatively Disadvantaged Areas (Quadrant IV) include the Mentawai Islands, Pesisir Selatan, Solok, Sijunjung, Tanah Datar, Padang Pariaman, Agam, Pasaman and Solok Selatan.
2. Based on the result of regression equation of panel data of independent variable of poverty level have negative and significant influence to index of human development. If the level of poverty declines, will increase the human development index. This is in accordance with Bauer's theory in Ifionu & Nteegah (2013). Likewise, government health expenditure variables that have a positive and significant impact on the human development index. If public health spending increases, will be reflected in an increase in the human development index. This is in accordance with the theory of Strauss and Thomas in Todaro (2003). While the variable of economic growth have negative and significant effect to human development index. The results of this analysis do not fit with Harrod-Domar's theory in Todaro (2015). This is because the increase in the index of human development is not solely on economic growth. In order for economic growth in line with human development, economic growth must be accompanied by equitable development. With equity of development there is a guarantee that all residents can enjoy the results of development. Government expenditures on education sector have a negative and significant impact on the human development index. If government spending in the education sector increases then the human development index will decline. The results of this analysis do not match the theory put forward by Ejiogu, (2011). This is caused by the poor education system and the ineffectiveness of the government budget allocation in the education sector, especially related to the high number of corruption. Where there is a tendency for corruption to occur on the side of school facilities and infrastructure. (ICW, 2015).
3. From F-Statistic test result of regression Probability F-Statistic 0,000000 and this result compared with alpha 5% (0.05) so it can be concluded as a whole independent variable have significant effect to index of human development.

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