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Original Article

The Impact of Human Development Index on Poverty in Southeast Sulawesi

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Abstract *- This study aims: to investigate the effect of education, health and economic dimensions on the human development index and its impact on poverty. This type of data uses secondary data, namely panel data with district and municipal analysis units in Southeast Sulawesi and in 2010-2018. The results of the analysis use the structural equation model of the Partial Least Square (PLS) approach. This study concludes That the human development index has a negative and significant effect on poverty, of the three dimensions that affect the human development index, the dominant educational dimension affects the human development index and poverty in Southeast Sulawesi.*

Keywords *- Human Development Index, Poverty, SEM-PLS.*

I. INTRODUCTION

Poverty is related to the problem of inadequate income and wealth to meet basic needs such as food, clothing, housing, education and health levels. Poverty is related to asset ownership, which includes: human assets, natural assets, physical assets, financial assets, and social assets [1].

Discussing the theory of poverty and overcoming it certainly cannot be separated from two major paradigms, namely: the neo-liberal and social democracy paradigm. The main focus of the neo-liberal paradigm: the problem of poverty and its measurement based on the perspective of income poverty using income as the only indicator of the poverty line. On the contrary, the paradigm of social democracy: considers that the problem of poverty is a structural problem. Equality is an important prerequisite to obtaining independence and freedom to reach sources for his potential, such as education, good health and sufficient income [2].

This research uses the social democracy paradigm to analyse the problem of poverty, so poverty alleviation itself is certainly related to the quality of human resources. In Indonesia, the indicator used is the Human Development Index. According to UNDP, the Human Development Index (HDI) measures human development achievements based on a number of basic components of quality of life. As a measure of the quality of life, HDI is built through a basic three-dimensional approach, namely longevity and health, knowledge, and a decent life. To measure the dimensions of health, life expectancy at birth is used. Next, to measure the dimensions of knowledge using a combination of indicators of long school expectations and the average length of the school. As for measuring the dimensions of life, feasible indicators of purchasing power are used. The ability of people's purchasing power to a number of basic needs as seen from the average amount of expenditure per capita as an income approach that represents development achievements for a decent life (The Central Bureau of Statistics, 2018).

This research is an elaboration of [3]and [4] models. Both researchers used the Human Development Index. [4],The Human Development Index variable is measured in three dimensions, namely economics, education, and health which will be used as latent variables that affect the Human Development Index directly and indirectly. The recommendation is that the model is built quite well in explaining the diversity of the Human Development Index. The results of this study indicate that economics and health have a significant direct effect while education has a significant indirect effect on the Human Development Index mediated by latent variables economy. At the same time, [3]research recommends that to reduce poverty in the Indonesian province should improve Human Development Index (HDI).

The results of empirical studies [5] find that education has a significant influence on poverty and is contradictory to research [6]. Furthermore, research results[7] found that HDI had a significant effect on poverty. At the same time, research [8] found that HDI has no significant effect on poverty.

Based on the results of theoretical and empirical reviews that have been put forward, the authors are interested in doing research again by elaborating the research recommendations of [3] and the [4], which uses structural equation models with Part Least Square (PLS). Structural Equation Model to identify the factors that influence the Human Development Index based on District and City data in Southeast Sulawesi Province.

The main objective of this study was to determine the effect of the Human Development Index on poverty in the Districts and Cities in Southeast Sulawesi in 2010-2018. The specific objectives of this study are:

i. Investigate the influence of the educational, health and economic dimensions on the Human Development Index
ii. Investigate the role of mediation dimensions of health and economics in the influence of the educational dimension on the Human Development Index
iii. Investigate the influence of the Human Development Index on poverty

The following formulated hypotheses were used for the study

H_{o1}: The influence of educational, health and economic dimensions has no significance on the human development index.

H_{o2}: The role mediation of health and economic dimensions in the influence of the education on human development index.

H_{o3}: The influence of the human development index has no significance on poverty.

II. CONCEPTUAL FRAMEWORK

A. Concept of Human Development Index

According to UNDP, the Human Development Index (HDI) measures human development achievements based on a number of basic components of quality of life. As a measure of the quality of life, HDI is built through a basic three-dimensional approach. These dimensions include long and healthy life, knowledge, and a decent life. These three dimensions have a very broad understanding because they are related to many factors. To measure the dimensions of health, life expectancy at birth is used. Next, to measure the dimensions of knowledge using a combination of indicators of long school expectations and the average length of the school. As for measuring life dimensions, it is appropriate to use the purchasing power indicator (Purchasing Power Parity). The ability of people's purchasing power to a number of basic needs as seen from the average amount of expenditure per capita as an income approach that represents development achievements for a decent life (Central Bureau of Statistics, 2018).

The formula used in calculating the HDI component index is as follows:

$$I_{UHH} = \frac{UHH - UHH_{min}}{UHH_{maks} - UHH_{min}}$$

$$I_{HLS} = \frac{HLS - HLS_{min}}{HLS_{maks} - HLS_{min}}$$

$$I_{RLS} = \frac{RLS - RLS_{min}}{RLS_{maks} - RLS_{min}}$$

$$I_{knowledge} = \frac{I_{HLS} - I_{RLS}}{2}$$

$$I_{pengeluaran} = \frac{ln(expenditure) - ln(expenditure_{\min})}{ln(expenditure_{maks}) - ln(expenditure_{min})}$$

To calculate the index of each HDI component, the maximum and minimum limits are used, as shown in the table.

Table.Maximum and Minimum Values of each HDI Component

HDI Component	Unit	Minimum	Maximum
Life Expectancy at Birth (AHH)	Year	20	85
Hope in Old School (HLS)	Year	0	18
Average length of school (HLS)	Year	0	15
Pengeluaran per Kapita	IDR	1.007.436	26.572.352

Source: Central Bureau of Statistics(2018)

Health Dimension

Preston's (2004) explains that Life Expectancy at birth is: the estimated average length of time that can be trave by a person during life. The type of data used is Children Born Alive and Children Still Alive.

Education Dimensions

Components forming HDI are dimensions of knowledge measured through the level of education. In this case, the indicators used are: mean years of schooling and expected years of schooling. In the process of forming HDI, the average of length schooling and long term expectations of schools are of equal weight. The average length of school is the number of years used by residents aged 25 years and over in undergoing formal education. Maximum limit Average length: 15 years and minimum limit of 0 years. Long school expectations are defined as the length of school (in years) that is expected to be felt by children at a certain age in the future. Expectations of school duration: calculated for residents aged over 7 years.

Economic Dimensions

The standard of living is decent: describing the level of welfare enjoyed by the population as a result of the economic improvement. [1]: measures the standard of living worth using the adjusted Gross National Product (GNP) per capita, while BPS in calculating the standard of living worth using average real

expenditure per capita adjusted to the purchasing power parity by Rao formula:

$$PPP_j = \prod_{i=1}^{m} \left(\frac{\rho_{ij}}{\rho_{ik}}\right)^{1/m}$$

Note:
PPP_j: paritas daya beli di wilayah j
p_{ij} : harga komoditas i di kabupaten/kota j
p_{ik} : harga komoditas i di Sulawesi Tenggara
m : number of commodities

B. Concept of Poverty

[1], poverty, especially in rural poverty, is a problem of powerlessness, isolation, vulnerability and physical weakness, where one another is interrelated and influential. However poverty, according to Chambers, poverty is a strong determinant of the others.

Poverty contributes to physical weakness by means of lack of food, thin body, poor nutrition, which makes it susceptible to infection (disease), an inability to pay for services or health services. Poverty: the inability to pay for education costs, buy a radio or bicycle to travel to work, or to live near the village centre or main road. In addition, poverty also contributes to vulnerability through the lack of assets to pay for greater expenditures or to meet the needs of contingencies; and poverty also contributes to powerlessness due to the lack of wealth that occurs together with the low status (the poor have no voice).

The physical weaknesses of a household can contribute to poverty: low productivity from a weak workforce. Isolation means lack of education, remoteness, and lack of contact with the outside world. Vulnerability: associated with poverty, physical weakness, isolation, and disability. In short, the linkages between various aspects of poverty or what [9]called the "clusters of disadvantage" cluster formed an "endless cycle of poverty" (the vicious circle of poverty) or the deprivation trap".

In general, poverty can be divided into two types: absolute poverty and relative poverty. Absolute poverty: income inadequacy to meet the minimum needs. Poverty can be measured by comparing the level of income of the person or family with the level of income needed to obtain the minimum basic needs. The minimum income level is the boundary between poor and non-poor conditions or the poverty line. To measure poverty, there are several measures or indices that are often used by experts so far, including: (1) Poverty Headcount Index (P0): which is a rough measure of poverty because it only refers to the proportion of the population living below the poverty line. In other words, this measure only sums up how many poor people there are in the economy. Then the percentage is made to the total population. With this measure, every poor person has the same weight. If this measure is used by the government as a policy base, it will produce a biased policy because, in the eyes of the government as a policy maker, all poor people have the same weight of poverty; (2) Poverty gap index (P1), which measures the depth of poverty within an area, and this index estimates the distance or difference in an average income of the poor from the poverty line as a proportion of the poverty line; (3) Squared poverty gap (P2) which shows the severity of poverty in an area. The P2 Index is the average of the squared poverty gaps. This index is often also called the poverty severity index (Central Bureau of Statistics, 2018)

III. EMPIRICAL REVIEW

[4],applies PLS-SEM to identify the factors that influence the Human Development Index based on provincial data in Indonesia. The Human Development Index consists of three dimensions, namely Economy, Education, and Health which will be used as latent variables that affect the Human Development Index directly and indirectly. The results of this study indicate that Economics and Health have a significant direct effect while Education has a significant indirect effect on the Human Development Index mediated by latent variables Economy. The model tested in this study was evaluated using a Q^2 value of 67%, which indicates that the model constructed was quite good in explaining the diversity of the Human Development Index.

[3], The results of the study using PLS based on the model and parameter feasibility test prove statistically that: (1) Poverty Rate and Quality of Life as measured by the Human Development Index in Indonesia influence each other very significantly with large effect sizes (2) The Effect of Poverty on HDI is statistically the same the Effect of HDI on Poverty. In connection with the two conclusions above, the Government as the organizer of the State, can take two approaches, namely first reducing poverty to improve the quality of life of the Indonesian population or improve the quality of life first so that poverty is reduced. The recommendation of this study is to improve HDI first.

[5], this study aims to determine the factors that influence the Human Development Index of North Tapanuli Regency directly and indirectly with path analysis. The research found: literacy rates and life expectancy directly had a significant effect on the human development index

[6], this study aims to determine the effect of employment, education and health opportunities on poverty in Aceh. The study found: that employment,

education and health opportunities had a significant negative effect on poverty levels in Aceh Province.

[7], this study aims to determine the effect of the Human Development Index (HDI) on poverty levels in Bali. Using primary data, and analyzed with regression multiple. Research findings: The human development index has a significant effect on poverty in Bali.

[8], this study aims to determine the effect of the Human Development Index (HDI) and Gross Domestic Product (GDP) on poverty levels in ASEAN-4. Data using panel data and analyzed with panel data regression Ordinary Least Square method. Partial test results: human development index is negative and not significant to poverty, and GRDP has a negative and significant effect on poverty in ASEAN countries.

[10], the purpose of this study is: to investigate the effect of economic growth, direct expenditure and human development index in Jambi Province. Data using panel data and analyzed with random effect panel data regression. Partial test results: Economic Growth (PER) has a negative effect on poverty while the Human Development Index (HDI) and Direct Expenditures (BL) have a positive and not significant effect on poverty. Simultaneous test results: Economic Growth (PER) and Human Development Index (HDI) and Direct Expenditures (BL) significantly influence the development of poverty (Y) districts/cities in Jambi Province.

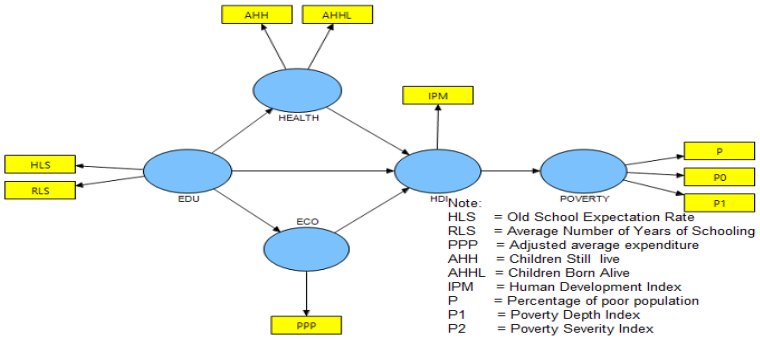
IV. RESEARCH METHODOLOGY

A. Data

This study uses secondary data in the form of panel data, which consists of cross-section data, namely 12 districts and cities in Southeast Sulawesi consisting of 10 districts (Buton, Muna, Konawe, Kolaka, South Konawe, Bombana, Wakatobi, North Kolaka, North Buton, North Konawe, East Kolaka, Konawe Kepulauan) and 2 Cities (Kendari and Bau-Bau). And time series data, namely 2014-2018. The secondary data in question are historical data on the dimensions of education, health, economic, Human Development Index, and Poverty in district and city of the Southeast Sulawesi in 2010-2018.

B. Model Specification

Fig. 1 Path Models Based on Theory



C. Good of Fit Models

Evaluation of Good of Fit Models uses AVE parameters (average variance extracted), composite reliability, R square and Cronbach's alpha. Cut-offs of the four parameters are shown in Table I.

Table 2. Good of Fit Models Criteria

Parameters	OuterModels	Inner Models	Note
AVE		≥ 0.5	Fairly
ρc = Composite Reliability		0.6 – 0.79	Fairly
R^2		≥ 0.7	Strong
Reliability α Cronbach		≥ 0.5	Good
Lambda – λ (loading factor)	0.5 – 0.69		Fairly
t – statistics (Bootstrapping)		t > 1.96	Significant

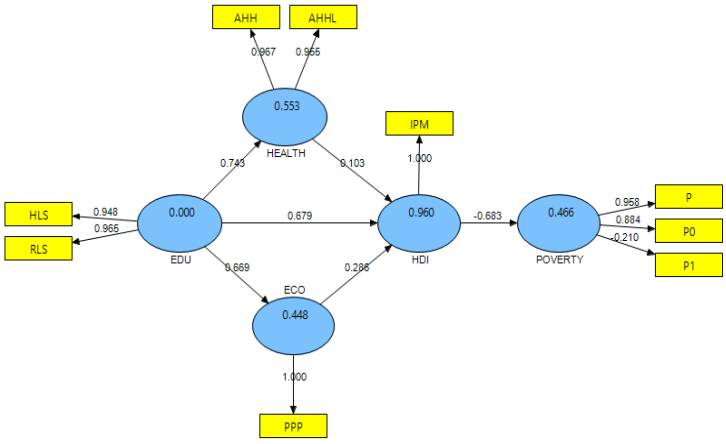
Source: [11]

Strategi analisis untuk membuktikan hipotesis, maka langkah-langkah analisis adalah: (1) menghitung koefisien jalur dengan Smart-PLS; (2) Goodness of Fit Models; (3) Statistical Test of Hypotheses.

V. RESULT AND DISCUSSION

A. PLS-Algorithm Result

Fig. 2 Result of Path Models



B. Goodness Fit Measurement Models

Evaluation of the measurement model of latent variables is done by testing the loading factor value of each indicator of the latent variable. The indicator is said to be valid if the loading factor value is greater than 0.5. PLS-Algorithm output results are shown in Table II.

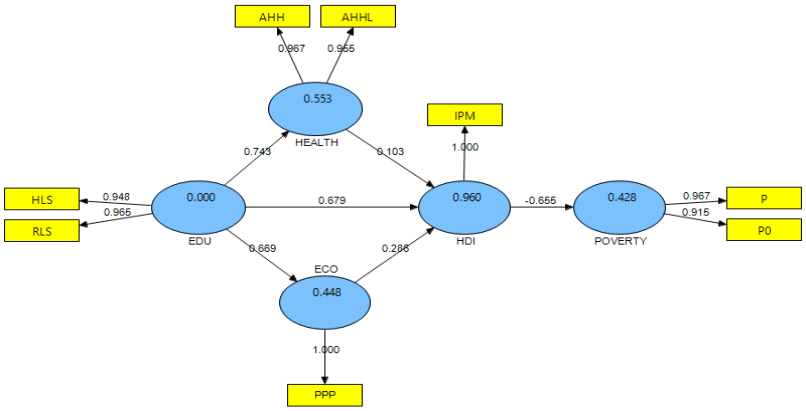
Table II Loading Factor Latent Variables

	Loading Factor (λ)	Conclusion
HLS <- EDU	0.948	Valid
RLS <- EDU	0.965	Valid
AHH <- HEALTH	0.967	Valid
AHHL <- HEALTH	0.955	Valid
PPP <- ECO	1.000	Valid
IPM <- HDI	1.000	Valid
P <- POVERTY	0.958	Valid
P0 <- POVERTY	0.884	Valid
P1 <- POVERTY	-0.210	Not Valid

Source: Author Computation, 2019 (Smart-PLS 2.0)

Table III shows that there is one indicator of the latent variable of poverty which has a loading factor value smaller than 0.5 (P1). Therefore these indicators must be issued in the model of measuring poverty variables. Then an analysis with PLS-Algorithm was performed again, and the results are seen in Figure 3.

Fig. 3 Result of PLS Models after Modification



C. Goodness Fit Structural Models

Evaluate the structural model by looking at the value of AVE, composite reliability, R Square, and Cronbach's alpha. The results of the four parameters are shown in Table IV.

Table 4. Result of Goodness Fit Models

	AVE	Composite Reliability	R Square	Cronbach's Alpha

EDU	0.915	0.956	0.000	0.908
ECO	1.000	1.000	0.448	1.000
HDI	1.000	1.000	0.960	1.000
HEALTH	0.923	0.960	0.553	0.917
POVERTY	0.887	0.940	0.429	0.879

Source: Author Computation, 2019 (Smart-PLS 2.0)

Table III shows that all structural model test parameters are met. This means that the research model matches the data. R Square value of the latent variable HEALTH 0.553 means that the ability of the latent educational variable explains the change in the HEALTH latent variable by 55.3%. R square value of ECO 0.448 means that the ability of the EDU latent variable to explain changes in ECO is 44.8%. Furthermore, the R square value of the human development index is 0.960 and poverty is 0.429, which means the ability of the EDU, HEALTH and ECO variables to explain the change in HDI is 96.6% and the ability of HDI to explain the change in the poverty variable is 42.9%.

D. Statistical Test of Hypotheses

The first and second hypothesis testing is done by comparing the t-statistic value with the Z-score (95% = 1.96). The null hypothesis is rejected if the t-statistic value is greater than 1.96. The third hypothesis compares the total direct effect and the total indirect effect of the EDU variable on HDI. If the total direct effect is smaller than the total indirect effect, then the null hypothesis is rejected. The t-statistic value obtained from the Smart-PLS calculation using the bootstrapping method is shown in Tables IV and V.

Table 5. total Direct Effect

	Path Coefficient	Total Effect	T Statistics	Conclusion
ECO -> HDI	0.286	0.286	4.473	Significant
HEALTH -> HDI	0.103	0.103	4.063	Significant
EDU -> HDI	0.679	0.947	79.388	Significant
HDI -> POVERTY	-0.683	-0.608	9.512	Significant

Source: Author Computation, 2019 (Smart-PLS 2.0)

Table 6. Total Indirect Effect

	Total Effect	T Statistics	Conclusion
ECO -> POVERTY	-0.1739	4.9802	Significant
EDU -> POVERTY	-0.5755	8.7398	Significant
HEALTH -> POVERTY	-0.0626	4.1724	Significant

Source: Author Computation, 2019 (Smart-PLS 2.0)

Hypothesis one

H_{o1}: The influence of the Human Development Index has no significance on poverty.

From Table V, the results of the t-statistical calculation of the effect of the human development index on poverty are 9,512. This value is greater than the Z-scores at alpha 5% (1.96) and therefore rejects the null hypothesis. It can be concluded that the human development index has a significant influence on poverty in Southeast Sulawesi.

Hypothesis two

H_{o2}: The influence of educational, health and economic dimensions has no significance on the Human Development Index.

From Table V, the t-statistic results of the influence of education, health, and economy on the human development index are 79,388, 4,063 and 4,473. This value is greater than the Z-scores at alpha 5% (1.96) and therefore rejects the null hypothesis. It can be concluded that the influence of educational, health and economic dimensions has a significant influence on the human development index in Southeast Sulawesi.

Hypothesis three

H_{o3}: The role mediation of health and economic dimensions in the influence of the educational on Human Development Index.

From Table V, the results of the calculation of the total direct effect of education on the index of human development through health and economy are 0.769 and 0.847. At the same time, the total direct effect of education on the human development index is 0.947. Because the total direct effect is greater than the total effect of the direct action, it is concluded that there is no indirect effect on the health and economic dimensions of the human development index in Southeast Sulawesi.

VI. DISCUSSION AND FINDING

The findings of this study are: the human development index has a negative and significant

effect on poverty in Southeast Sulawesi. Other findings are: education, health, and economic dimensions have a significant effect on the human development index. These three dimensions, the dimensions of education, are the most powerful influence on the human development index. This statement was confirmed from the total effect of 0.947 (94.7%) on the human development index. Next in a row are economical and health dimensions.

This study found that the magnitude of the effect of the human development index on poverty was: 42.8%. This means that the diversity of poverty that can be explained by the human development index is: 42.8%. The educational dimension is: has a dominant influence compared to the health and economic dimensions (Table VI). The implications of this finding are: poverty alleviation in Southeast Sulawesi can be done by increasing the human development index, and the main focus is the educational dimension. The results of this study are in line with [4] and [7]. In contrast to[8], who found that the human development index was not significant for poverty.

Other findings are: economic and health dimensions do not play a mediating variable between the influence of the education dimension on the human development index. This finding is confirmed by the total direct influence of the educational dimension is greater than the total effect of the economic or health dimension. The implication of this finding is: that the human development index dimension is a unity, and to increase the human development index, the three dimensions must be carried out simultaneously with a higher proportion in the education dimension.The results of this study are in line with [4], [6]and contradict the research[10] and[8]yang menemukan bahwa IPM berpengaruh tidak signifikan terhadap kemiskinan.

VII. CONCLUSION

This study concludes that: the human development index has a significant effect on poverty. Of the three dimensions that affect the human development index: the educational dimension had a dominant influence on poverty in Southeast Sulawesi in 2010-2018. But this study also concluded: that there is no mediating role of the health and economic dimensions on the human development index.

Based on the findings of this study, the researchers' recommendations are: to reduce poverty in Southeast Sulawesi, the regional government's policy priorities are in the education sector through programs related to improving the quality of education.

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