

Human Development Index Issue In West Sumatra

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ABSTRACT:- This study aims to analyze the influence and balance, poverty, local income and unemployment on the Human Development Index (HDI) in West Sumatra Province. The data used is panel data, which is a combination of time series data (2010-2021) and cross section data (11 regencies) in West Sumatra. Analysis techniques using Ordinary Least Squares regression (OLS). The results of the model selection test through the Chow test, Hausman test and lagrange multiplier test are fixed effect models. Fixed effect model based on the test results of classic assumptions is already the right and valid model for analysis. The results of the analysis showed that Balance Fund (BF_{t-1}) and Local Original Income (LOI_{t-1}) had a positive and significant effect on the Human Development Index (HDI), while Poverty (PV_{t-1}) and Unemployment (UEP_{t-1}) had a negative and significant effect on the Human Development Index (HDI). The variation in the influence of the variables Balance Fund (BF_{t-1}), Poverty (PV_{t-1}), Local Original Income (LOI_{t-1}) and Unemployment (UEP_{t-1}) on the Human Development Index (HDI) was 88.41 percent and the remaining 11.59 percent was influenced by other variables not studied in this study.

Keywords: Panel Data, Ordinary Least Squares regression (OLS), Balance Fund (BF_{t-1}), Poverty (PV_{t-1}), Local Original Income (LOI_{t-1}), Unemployment (UEP_{t-1}) and Human Development Index (HDI).

I. INTRODUCTION

The United Nations Development Programme (UNDP) in 1990 introduced the Human Development Index (HDI) as an indicator to measure the progress of Human development. The indicators used at the time were longevity, healthy living, knowledge, decent living standards which were published periodically every year in the UNDP Human Development Report. The concept of human development initiated by UNDP has been widely adopted by various countries including Indonesia. Indonesia applied the concept of human development which was considered more relevant than the conventional development concept in 1996 and at that time the concept of human development index was calculated by Indonesia periodically once every 3 years. Starting in 2004 to meet the needs of the Ministry of Finance in calculating the General Allocation Fund (DAU) the human development index is calculated annually.

In 2010, UNDP officially introduced the calculation of HDI with a new method, namely the indicators used for the old expectations, the average length of schooling, the Gross National Product (GNP) per capita, while Indonesia implemented the new method in 2014 by replacing the Gross National Product per capita indicator with per capita expenditure. The development of the Human Development Index in Indonesia in 2021 based on Indonesia's statistical data is 72.29, which is an increase of 0.49% compared to 2020. This increase was due to an increase in the value of the indicators used compared to the previous year. The value of Indonesia's Human Development index is in the high category, which is between 0.700 - 0.799 (statistics UNDP).

Indonesia is located on the Indo Australia, Eurasian, and Pacific Plate plates. The Indo-Australian Plate collides with the Eurasian Plate off the coast of Sumatra, Java, and Nusa Tenggara. The Pacific Plate collides with the Eurasian Plate in the north of New Guinea and North Maluku and its area reaches 5,180,053 km², consisting of a land area of 1,922,570 km² and an ocean area of 3,257,483 km² with an island in Indonesia reaching 16,056 (5 large islands). One of the 5 large islands is Sumatra with an area of 473,481 square kilometers. The island of Sumatra consists of 10 provinces and one of them is West Sumatra.

West Sumatra has an area of 42,012.89 km² which is divided into 12 regencies and 7 municipalities. In 2020, the total population was 5,534,472 people with a GRDP value of Rp 169,416,718 (in millions). The overview of the Human Development Index of Indonesia, West Sumatra and several regencies in West Sumatera is as follows:

Table 1. Human Development Index (HDI) Indonesia, West Sumatra and Several Districts in West Sumatra in 2017-2021

No.	Information	Year				
		2017	2018	2019	2020	2021
1	Indonesian	70,81	71,39	71,92	71,94	72,29
2	West Sumatra	71,24	71,73	72,39	72,38	72,65
3	Mentawai Island	59,25	60,28	61,26	61,09	61,35
4	South Pesisir	68,74	69,4	70,08	69,90	70,03
5	Solok Regency	68,74	68,6	69,08	69,08	69,24
6	Sijunjung	66,60	66,97	67,66	67,74	67,86
7	Tanah Datar	70,37	71,25	72,14	72,33	72,46
8	Padang Pariaman	68,90	69,71	70,59	70,61	70,76
9	Agam	71,1	71,7	72,37	72,46	72,57
10	Lima Puluh Kota	68,69	69,17	69,67	69,47	69,68
11	Pasaman Regency	64,94	65,60	66,46	66,64	66,77
12	South Solok	67,81	68,45	68,94	69,04	69,23
13	Dharmasraya	70,4	70,86	71,52	71,51	71,76
14	West Pasaman	66,83	67,43	68,21	68,49	68,76

Source : BPS Indonesia and West Sumatra

Based on the table above, it illustrates in the Human Development Index in Indonesia, West Sumatra and regencies in West Sumatra. The picture can be reflected in the state of a country/region about its human development, especially reflecting the achievements of progress in the fields of education, health, and economy. Looking at the Human Development Index figures in the table above, it is still below the Indonesian average, so that human development can still be explored and explored, showing a significant Human Development Index.

According to several research results, efforts to explore and explore human development so as to produce a significant Development Index in a country including: (1) Yakunina R.P and Bychkov G.A (2015) stated that GNI per capita, education index, innovation index, ICT Development Index and life expectancy index show excellent descriptive ability of the model against the Human Development index. (2) Y. Yolanda (2017) states that inflation has a significant effect on the Human Development index. (3) Yolanda *et al.*, (2020) stated that the Gini Ratio and Criminality have a significant effect on the Human Development Index. (4) Maria Daniela Tudorache (2020) stated that Corruption_{t-1}, Employment_{t-1}, and Education (early leavers and life expectancy) has a significant effect on the Human Development Index. (5) Sumarni *et al.*, (2021) state that the Human Development index can be influenced by education, poverty and unemployment.

Based on this, this study wants to see the influence of the Equalization Fund, Regional Native Income, Poverty and unemployment on the Human Building Index in the Regencies of West Sumatra Province both simultaneously and partially and with all its problems.

II. LITERATURE REVIEW

The Human Development Index was introduced by the United Nations Development Programme (UNDP). In its application, the United Nations Development Programme (UNDP) through its Human Development Report in 2010 made changes to the measurement indicators, namely: 1. The Aggregation of Literacy Numbers and the combination of Gross Participation Numbers were changed to the aggregation of Average Length of Schooling and Old Hope of School; 2. Per capita Gross Domestic Product is converted into the Gross National Product (GNP). In 2014 the method of calculating the average education index from geometric to arithmetic average with the classification of the Human Development Index (HDI) assessment can be grouped on: (a) HDI value < 60 (low); (b) HDI value : $60 \leq \text{HDI} < 70$ (medium); (c) HDI value : $70 \leq \text{HDI} < 80$ (high); d) HDI value ≥ 80 (very high). The Human Development Index value can describe the success of development (Maulana and Bowo; 2013), the level of welfare (Aji *et al.*; 2014), and the availability of job opportunities (Irmayanti; 2017). Meanwhile, the Human Development Index is a benchmark in achieving quality human development (Yolanda; 2017).

The Balance Fund is a fund sourced from state budget revenues allocated to regions (autonomous) to fund regional needs in the context of implementing Decentralization regulated in Government Regulation Number 55 of 2005 consisting of profit sharing funds, general allocation funds and special allocation funds. The equalization fund aims to support the implementation of the authority of regional governments in improving community services and welfare in accordance with the Regional Autonomy Law, namely Law No. 25 of 1999 which has been refined by Law No. 33 of 2004. In addition, this financial balance policy aims to (a) provide a

source of funds for autonomous regions (b) reduce fiscal inequality; (c) improving welfare and public services; (d) improve the efficiency, effectiveness and accountability of regional resource management, especially financial resources. According to Rudy Badrudin and Irawan Kuncorojati (2017), the balance fund supports the implementation of local government authority to achieve improved services and community welfare. The relationship between this balance fund and the human development index is because the balance fund is used to finance human development programs in the regions that can increase the human development index. With the existence of sufficient balance funds and fixed targets, it is expected that the development index will increase. Research that discusses this relationship includes Yanseni Y. Y and Marhaeni A. A. I. N (2019).

Poverty, according to Yolanda *et al.*, (2020) is a very significant problem for all countries in the world because it is the inability of the population from the economic side to meet its basic needs. While law No. 13 of 2011, the poor are people who do not have a source of livelihood or have a source of livelihood but cannot meet the basic needs suitable for their own and their families' lives. Patria Nagara *et al.*, (2021) measure poverty with the concept of the ability to meet basic needs (basic needs approach). The method of calculating the Poverty Line (PL) is the summation of the components of the Food Poverty Line (FPL) and the Non-Food Poverty Line (NFPL), with the following formula:

$$PL = FPL + NFPL$$

The Human Development Index and poverty are closely related, as HDI is measured by the main indicators, namely life expectancy, education level, per capita income, while poverty can affect all these HDI indicators. Therefore, the higher the poverty rate in a country, the lower the HDI. Conversely, the lower the poverty rate, the higher the HDI. In this case, the reduction of poverty becomes an important factor to increase the HDI of a country. Research from several researchers discussing the relationship between poverty and the Human Development Index including: Jihad Lukis Panjawa and Bhimo Rizky Samudro (2021), Nuke Amalia *et al.*, (2020), regina *et al.*, (2020), Baqtiar & Murjani (2017), suwandi (2017) and Farida Rahmawati *et al.*, (2012), poverty has a negative and significant effect on the human development index.

Local original Income based on article 6 of Law No. 33 of 2004 states that Local Native Income is sourced from local taxes, regional levies, the proceeds of regionally owned companies and the results of the management of segregated regionally owned assets, as well as other legitimate local original income. In addition, local original income is a regional business to reduce dependence in obtaining funds (subsidies) from the central government or according to Djaenuri (2012) states regional revenues that come from the area itself and it consists of regional revenues sourced from local taxes, regional levy proceeds, segregated regional wealth management results and other legitimate local revenues (Budi S. Purnomo; 2009, Rahmad *et al.*; 2019, Erlina; 2015). According to Noor Farieda Awwaliyah *et al.*, (2019), the ability to extract Local Revenue will affect the development of the area itself and this reflects the government's performance better. In addition, the increase in Local Original Income through Regional Taxes, Regional Levies, Separate Regional Wealth Management Results, and Other Local Original Income that is valid to the maximum or by expanding other local tax objects can be carried out by the local government. The relationship between local indigenous income and the Human Development Index is very close, because the amount of regional native income shows the ability of local governments to provide public services such as health, education, and infrastructure needed by the community. Research related to Local Original Income and Human Development Index including Eva Wulandari *et al.*, (2018) stated that Local Original Income has a significant effect on the Human Development index. Oktarini Khamilah Siregar (2022), Local Original Income has no significant effect on the Human Development index. Meanwhile, TB. M. Ali Ridho Azhari *et al.*, (2021) showed that Local Original Income has a positive effect on the Human Development Index.

Unemployment according to Sukirno (2008), there is a situation where a person who belongs to the labor force wants to get a job but has not and Sumarsono (2009) states that unemployment occurs due to a discrepancy between demand and provision in the job market. The imbalance between the demand and supply of labor is caused by a relatively lower increase in demand compared to the increase in supply. This will result in a new level of equilibrium in the market with a low wage rate that is based on low purchasing power as well. In addition, unemployment can reduce individual and family opinions, which in turn will affect health, education and other welfare. Both unemployment can reduce a Country's productivity and economic growth and ultimately affect the country's ability to provide health and education services. Several studies state that unemployment has a significant effect on the Human Development Index including Meydiasari & Soejoto (2017) and Rita Herawaty Bangun (2021). While Arisman (2018), stated that the unemployment rate and human development index (HDI) had no significant effect.

III. METHODOLOGY

Analysis used in this study is a quantitative method based on secondary data. This research is done by study literature, data presentation, and views presented in tables and data analysis. The variables in this study

consist of dependent variables (Human Development Index) and independent variables (balance funds, Local original Income, poverty and unemployment) for several districts in West Sumatra in 2011-2021, so the data used are panel data). Data obtained from the Indonesian Central Statistics Agency (BPS).

The Model regression panel consists of Common Effect Model, Fixed Effect Model and Random Effect Model. To get the best model, model selection was carried out using the Chow Test, Hausman Test and lagrange multiplier test. The first step in choosing the best model is (1) conducting a Chow Test, which is a choice between the common effect model and the fixed effect model shown by the Chi square Cross-section Probability value greater than $\alpha = 0.05$ then the best model is the Common Effect Model and if the Chi-square Cross-section Probability value smaller than $\alpha = 0.05$ then the best chosen one is the Fixed Effect Model. The second step is to conduct the Hausman test, which is the selection between the fixed effect Model and the Random Effect Model, if the Probability Cross-section Random value is greater than $\alpha = 0.05$ then the Model is selected Random Effect Model, if the Probability Cross-section Random value is smaller than $\alpha = 0.05$ then the selected model Fixed Effect Model. The test step will stop if a Fixed Effect Model is selected from both tests. If not, the third step of the lagrange multiplier test is carried out. The lagrange multiplier test is between the Common Effect Model and the Random Effect Model, if Prob $\chi^2 > \alpha = 0.05$ then the Common Effect Model is selected and the Prob. χ^2 value $< \alpha = 0.05$ then the model is selected Random Effect Model.

The model used is linear regression with data processing through the help of the eviewss 10 Statistical Package. Regretion is a statistical analysis tool designed to measure the direction and magnitude of the influence of one or more variables on one or more dependent variables (Gujarati and Porter, 2009). The regression model specifications are expressed as follows:

$$HDI_t = \alpha + \beta_1 BF_{t-1} + \beta_2 PV_{t-1} + \beta_3 LOI_{t-1} + \beta_4 UEP_{t-1} + e_i$$

Information:

Human Development Index Year n	=	HDI _t
Last Year's Balance Fund	=	BF _{t-1}
Last Year's Poverty	=	PV _{t-1}
Last Year's Local original Income	=	LOI _{t-1}
Last Year's Unemployment	=	UEP _{t-1}
Constant	=	α
Variable Regression Coefficient	=	$\beta_1 \beta_2 \beta_3$
Standard error	=	e

The significance of the model is carried out by the calculation of the correlation coefficient (r), and the adjusted coefficient of determination (\bar{R}^2).

The hypothesis of this study:

- The variables of Balance Fund, Local original Income, Poverty and Unemployment have a significant effect on the Human Development Index of simultan.
- The variables of Balance Fund, Local original Income, Poverty and Unemployment have a significant effect on the Human Development Index of partially.

IV. RESULT

Statistical Descriptive Analysis of the data of this study is described in the following table 2:

Table 2. Descriptive Statistic

	LogHDI _t	LogBF _{t-1}	LogPV _{t-1}	LogLOI _{t-1}	LogUEP _{t-1}
Mean	1.822355	8.816922	0.940172	7.670021	0.666931
Median	1.826755	8.824622	0.910090	7.665058	0.673942
Maximum	1.860098	9.196651	1.312600	8.184111	1.067815
Minimum	1.744762	8.472109	0.668386	7.152491	0.096910
Std. Dev.	0.024257	0.159687	0.117356	0.257908	0.178075
Skewness	-1.235658	-0.101127	0.852141	0.007666	-0.348430
Kurtosis	4.676664	2.387357	3.995586	2.006210	3.642973
Jarque-Bera	49.05235	2.289312	21.42674	5.433199	4.944650
Probability	0.000000	0.318333	0.000022	0.066099	0.084388
Sum	240.5509	1163.834	124.1028	1012.443	88.03484
Sum Sq. Dev.	0.077078	3.340490	1.804183	8.713650	4.154124
Observations	132	132	132	132	132

Source: Processed Eviewss Version 10

Table 2 above shows the standard deviation values from last year's data for the Balance Fund, Poverty, Local original Income, Unemployment variables and the Human Development Index standard deviation values for the year t data. The comparison of the standard deviation and Mean values shows that the standard deviation value is smaller than the mean value, meaning that the data varies less. According to Andi Supangat (2007), the curve of all highly pointed variables determined by the value kurtosis is above 0.263. The data from the variables studied were all normal addressed by skewness values spanning -2 and 2 (Ghozali, 2016).

The Panel regression model in this study was processed with Eviewss Version 10 with the following description:

Table 3. Common Effect Model, Fixed Effect Model, Random Effect Model

Variable	Common Effect Model			Fixed Effect Model			Random Effect Model		
	Coeff	t-Static	Prob.	Coeff	t-Static	Prob.	Coeff	t-Static	Prob.
HDI	Dependent Variables								
C	1.6779	22.887	0.0215	1.3808	33.429	0.0061	1.40295	34.4659	0.0090
LogBF_{t-1}	0.0297	2.6678	0.0086	0.0357	7.8880	0.0274	0.03418	7.63919	0.0155
LogPV_{t-1}	-0.1483	-13.249	0.0169	-0.0324	-3.6552	0.0004	-0.0384	-4.4316	0.0012
LogLOI_{t-1}	0.00059	0.0796	0.0367	0.0207	8.8643	0.0423	0.02024	8.6729	0.0347
LogUEP_{t-1}	0.02663	4.3742	0.0376	-0.0019	-0.8029	0.0236	-0.0014	-0.5915	0.0052
R-squared	0.759371			0.885872			0.932475		
Adjusted R-squared	0.751792			0.884045			0.930348		
F-statistics	100.1959			539.6421			438.4436		
Prob(F-statistic)	0.000879			0.004672			0.000000		

Source : processed Eviews Version 10

Table 3 above illustrates three panel models treated with the eviewss version 10 program. The three models show that all variables have a significant effect on the Human Development Index and variations in the influence of independent variables on the Human Development Index above 50 percent. To get the best model from the 3 models above, Chow test, Hausman test and lagrange multiplier (LM) test must be done. The selection of the best model from the panel data above is carried out as follows:

Table 4. Chow Test, Hausman Test, Lagrange Multiplier Test

Information	Test	Test results
Chow Test	Common Effect Model VS Fixed Effect Model	Fixed Effect Model
Hausman Test	Fixed Effect Model VS Random Effect Model	Fixed Effect Model
Lagrange multiplier (LM) test	Common Effect Model VS Random Effect Model	Common Effect Model

Source : processed Eviews Version 10

Based on the chow test, Hausman test and lagrange multiplier test above the most test results are the Fixed Effect Model.

Selected models based on table 4, the next step is to perform a test of classical assumptions. This test is carried out to ensure that the regression equations that are functioned are precise and valid, namely the accuracy of estimates, unbiased, and consistent. The results of the classic test based on processing are as follows:

Table 5. Classic Asumsi Test

No.	Test Classical Assumptions	Result	Information
1	Normalization test	Probability $0.635737 > \alpha = 0.05$ (greater than 0.05)	Normalized distributed data
2	Multicollinearity Test	0.0162 to 0.0979 (no free variable has a value above 0.80)	There is no problem of multicollinearity.
3	Heteroskedasity Test	Prob. Chi-Square(4) = $0.0946 > \alpha = 0.05$	There is no problem of heteroskedasticity.
4	Autocorrelation Test	Prob. Chi-Square(2) = $0.1325 > \alpha = 0.05$.	No autocorrelation problems occur.

Source: processed Eviews Version 10

The results of table 5 above illustrate that the fixed effect model selected as the best model based on the calcic assumption testis the right and valid model shown by the results of the Normality test, Multicolonierity Test, Heteroskedasity Test and Autocorrelation test.

The hypotheses that have been built into the above methodology can be described partially and simultaneously.

Partially:

1. The Balance Fund variable (BF_{t-1}) affects the human development index (HDI_t) significantly and positively as illustrated by a probability value of $0.0274 < \alpha = 0.05$. This explains that the receipt of the Balance Fund of each Regency in West Sumatra from the center in the previous year can increase the Human Development Index.
2. The Poverty Variable (PV_{t-1}) affects the Human Development Index Variable (HDI_t) significantly and negatively illustrated by a probability value of $0.0004 < \alpha = 0.05$. The picture explains that the poverty of the previous year can reduce the value of the Human Development Index.
3. The Local Original Income Variable (LOI_{t-1}) can significantly and positively affect the human development index (HDI_t) as illustrated by a probability value of $0.0423 < \alpha = 0.05$. It states that last year's Local Original Income receipts could increase the Human development index for districts in West Sumatra Province.
4. The Unemployment Variable (UEP_{t-1}) affects the human development index (HDI_t) significantly and negatively as illustrated by a probability value of $0.0236 < \alpha = 0.05$. This explains that unemployment last year could decrease in the value of the Human Development Index in districts in West Sumatra Province.

Simultaneously:

Simultaneously, the Balance Fund Variable (BF_{t-1}), the Poverty Variable (PV_{t-1}), the Local Original Income Variable (LOI_{t-1}) and the Unemployment Variable (UEP_{t-1}) significant effect on the Human Development Index of Regencies in West Sumatra. Meanwhile, the magnitude of the variation in the influence of the Balance Fund Variable (BF_{t-1}), Poverty Variables (PV_{t-1}), Local Original Income Variables (LOI_{t-1}) and Unemployment Variables (UEP_{t-1}) on Human Development Index was 0.884045 or 88.41 percent and the remaining 11.59 percent was influenced by other variables not studied in this study.

Multiple Linear Regression Equation, from this study is:

$$HDI_t = 1.3808 + 0.0357 \text{Log} BF_{t-1} - 0.0324 \text{Log} PV_{t-1} + 0.0207 \text{Log} LOI_{t-1} - 0.0019 \text{Log} UEP_{t-1}$$

The regression equation above can explain:

1. The constant variable was 1.3808. If there is no change in the variable of the independent variable, the value of the Human Development Index (HDI) is 1.3808.
2. The Balancing Fund Variable (BF_{t-1}) has a regression coefficient value as big 0.0357. It states that the current Human Development Index increased by 0.0357 when assumed last year's Balance Fund rose by one unit and variable another fixed.
3. The Poverty Variable (PV_{t-1}) has its regression coefficient value as big -0.0324 , meaning that if variable poverty last year rises by one unit, then the Human Development Index variable will decrease by 0.0324 assuming variable others do not undergo changes.
4. The Local Original Income Variable (LOI_{t-1}) has a coefficient value of as biq of 0.0207, meaning that the Human Depeloment index increased by 0.0207 as a result of the assumed increase in Local Regional Income last year by one unit and variable another fixed.
5. The Unemployment Variable (UEP_{t-1}) has a regression coefficient as big -0.0019 , meaning that the Human Depeloment Index will decrease by 0.0019 if it is assumed that the value of unemployment (UEP_{t-1}) increases by one unit and variable another fixed.

From the equation above, it can be seen that the value of the regration coefficient of all the variables studied is smaller than one. This value shows that the influence of the variables Balance Fund (BF_{t-1}), Poverty (PV_{t-1}), Local Original Income (LOI_{t-1}) and Unemployment (UEP_{t-1}) inelastic. This means that the effect of the independent variable is small on the Human Development Index.

V. CONCLUSION

One important indicator of economic development is the Human Development Index. In this study, the Human Development Index (HDI_t) was influenced by the Balance Fund (BF_{t-1}), Poverty (PV_{t-1}), Local Original Income (LOI_{t-1}) and unemployment (UEP_{t-1}) and to see those influences built a multiple linear regression model. The results describe the Balance Fund (BF_{t-1}), Poverty (PV_{t-1}), Local Original Income (LOI_{t-1}) and

unemployment (UEP_{t-1}) significant effect on the Human Development Index both simultaneously and partially. The variables of the Balance Fund (BF_{t-1}), and Local Original Income (LOI_{t-1}) have a positive effect on the Human Development Index. While Poverty (PV_{t-1}) and unemployment (UEP_{t-1}) have a negative effect.

Human development is an important issue in sustainable development planning and strategy, it is hoped that this research will provide inputs in making policies against poverty and unemployment. The achievement of Human Development depends largely on the socioeconomic conditions of a region. The socioeconomic conditions of the area are highly dependent on the balance fund and the original income of the area itself. To be able to increase the Regional Balance and Revenue Fund is to improve regional financial administration so that there is no waste in regional financial management, increase cooperation with other regions and investors/entrepreneurs who can increase the economic resources of the area and strengthen institutional responsibility in all levels. In addition, the increase in regional indigenous income is followed by adjustments to regional expenditures to increase human resource development in the fields of education, health, and per capita income.

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