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Analysis of the Effect of GRDP, Education Expenditure, Participation, and School Building on HDI in 2015-2019 (Case Study in West Java Province)

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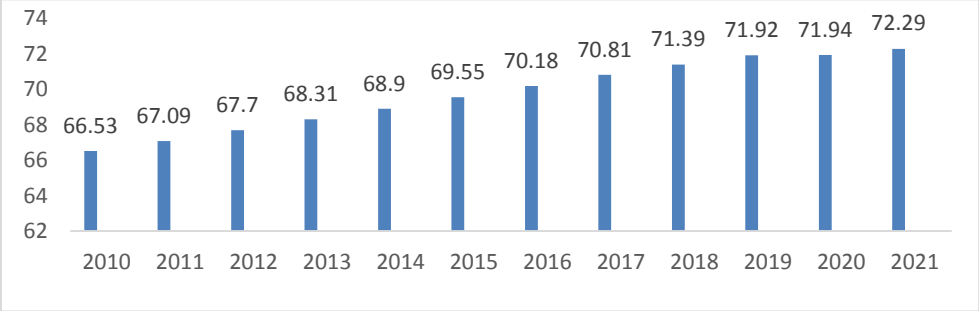
ABSTRACT: *This study aims to analyze the effect of the regional GDP (GRDP), education expenditure, the number of school participants between the 16-18 age groups, and the school building toward the Human Development Index in West Java Province in 2015-2019. The analytical method used in this research is a quantitative analysis and regression analysis method that used panel data, a combination of cross-section and time series data. The test used in this study is the fixed effect model. Based on the outputs of the analysis, it can be known that the Gross Regional Domestic Product (GRDP) and education expenditure have a positive and significant effect, the number of school participants aged 16-18 have a positive but not significant effect, while school buildings have a negative but not significant impact on the Human Development Index (HDI).*

KEYWORDS - *Human Development Index, Education Expenditure, GDRP, School Participants, School Building*

I. INTRODUCTION

The human index is a mirror that can measure the quality of human life in a country or region, HDI is used as an indicator to assess the quality aspects of development and to classify whether a country is a developed country, a developing country, or an underdeveloped country and also to measure the influence of policies economics on quality of life (BPS, 2015). Measuring tools for success in efforts to build the quality of human life are classified into four categories of Human Development Index (IPM), including low human development HDI<60, medium human development 60≤IPM<70, high human development 70≤IPM<80, and very high human development HDI≥80 (BPS, 2015).

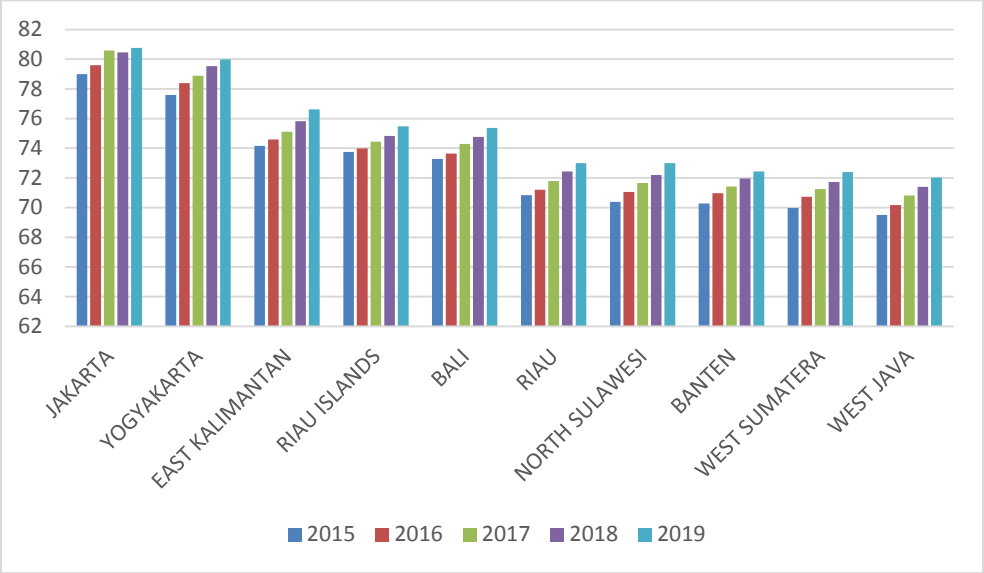
Figure 1. Indonesia Human Development Index



Source: BPS, 2010-2021

Based on Figure 1, Indonesia has experienced an increase in HDI every year from 2010 (66.53) to 2021 (72.29). This development means that in 2010 Indonesia was in the category of medium human development, now it is in the category of high human development. The highest increase occurred in 2014-2015 with an increase of 0.65. Meanwhile, the transition from the category of medium human development to high human development occurred in 2016.

Figure 2. Highest HDI in 10 West Java Provinces 2015-2019 (Percent)



Source: BPS, 2010-2021

The ten provinces with the highest HDI in Indonesia are shown in Figure 2 There is an increase in HDI from year to year from 2015 to 2019. The area with the highest HDI in Indonesia is located in DKI Jakarta since 2015. Of the 10 provinces with the highest HDI in Indonesia, Province West Java only ranks last throughout the period 2015 to 2019.

West Java Province, Indonesia's largest population reaching 48 million people (Sensus, 2020), only ranks 10th with an average HDI of 71. With the largest provincial population in Indonesia, the HDI of West Java Province significantly influences the increase in Indonesia's HDI. Therefore, this study was conducted to analyze the influence of factors related to HDI in the economic and education sectors in West Java Province.

Related research that explains the influence of GDP on HDI was carried out by (Munawwaro, 2013) saying that the increase in GDP shows the economic excitement of a country because the economy in that country has moved and expanded so that in the end it can improve the welfare of the country. An increase in GDP will increase people's welfare through an increase in the income they receive. When the level of income or GDP per capita increases because of the increase of GDP, it causes public spending to increase human development to increase.

Research in the education sector that explains the relationship between education spending on HDI was also carried out by (Palayukan, 2019) who estimated the relationship between government spending on education and the human development index, the results obtained were that government spending on education had a positive relationship to the human development index. Based on this research, it can be interpreted that when the government increases spending on education, it has an effect on increasing the human development index. Meanwhile (Desmaniar, 2020) explains the concept of APS as being assessed as an indicator of educational success. The concept links regional autonomy policies in the education sector as one of the main tasks and functions that must be the focus of the government. That way, the increase in APS will affect the HDI. Another related research conducted (Rosyid and Lukito, 2018) examining the relationship between infrastructure and the human development index in Banten Province explains that the relationship between infrastructure and the human development index is positive and significant.

The urgency of this study is to analyze and identify variables related to HDI in West Java Province in 2015-2019 based on GRDP, education spending, school participation, and school buildings in order to increase the HDI of West Java Province which is the purpose of this research. in the form of policies or input for the relevant government.

II. CRITICAL THEORISTS

UNDP (United Nations Development Programme) defines human development as a process of expanding choices for people. In this concept, the population is placed as the ultimate goal while development efforts are seen as a means to achieve that goal. To ensure the achievement of human development goals, four main things that need to be considered are productivity, equity, sustainability, and empowerment (UNDP, 1995).

According to Mardiasmo (2002), the public sector budget is an activity plan that is presented in the form of an income and spending plan in monetary units. Not only as a financial planning tool, according to Mardiasmo (2009) the budget functions as a means of controlling fiscal policy, coordination and communication, political tools, performance appraisal, and motivation.

Government spending on education is a fundamental government expenditure in development. Education is a main factor in achieving human capabilities, which are also essential for people's lives. Education is an investment that will always have an impact on the future. Education is the basic capital in economic growth and nation-building. The government must provide spending allocations in the education sector which will be used to build educational facilities and infrastructure as well as invest in forming human capital. Human capital is a productive investment in people; includes knowledge, skills, abilities, and ideas (Todaro & Smith, 2011)

Todaro (2000) in his theory concludes, there will be a gap between social and individual costs, which will spur higher levels of demand for education. However, on the other hand, the creation of opportunities to obtain higher education resulted in a surge in social costs in the form of worsening resource allocations which ultimately resulted in a decrease in the supply of funds and direct employment opportunities to carry out other development programs. In the end, higher education is no longer a tool, but an end in itself

Rostow (1959) introduced a model that linked the development of government spending to the stages of economic development which were divided between early, intermediate, and advanced stages. In the early stages of economic development, the percentage of government investment to total investment is large because the government must provide facilities and services such as education, health, and transportation. Then at the intermediate stage of economic development, government investment is still needed to increase economic growth so that it can increase, but at this stage, the role of private investment is also getting bigger.

III. RESEARCH METHODS

This research uses secondary data types, namely data from books, literature, and other sources that can be used to support this research. The data used in this study is panel data which is a combination of cross-section and time series data. The data used in this study were from all districts/cities in West Java Province in 2015-2019.

The independent variables used in this study were GRDP, education spending, school participation in the 16-18 age group, and school buildings. While the dependent variable used in this study is HDI. The regression model estimation method using panel data can be done in 3 approaches, namely as follows; 1) Common Effect Model (CEM), 2) Fixed Effect Model (FEM), 3) Random Effect Model (REM), (Gujarati, 2015). The selection of the best model is based on the Chow Test and Hausman.

The Chow test is used to determine whether the Fixed Effect Model regression technique is better than the Common Effect Model regression technique. If the X^2 (Chi-square) statistic < (0.05), then using the Fixed Effect Model is better.

Table 1: Chow Test

Effect Test	*Statistic*	*d.f*	*Prob.*
Cross-Section F	*66.160072*	*(13.80)*	*0.000*

Source: secondary data, processed

Based on the results of the Chow test, it was found that Prob. for Chi-square and F-test of 0.000 which means smaller than the significant value of 0.05. Thus, it can be concluded that the selected model is the Fixed Effect Model.

The Hausman test is used to determine whether the Random Effect Model regression technique is better than the Fixed Effect Model regression technique. If the probability value of $X^2 > (0.05)$, then using the Random Effect Model is better.

Table 2: Hausman Test

Test Summary	*Chi-sq Statistic*	*Chi-sq d.f*	*Prob.*
Cross-Section F	*56.562429*	*6*	*0.000*

Source: secondary data, processed

Based on the results of the Hausman test, it was found that Prob. for the Chi-square of 0.000 means it is smaller than the significant value of 0.05. Thus, it can be concluded that the selected model is the Fixed Effect Model.

IV. RESULTS AND ANALYSIS

STATISTIC TEST

Statistical tests in the model include several tests, namely the coefficient of determination test (R^2), simultaneous significance test (F test), and individual parameter significance test (t-test).

The coefficient of determination essentially measures how far the model's ability to explain the variation in the dependent variable. If the value of R^2 shows a small result, it can be concluded that the ability of the independent variable to explain the dependent variable is limited. Conversely, if the value of R^2 shows a large result, it can be concluded that the ability of the independent variable can provide the information needed to explain the dependent variable.

Table 3: Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	106.2457	20.71702	5.128423	0.0000
X_1	2.45E-07	3.54E-08	6.914199	0.0000
X_2	0.000968	0.000230	4.201610	0.0001
X_3	0.027244	0.016935	1.608745	0.1108
X_4	-1.46E-05	0.000244	-0.059920	0.9523

R-squared	0.983584	Mean dependent var	70.30348
Adjstd R-squared	0.978434	S.D. dependent var	4.950667
S.E. of regression	0.727031	Akaike info criterion	2.408892
Sum squared resid	53.91457	Schwarz criterion	3.119070
Log likelihood	-129.6002	Hannan-Quinn criter.	2.697488
F-statistic	190.9799	Durbin-Watson stat	1.697039
Prob(F-statistic)	0.000000		

Source: secondary data, processed

The results of the R-squared of 0.983584 means that 98.35% of the HDI variable can be explained by the variables of GRDP, education spending, APS, and school buildings. While the adjusted R-squared value is 0.978434, which means that 97.84% of the dependent variable can be explained by the independent variable.

The F-test is used to determine how far the ability of all independent variables contained in the model as a whole is in explaining the dependent variable. This test uses a significance level of 5% (0.05). If the value of $F_{count} > F_{table}$ then H_0 is rejected and H_1 is accepted. This means that the independent variables as a whole have a significant effect on the dependent variable.

The result of the F_{count} value is 190.9799. The Degree of Freedom for the numerator is 4 (k-1 = 5-1) and the Degree of Freedom for the denominator is 130 (n-k = 130). Then it can be seen that the Degree of Freedom value from F_{table} is 2.44. The value of F_{count} is greater than F_{table}, then this shows that the variables of GRDP, education spending, APS, and school buildings have an effect on HDI.

The T-test is used to determine how far the influence of individual variables on the dependent variable. In this test, H1 will be accepted if it shows a positive direction and the significance value is below 5% (0.05) or when t_{count} is greater than t_{table}. The value of Degree of Freedom is 130 (n-k = 135-5 = 130), then the t_{table} value is 1.98. Table 3 shows the results of the fixed effect regression model that has been obtained.

DISCUSSION

This study aims to analyze the effect of GRDP, education spending, school participants, and school buildings on HDI in West Java Province in 2015-2019. Based on data processing using regression, it produces the following equation:

$$HDI_{it} = 106{,}2457 + 2{,}4499 GDRP\ (X_1)_{it} + 0{,}000968 Expenditure\ (X_2)_{it} + 0{,}027244 Participation\ (X_3)_{it} - 1{,}4625 Building\ (X_4)_{it} + \mu_{it}$$

The first hypothesis tested in this study is the effect of GRDP on HDI. Based on the test results, it can be seen that the coefficient value of GRDP is 2.4499 and is significant at α (0.05). These results are in accordance with the initial hypothesis which states that the GRDP variable has a positive and significant effect on HDI. The results of this study are in line with research conducted by Rakhmadhani (2018) which explains that there is a positive and significant influence between GRDP and HDI in the districts/cities of East Java Province. Other research that is in line with these results was also carried out by Ariwuni and Kartika (2019) who concluded that there was a positive relationship between GRDP and HDI in the districts/cities of Bali Province.

The results of this study are also in line with the theory put forward by Kuznet where high per capita output growth is a characteristic of modern economic growth (Todaro, 2006). It was further explained that increased GRDP growth will affect the increase in people's per capita income which affects household patterns and spending allocations which have an impact on increasing the human development index.

The next hypothesis tested is the effect of education spending on HDI. Based on the test results, it can be seen that the coefficient value of the education expenditure variable is 0.000968 and is significant at α (0.05). These results are also consistent with the initial hypothesis which states that the education expenditure variable has a positive and significant effect on HDI. The results of this study are in line with previous research conducted by Novitasari (2015) which concluded that education spending has a positive and significant effect on HDI in 38 cities/districts in East Java. Another study conducted by Harjunadhi and Rahmawati (2020) which explains the relationship between the education budget and HDI in 34 Indonesian provinces explains that the education budget has a positive correlation or relationship to HDI.

These results are in line with the theory put forward by Rostow (1959) which explains the government's obligation to provide educational facilities at the initial stage and then at the intermediate stage of economic development. This theory is in line with the West Java Government's consistency in allocating the APBD budget at least 20% for education.

The third hypothesis tested is the effect of APS on HDI. Based on the test results, it can be seen that the value of the coefficient is 0.027244 and is not significant at α (0.05). These results are not in accordance with the initial hypothesis which states that the APS variable has a positive and significant effect on HDI. However, the results of this study are supported by Elfarabi (2018) who concluded that the APS variable is not influenced by government funds. These findings are further due to the low number of higher education graduates so this becomes a burden for the regions which causes a decrease in the quality of education. The conclusion is that the effect of APS on HDI in West Java Province is not significant because the school enrollment rate in the 16-18-year-old category is still low.

These results are also supported by the Human Capital Theory put forward by Todaro and Smith (2011) explaining that education plays a vital role in the growth and development of a country. The role of education in developing countries is to shape a country's ability to absorb modern technology and develop the capacity to create sustainable growth and development.

The final hypothesis tested in this study is school building on HDI. Based on the test results, it can be seen that the value of the school building coefficient is -1.4625 and is not significant at α (0.05). These results are not in accordance with the initial hypothesis which states that the school building variable has a positive and significant effect on HDI. However, the results of this study are in line with Rubiyatno (2012) which shows that educational facilities do not show a relationship with human development. Even though the increasing number of schools should have an effect on the opportunity to obtain education which can improve the quality of life and welfare. The reason is that the number of facilities is not able to fully describe the output of education itself. Because the quality of education that influences the increase in HDI is not only influenced by school buildings. The number of school buildings that are not feasible also has an influence, as well as the quality of students. Based on this research, it is explained that school buildings are not able to improve the quality of HDI.

V. CONCLUSION

Based on the research that has been done, several conclusions were obtained including:

1. The GRDP variable has a positive and significant effect on the HDI of West Java Province. The significance of the GRDP variable on HDI in West Java Province is that the increase in GRDP has an effect on increasing people's per capita income which affects household patterns and spending allocations which have an impact on increasing the human development index.

2. The education spending variable has a positive and significant effect on HDI. The significance of the education spending variable on HDI in West Java Province is due to the mandatory spending of 20% in the education sector which is in accordance with the theory where the government is required to provide educational facilities.

3. The APS variable has a positive but not significant effect on HDI. These results are because the APS level in the 16-18 age category in West Java Province is still relatively low so that the impact is not significant on increasing the HDI.
4. The school building variable has a negative but not significant effect on HDI. These results are because school buildings alone cannot represent the output of education itself.

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