ANALYSIS OF THE EFFECT OF EDUCATION, HEALTH EXPENDITURES AND PER CAPITA INCOME TO HUMAN DEVELOPMENT INDEX IN CENTRAL SULAWESI PROVINCE FOR THE PERIOD 2015-2019

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ABSTRACT

KEYWORDS Education; human development; population	The Human Development Index (HDI) is part of the development goals, high HDI is not easy to achieve, it takes the seriousness of the government to allocate budgets in the education sector and health expenditures. Per capita income is also part of increasing HDI. Central Sulawesi's HDI continues to increase from 2015-2019, the distribution of the education, health, and per capita income sectors also continues to increase. The purpose of this study was to determine the effect of expenditure in the education, health, and per capita income sectors on HDI in Central Sulawesi. The analysis tool used with panel data regression, the results of the study showed: Education sector expenditure had a negative but insignificant effect on the HDI of Central Sulawesi for the 2015-2019 period, while health sector expenditure had a positive and significant effect on HDI and per capita income had a negative and insignificant effect on the HDI of Central Sulawesi for the 2015-2019 period

INTRODUCTION

Development is an effort to improve the welfare of a nation, a decent standard of living of the population and a good quality of human resources (Mulyasari, 2016). Development becomes part of a process of continuous state change to achieve national goals. The national goal is to promote just and prosperous welfare for all Indonesians (Ahmadi, 2016).

(Sen, 1999) suggests that the human development approach is a human capabilities approach. The concept of human capabilities approach is to find out the ability that a person has to do something that is of value to use. Human ability is not seen how much income they have, but how much the ability to achieve something of use value (Sunaryo et al., 2016). Everyone has different abilities, to achieve goals, the efforts made are also different. Education and health are very important to advance human development in a country, each region is competing to improve education and health to support the development of a region. Health and education are the most fundamental forms of advancing human development in an area. Education is a basis for human beings to support development, (Stiglitz & Meier, 2000).

Development goes well if it is supported by quality education and human resources. The deterrent of regional/regional development is a human being who is able to make a positive contribution to the regional economy (Prawoto & Basuki, 2016). Based on Permendagri No. 38 of 2018 concerning Guidelines for the Preparation of the 2019 APBD, the minimum health budget allocated for health is 10 percent of the APBD, while the education budget is 20 percent of the National Budget (APBN). Data published by the Directorate General of Financial Balance in 2019, shows the realization of the APBD for

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government expenditure in the education and health sector in Central Sulawesi Province in 2015-2019 (Damodar, 2013).

Based on data from the Directorate General of Financial Balance, in 2015 the realization of the government expenditure budget for the education sector amounted to Rp656,214,533,067 and in 2016 it decreased to Rp190,455,713,140 (growth -70.98 percent). The decrease in the education budget due to theuse of the budget of the education function is a need for the district to be included in the regional transfer budget. In 2017, it increased to Rp1,286,840,398,332 or a growth of 575.66 percent. In 2018 the budget decreased to Rp1,243,942,609,942 (-3.33 percent). In 2019 the budget increased to Rp1,392,631,315,361 (11.95 percent). Directorate General of Financial Balance, 2019 (Andiny & Sari, 2018).

The government expenditure budget for the health sector in 2015 amounted to Rp331,630,944,407 or an increase of 24.83 percent and in 2016 the expenditure amounted to Rp329,191,290,859 or decreased compared to the previous year (-0.74 percent) (Handayani, 2015). In 2017 the budget growth was Rp381,951,315,196 or an increase of 16.03 percent. In 2018 it was Rp424,150,984,865 or an increase of 11.05 percent. In 2019, the health sector budget was IDR 503,775,510,742 or an increase of 18.77 percent. The per capita income of Central Sulawesi regencies/cities showed an increase, per capita income in 2015 amounted to Rp6,422,312 increased to Rp7,614,595 in 2017 until 2019 per capita income continued to increase (Wulan & Chotimah, 2017).

The HDI of Central Sulawesi has increased from 66.76 in 2015 to 69.50 in 2019 (HDI per Central Sulawesi regency by district, namely Morowali Regency 72.02, Poso Regency 71.40, North Morowali Regency 68.45, Banggai Regency 70.36, Buol Regency 67.59, Sigi Regency 68.16, Donggala Regency 65.49, Parigi Moutong Regency 65.47, Toli-Toli Regency 62.42, Banggai Islands Regency 65.13, Banggai Laut Regency 65.27, and finally Tojo Una-una Regency 64.52 (BPS Central Sulawesi Province, 2019) (Kahang, 2016).

Per capita income has a positive relationship with HDI, as well as budget allocations in the education and health sectors. Increasing the government's budget allocation in the education and health sectors will increase the productivity of the population further (Meylina, Nikensari, & Kuncara, 2013).

The Central Sulawesi government pays attention to the increase in HDI in Central Sulawesi, the government's budget expenditure allocated to the education and health sectors continues to increase from 2015-2019. Central Sulawesi's economic activities have driven an increase in per capita income from year to year. The increase in education, health and per capita income will increase the HDI in Central Sulawesi (Ichwan, Anam, Sir, Mertosono, & Yunus, 2021).

Education expenditure is expected to increase the Average Length of Schooling (RLS) and increase Life Expectancy (UHH) in Central Sulawesi, as well as health and per capita income which increases play a role in increasing HDI. Then research is needed to find out:

1. How does the education sector expenditure affect the HDI of the regencies/cities of Central Sulawesi Province for the 2015-2019 period?
2. How does the health sector expenditure affect the HDI of the regencies/cities of Central Sulawesi Province for the 2015-2019 period?
3. How does per capita income affect the HDI of regencies/cities of Central Sulawesi Province for the 2015-2019 period?

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RESEARCH METHOD

The type of research used is quantitative research with an explanatory type of research which aims to find an explanation of why an event or symptom occurs. The end result of this study is an overview of the causal relationship.

This study was conducted in Central Sulawesi Province, using the observation year period 2015-2019.

The object of this study is government expenditure in the education sector and the Health sector, as well as per capita income as a free variable and the Human Development Index as a bound variable.

The data used in this study is quantitative data. Quantitative data is data in the form of numbers or numbers. According to its form, quantitative data can be processed or analyzed using calculation or statistical techniques. (Hammack & Anheier, 2013).

RESULT AND DISCUSSION

Based on BPS that the HDI of Central Sulawesi for the 2015-2019 period showed an increase, the HDI increased a sign of positive things. In 2015 the HDI was 66.76 and experienced a continuous increase until 2018-2019 to 68.88 and 69.5. In 2019, it was recorded that four regencies/cities had HDI above the HDI of Central Sulawesi, namely Banggai Regency, Morowali Regency, Poso Regency and Palu City. Palu City with the highest HDI compared to other districts is 69.50. Many economic activities are carried out in Palu City as the provincial capital, RRLS (Average School Duration) and HLS (Harapan Lama sekolah) Palu City are the highest in Central Sulawesi.

Development of Government Expenditure in the Education Sector by Region in Central Sulawesi Province, government expenditure a budget that has been given by the central government to local governments to realize even better human development. Government spending is also a tangible manifestation of the success of local governments in realizing human development in their regions, this success is seen in the form of realization. The larger the budget given by the government, the positive impact on improving the quality of human development.

In 2015 the expenditure of the Central Sulawesi education sector amounted to Rp656,214,533,067 and experienced a continuous increase, in 2017 the expenditure amounted to Rp1,286,840,398,322 and in 2019 amounted to Rp1,392,631,315,361. It was recorded that six districts/cities had their education budgets in a fluctuary, namely Buol Regency, Banggai Regency, Palu City, Tojo Una-una Regency, Sigi Regency, and Morowali Regency.

Table 1
Development of Government Expenditure in the Education Sector by Region in Central Sulawesi Province Period 2015-2019 (billion rupiah)

No	Districts/Cities	2015	2016	2017	2018	2019
1	Banggai	417	466	494	467	459
2	Banggai Islands	167	157	171	195	202
3	Buol	231	34	228	225	239
4	Far-Far Away	215	221	246	248	262
5	Donggala	302	324	322	326	357
6	Morowali	207	24	195	218	245

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7	Poso	343	45	327	329	361
8	Palu City	457	460	372	357	365
9	Paringi Moutong	356	339	401	433	466
10	Tojo One-One	234	220	226	234	272
11	Sigi	280	45	316	310	306
12	Banggai Laut	69	81	88	110	113
13	North Morowali	135	186	190	181	214
	Central Sulawesi	**656**	**190**	**1.286**	**1.243**	**1.392**

Source: DPJK Central Sulawesi 2015-2019

Table 2 shows the percentage of government expenditure in the education sector, in 2019 Morowali, Tojo Una-una, and North Morowali districts were the districts with higher growth in education sector expenditures than provincial education sector expenditures. The percentage growth of Morowali Regency is 12.4 percent, Tojo Una-una Regency is 16.2 percent and North Morowali Regency is 18.2 percent, while Central Sulawesi's growth of 12 percent, education sector expenditure will improve the quality of education of a district/city. However, there are also districts with a percentage of growth that has not increased (minus), namely Banggai Regency (-1.7 percent), and Sigi Regency (-1.3 percent).

Table 2
Growth of Government Spending in the Education Sector
By Region in Central Sulawesi Province
Period 20l5-20l9

No	Districts/Cities	2016	2017	2018	2019
1	Banggai	11,8	6,0	-5,5	-1,7
2	Banggai Islands	-6,0	8,9	14,0	3,6
3	Buol	-85,3	570,6	-1,3	6,2
4	Far-Far Away	2,8	11,3	0,8	5,6
5	Donggala	7,3	-0,6	1,2	9,5
6	Morowali	-88,4	712,5	11,8	12,4
7	Poso	-86,9	626,7	0,6	9,7
8	Palu City	0,7	-19,1	-4,0	2,2
9	Paringi Moutong	-4,8	18,3	8,0	7,6
10	Tojo One-One	-6,0	2,7	3,5	16,2
11	Sigi	-83,9	602,2	-1,9	-1,3
12	Banggai Laut	17,4	8,6	25,0	2,7
13	North Morowali	37,8	2,2	-4,7	18,2
	Central Sulawesi	**-71,0**	**576,8**	**-3,3**	**12,0**

Data processed

Based on Table 3 shows government spending in the health sector. In 2015-2019, the amount of central Sulawesi government spending continued to increase. The government seeks to improve the health of the people of Central Sulawesi by increasing

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spending on the health sector. Improving public health will reduce infant mortality, and increase life expectancy.

Table 3
Development of Government Expenditure in the Health Sector by Region In Central Sulawesi Province for the period 2015-2019 (billion rupiah)

No	Districts/Cities	2015	2016	2017	2018	2019
1	Banggai	192	225	296	293	399
2	Banggai Islands	64	67	93	105	152
3	Buol	104	41	134	188	178
4	Far-Far Away	150	139	255	195	279
5	Donggala	119	136	114	126	214
6	Morowali	113	21	163	189	248
7	Poso	146	-	163	208	235
8	Palu City	244	309	277	256	273
9	Paringi Moutong	178	260	262	257	358
10	Tojo One-One	140	150	178	172	231
11	Sigi	125	65	173	156	184
12	Banggai Laut	57	71	62	82	94
13	North Morowali	110	108	127	177	201
	Central Sulawesi	**313**	**329**	**381**	**424**	**503**

Source: DPJK Central Sulawesi 2015-2019

The Health Budget will create a better health service and it will reduce infant mortality and extend a person's life expectancy. Improving public health has a positive impact on the economy because people will work more productively. Based on data from the Central Sulawesi Regional Budget, health sector spending continues to increase in the 2015-2019 period In 2015 the distribution of the health sector amounted to Rp331,630,944,407 increased to Rp381,951,315,196 in 2017 to 2019 to Rp503,775,510,742. The highest health sector expenditures are Banggai Regency, Parigi Maoutong Regency, Toli-toli Regency, Morowali Regency, and Palu City.

Table 4
Health Sector Government Spending Growth
By Region in Central Sulawesi Province for the period 2015-2019 (%)

No	Districts/Cities	2016	2017	2018	2019
1	Banggai	17,2	31,6	-1,0	36,2
2	Banggai Islands	4,7	38,8	12,9	44,8
3	Buol	-60,6	226,8	40,3	-5,3
4	Far-Far Away	-7,3	83,5	-23,5	43,1
5	Donggala	14,3	-16,2	10,5	69,8
6	Morowali	-81,4	676,2	16,0	31,2
7	Poso			27,6	13,0
8	Palu City	26,6	-10,4	-7,6	6,6
9	Paringi Moutong	46,1	0,8	-1,9	39,3
10	Tojo One-One	7,1	18,7	-3,4	34,3

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11	Sigi	-48,0	166,2	-9,8	17,9
12	Banggai Laut	24,6	-12,7	32,3	14,6
13	North Morowali	-1,8	17,6	39,4	13,6
	Central Sulawesi	**5,1**	**15,8**	**11,3**	**18,6**

Table 4 shows that 2019 district/city expenditure experienced growth compared to 2018, there were 9 positive health expenditure growth districts, namely Banggai Regency, Banggai Islands Regency, Toli-toli Regency, Donggala Regency, Morowali Regency, Parigi Moutong Regency, Tojo Una-una Regency, and Sigi Regency. This shows the seriousness of the district/city government in improving public health. The government realizes that health is part of improving people's lives in the future.

Model Test

The selection of the best model begins with several approaches. There are three paneled data analysis approaches, namely the Common Effect Model, the Fixed Effect Model, and the *Random Effect Model*. After processing the data, obtain the following results:

1. *Common Effect Model (CEM)*

Table 5
Common Effect Model Estimation Results

Variable	*Coefficient*	*Prob.*
C	2.915309	0.0000
Education	-0.026283	0.2344
Health	0.074564	0.0061
Percapita	0.003971	0.2696
R-squared	0.176333	
Adjusted R-squared	0.135825	
S.E. of regression	0.060420	
Sum squared resid	0.222689	
Log likelihood	92.25097	
F-statistic	4.353031	
Prob(F-statistic)	0.007633	

Data processed

The results of the *common effect model* estimate show that partially the education sector expenditure variable has a negative (-0.02683) and insignificant (prob 0.2344) influence. Health and per capita have a positive effect on HDI, health has a positive effect but not significance, while per capita income has a positive but not significant effect. The Adjusted R-squared number of 0.14 or 14 percent of independent variables can explain the dependent variables.

2. *Fixed Effect Model (FEM)* Approach

The results of the *Fixed Effect Model* estimate show that partially the educational variable has a negative and insignificant relationship (prob 0.1471) to the HDI. The health variable is positively and significantly related to the HDI, the coefficient value is 0.023139 while the prob is 0.0005. The per capita income variable is negatively and significantly related to the HDI, the *coefficient* value -0.002732 and the prob 0.0004. The

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coefficient number shows 98 percent of independent variables can explain the dependent variable. Or the ability of the education, health, and per capita income variables to explain the HDI of 98 percent and the remaining or residual 2 percent is explained by other variables that are not included looking at the effect on HDI.

Table 6
Fixed Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.822105	0.107931	35.41245	0.0000
Education	-0.006580	0.004466	-1.473206	0.1471
Health	0.023139	0.006198	3.733470	0.0005
Percapita	-0.002732	0.000712	-3.834716	0.0004
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.980927			
Adjusted R-squared	0.975089			
S.E. of regression	0.010258			
Sum squared resid	0.005157			
Log likelihood	214.6300			
F-statistic	168.0082			
Prob(F-statistic)	0.000000			

3. ***Random Effect Model (REM) Test***

The estimation results convince the *Random Effect Model* that education has a negative and significant influence on HDI. Health variables have a positive and significant effect on HDI. Table 7 of the *Adjusted R – squared* coefficient of 0.501820 shows the ability of the education, health, and per capita income variables to explain the HDI of 51 percent and the remaining or residual 49 is explained by other variables that were not included and studied looking at their effect on HDI.

Table 9
Random Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.805472			0.0000
Education	-0.006799			0.1326
Kesehatan	0.023958			0.0003
Percapita	-0.002643			0.0004
Effects Specification				
			S.D.	Rho
Cross-section random			0.057953	0.9696
Idiosyncratic random			0.010258	0.0304
Weighted Statistics				
R-squared	0.525172			
Adjusted R-squared	0.501820			
S.E. of regression	0.010466			
F-statistic	22.48923			
Prob(F-statistic)	0.000000			

Data processed

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The next step is to perform a Model Test, a model test is carried out before analyzing the influence of independent variables on the dependent variables. Test models are also used looking at the best models used in multiple regression. There are three model tests carried out, namely *Chou Test, Hausman Test, Lagrage Multiplier Test* (LM).

1. *Chow* Test

The Chow test is used to determine the best model between CEM and FEM. If H0 CEM is the best model. The results of the *Chow* Test are as follows:

Table 10

***Chow* Test Results**

Effects Test	Statistic	D.F.	Prob.
Cross-section F	172.258378	(12,49)	0.0000
Cross-section Chi-square	244.758151	12	0.0000

Data processed

The probability value of F of 0.000 is less than the value of α (smaller than alpha 5 percent), H0 is rejected then the best model is FEM.

2. Uji *Hausman*

Test the *thirst* to see the best model between FEM and REM. The hypothesis of this test is H0 then the best model is REM. Hausman test results are as follows:

Table 11

***Hausman* Test Results**

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.495045	3	0.1389

Data processed

The best models between FEM and REM are shown from their probability values, if the value is less than the alpha of 5 percent then the FEM of the best model. Table 11 shows a probability value of 0.1389 greater than 0.05. So that H0 is accepted, the best model REM compared to FEM.

3. *Lagrange Multiplier* (LM) Test

LM tests were performed to find the best model between CEM -REM. This test was carried out because in the previous test it chose two different models. H0 = CEM and H1 = FEM

Table 12

***Lagrange Multiplier* Test Results**

Null (no rand. effect)	Cross-section	Period	Both
Alternative	One-sided	One-sided	
Breusch-Pagan	106.8028	1.723428	108.5262
	(0.0000)	(0.1893)	(0.0000)
Honda	10.33454	-1.312794	6.379340
	(0.0000)	(0.9054)	(0.0000)

Data processed

The LM test results refer to a statistical LM value greater than the *Chi-Square* statistical critical value then H_0 is rejected. If the statistical LM value is smaller than the

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statistical value. The *Breusch-Pagan* probability value of 0.0000 is less than the α of 0.05. LM value < critical value, REM models are better than FEM.

Based on the results of regression analysis, the data panel shows REM as the best model. Thenthe equation is as follows:

HDI = 3.805472 – 0.006799education + 0.023958health –0.002643perkapita+μit

The equation above shows that if education, health and per capita income are considered constant, the HDI will increase by 3.805472 percent. The relationship between independent variables to dependent variables is illustrated from the equation, the education variable will reduce the HDI by 0.006799 percent assuming the other variables are considered constant. While the health variable gives a positive relationship to the HDI assuming other variables do not change, if the health variable increases by 1 percent then the HDI increases by 0.023958 percent. For the per capita income variable has a negative relationship to HDI, When per capita income increases by 1 percent, the HDI decreases by 0.002643 percent.

Hypothesis Test

Simultaneous Hypothesis Test (f-statistical test)

This test is used to determine whether free variables have a significant influence on bound or synchronous variables. The test results were shown by

Table 13
f-Statistical Test Results

F-statistic	2.248.923
Prob(F-statistic)	0.000000

Data processed

The results of the F test analysis that the variables of education, health, per capita income simultaneously have a significant effect on the HDI variable (probability < 5 percent) which is 0.0000.

t-Statistical test

Table
t-Statistical Test Results

Variable	*Coefficient*	*Standard Error*	*t - Statistics*	*Probability*
C	3.805.472	0.108504	3.507.212	0.0000
Education	-0.006799	0.004460	-1.524.501	0.1326
Health	0.023958	0.006175	3.879.828	0.0003
Percapita	-0.002643	0.000711	-3.719.380	0.0004

Data processed

Statistical t–test to determine the effect of each independent variable on the dependent variable. The education variable has a negative but not significant effect (prob 0.1326), while the health variable has a positive and significant effect on HDI, the per capita income variable has a negative and significant effect on HDI.

Discussion

Effect of Education, Health, Per capita income on HDI

The Effect of Education on HDI

Education plays a big role in the development of social economic life by increasing knowledge, skills, productivity, so that education is able to produce a quality

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workforce. HDI measures a country's socio-economic development achievement, linking between attainments in education, health, and per capita real income, Todaro, 2009.

The achievement of good human quality is the goal of development, development requires qualified human resources for the implementation of the economy so that development goals are achieved. Government spending in the education, health, per capita income sectors can have a positive impact on increasing HDI in Central Sulawesi. This research shows that education negatively affects HDI in Central Sulawesi, investment in the education sector is a long-term investment, the human resources of the population will be seen in the future, for example the next 5 years or more. This research is in accordance with research conducted by (Koelmans et al., 2019).

Spending in the education sector increases the Old School Hope (HLS) in Central Sulawesi Province from year to year. Based on BPS, the Central Sulawesi HLS in 2015-2019 continues to increase, but HLS growth is declining. In 2016 HLS grew by 1.57 years, in 2017 it was 0.69 years and in 2019 it was 0.07 years.

When viewed from the length of time of education there is an increase, for example in 2015 by 12.72 it increased to 13.04 in 2017 and in 2019 by 13.14. Palu City has an HLS of 16.22, the highest HLS among other districts in Central Sulawesi. This is because the budget that is utilized in the higher education sector, Palu City provides good educational facilities and quality human resources.

Average School Length (RRLS) by district/city in Central Sulawesi showed an increase from 2015 – 2019. In 2015 the RRLS of 2.97 years increased to 8.29 years and in 2019 it increased to 8.75 years. This achievement is due to the seriousness of local governments to improve the quality of education. In 2019 Palu City has a high RRLS of 11.60 years or class 2 high school. There are two districts with very low RRLS, namely Donggala Regency (RRLS 7.86 years) and Parigi Moutong Regency (RRLS 7.47 years).

Effect of Health on HDI

Health is one of the determinants of HDI, an increase in spending in the health sector will increase the degree of health. If the degree of health increases, the HDI will increase and will have a positive impact on economic growth. Based on the results of the study, health sector spending has a positive and significant influence on HDI in Central Sulawesi.

In the previous description, it was stated that government spending in the health sector in 2015-2019 showed an increase, in 2015 health expenditure amounted to Rp331,630,944,401 decreased in 2016 (-0.61), expenditure amounted to Rp329,191,290,859. But in 2017 - 2019 expenditure continued to increase, in 2017 it was Rp381,951,315,198 to Rp424,150,984,866 or a growth of 11.04 percent. The increasing expenditure of the health sector also increased the HDI, in 2015 the HDI of 66.76 increased to 67.47 in 2016. In 2017 – 2019 HDI continues to increase from year to year. In 2017 it was 68.88 and in 2019 it was 69.50.

The central government allocates health budgets to each region, the increased HDI is an indicator of the success of local governments in managing health budgets. This research is in line with the research of Chotimah, 2017, and Adiny, Sari, 2018.

Effect of Per capita Income on HDI

Per capita income is the average income of people who are in a country or geographical area. Central Sulawesi's per capita income is obtained by dividing Central Sulawesi's GRDP by the total population in Central Sulawesi. Per capita income is used to determine the welfare of a region. An increase in per capita income will increase the

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HDI, but based on the results of research the per capita income of Central Sulawesi is negatively and significantly related to the HDI of Central Sulawesi. The increase in income in Central Sulawesi is uneven, and there is still a group of people who are less concerned about education. The increase in per capita income should be followed by an increase in HDI but this is not in accordance with the conditions in Central Sulawesi.

Increased economic growth will be followed by an increase in per capita income. Per capita income is expected to be enjoyed by the whole community, so that everyone is able to shop to meet the needs of life, food and non-food such as health and education.

CONCLUSION

Education Sector Expenditure has a negative but not significant effect on the HDI of Central Sulawesi for the 2015-2019 Period

Health Sector Expenditure has a positive and significant effect on the HDI of Central Sulawesi for the 2015-2019 Period

Per capita income has a negative and insignificant effect on the HDI of Central Sulawesi for the 2015-2019 period.

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