

Determinant Analysis of Human Development Index (HDI) in Semarang Residency

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ABSTRACT

This study aims to describe the direction and magnitude impacts of educators, health workers, and government expenditures of education, health, and social aid on the Human Development Index (HDI) in Semarang residency in 2016-2020. It used a quantitative approach with the descriptive design using the technique of documentation data collection. It also employed a quantitative approach with the descriptive design using the analysis of panel data regression. The results showed that the region with the highest level of human development was Salatiga city of Semarang residency. Based on the significant test, the educators (TENDIK) and government expenditure on health (KES) had a positive effect on the Human Development Index (HDI) while the health workers (NAKES), government expenditure of education (PEND), and social aid (BANSOS) took a negative effect on the (HDI).

Keywords: *Human development index, education and health workers, government expenditure on education, health, social assistance*

1. INTRODUCTION

Development is a process of change in various aspects leading to better improvements in economic activity. In essence, economic development is used by a country to improve a country's economy so that it is evenly distributed. Initially, economic development focuses on the success of a region with a high economic growth rate without considering other aspects [1]. In principle, development is a process of sustainable continuous improvement of the ideological system of a society or the entire social and cultural ideology to a better and more humanistic direction [2].

One the progress development can be seen from the quality of humans. Humans are the wealth of a country to be the main goal of development. Therefore, the quality of human resources has an important role in aspects of life. The migration of people from rural to urban areas is part of the development process. In addition to other reasons such as natural growth, human mobility activities are one of the causes of urbanization. [3] According to [4], the development process can be achieved by having abundant natural resources and relatively good human resources.

UNDP (United Nations Development Program) introduces the idea of measuring human development, called the Human Development Index (HDI). UNDP compiled a comprehensive index based on three

indicators of life expectancy at birth, adult literacy rate, average years of education, and literacy skill in purchasing power parity. The life expectancy indicator measures health; the adult literacy rate indicator and average years of education measures education; the purchasing power indicator measures living standards [5]. In Java Island, Central Java's average HDI in 2016-2020 ranked the 2nd lowest after East Java's. Central Java Province consists of 29 regencies and 6 cities. These cause many different characteristics and backgrounds. Each region has a variety of potential natural wealth, abundant natural resources, and socio-economics that can serve as an added value for increasing economic development. In addition, each region does not experience the same development and progress. The level of mobility of production factors between regions and human resources as measured in HDI [6].

Semarang residency is an area that has a dense population. Its territory consists of six regions - Kendal, Demak, Grobogan, and Semarang regency - and two cities - Semarang and Salatiga. The development of HDI in the area needs considering because it is the Central Java capital and has a densely populated industrial area.

According to [7], if expenditure decreases below the GDP, the HDI will increase significantly.

Conversely, if government expenditure increases above the GDP, the HDI will decrease. It reflects government policies. The government making a policy must bear the cost consequence. This expenditure is financed with the government budget as a government expenditure. The budget allocated to a region shows the government's commitment to the problems of the region.

[8] if human resources become a source of capital region development, the success of development by improving the quality of human resources is necessary to have adequate teachers or teaching staff. If the number of available educators meets the schools, it will have a positive impact on the success of human development. If the number of educators is low, it will slow down the success of human development [9].

Not only focusing on education to improve the quality of human resources, but it also requires proper health with adequate health services that affect a person's health. If the number of health workers is adequate, it will have a positive effect on health services that will increase the human development index. s if the number of health workers is inadequate or low, the community will use health services as well, which will decrease the value of the human development index., 2019).

2. LITERATURE REVIEW

According to [10] in human development, there are three main variables of adequacy, identity, and freedom.

1. Adequacy is humans' basic physiological need to meet their daily life, such as cloth, food, house, health, and safety.
2. Identity is part of a better life such as making advancements, respecting yourself, and feeling worthy of pursuing happiness and getting things.
3. Freedom is a human ability valuable in human development, called human freedom. Freedom can endure economically.

Sustainable development consists of three main aspects mutually and dependently integrated, namely economic sustainability, social, and environmental sustainability. SDGs mean the development that does not only meet the needs of the present generation but also the needs of future generations. It means ensuring the quality of human life that does not exceed and distract the capacity of the ecosystem. Therefore, the concept of SDGs is to meet the needs of contemporary society without distracting the development of future generations. According to Sudarmadji, sustainability is an activity that meets current. It is the exchange process between people and nature [11].

According to [10], rapid economic growth and income distribution can be achieved simultaneously by several countries. They must go hand in hand. The human development index is a dimension that measures the impact of a very large area's development capacity because it shows the quality of life expectancy, intelligence, and decent living standards of the people in a region. In the implementation of the development plan, the human development index also plays a role in the

direction of distribution to ensure priorities for policy formulation and determination of development plans. This is a guideline based on the policymaking usually determined by the policymaker and owner's policy [12].

John Dewey stated that the concept of education democracy contains the power to learn from the meaning of experience as the result of habit. The habit of intellect is the ability to organize activities actively that will lead to the development of individual and collective abilities. One form of growth is the standard value of school education as an extension of the effectiveness of aspiration realization. Educators are a means of increasing HDI by creating a generation of integrity and quality education.

According to the KBBI (Indonesian Language Dictionary), health is a condition in which the whole body and its parts are free from disease. According to Health Law Number 23 of 1992, health is a state of physical and mental health as well as a social environment so that everyone can lead a socially and economically productive life. The World Health Organization (WHO) defines health as a physical and mental condition and social well-being being free from disease or disability. Based on the definition of *health* above, it can be concluded that health is a physical, mental, and social condition without disease so that a person can perform his or her activities optimally.

Health development has currently been carried out through three main aspects, namely the health paradigm, health service reinforcement, and national health insurance. Health service reinforcement is taken by increasing access to health services, optimizing the system, and improving the quality of health services by using sustainable care methods and health risk-based interventions [13].

Government expenditure in education is a way to increase community productivity. The expenditure is channeled to infrastructure and education provision. The education budget is taken from the APBN at least 20 percent for the government's realization of education. This expenditure greatly affects the development of education. Community education can be continued to a higher level.

The smooth distribution of government expenditure in the health sector or funds for sanitation facilities affects the quality of public health services. The fund of sanitation facilities is provided to local governments to reduce disparities in the health sector between various regions in Indonesia. According to the WHO [14], to achieve the ideal health condition, a minimum budget of 15% to 20% of the APBN must be available because health must be a priority for the government. This also shows that the degree of local government commitment to health development can be reflected in the percentage of its health budget. If the percentage of the health budget is high, the local government's commitment to health development is also high. The quality of sanitation facilities in an area guarantees the quality of public health and enhances human development in the area.

To address economic disparities, the Indonesian government has formulated a policy of providing social assistance (BANSOS) to the Indonesian people. It means that local governments provide a social aid program in the form of funds or goods to poor individuals, families, groups, or communities to prevent the possibility of social risk. The Minister of Finance Regulation, Number 254/PMK.05/2015 concerning Social Aid Expenditures by Ministries/National Agencies states that social aid is government expenditure of budget transfers, goods, or services provided to the poor to protect the people from possible social risks and increase economic welfare or community welfare [15].

3. DATA AND MODEL

The population and samples in this study were all the regencies/cities in Semarang residency including Grobogan, Demak, Semarang, Kendal Regency, Salatiga, and Semarang. The secondary data were obtained from each local government's website. The data of the region's revenue and expenditure budget were obtained from the report of the Directorate General of Fiscal Balance of the Ministry of Finance (DJP KEMENKEU) while those of HDI and the number of education and health personnel from the report of the BPS (Central Statistics Agency).

The analytical tool employed the panel data regression analysis for determining the effect of the independent variable on the dependent variable. The panel data econometric model is as follows:

$$IPM_{it} = \beta_0 + \beta_1 TENDIK_{it} + \beta_2 NAKES_{it} + \beta_3 \log PEND_{it} + \beta_4 \log KES_{it} + \beta_5 BANSOS_{it} + \varepsilon_{it}$$

where **IPM**= Human Development Index, **TENDIK** = educators, **NAKES** = health workers, **Pend** = government expenditure in education, **KES** = government expenditure in health, **BANSOS** = social aid expenditure spending, β = regression coefficient, ε = coefficient of error, and **it** = observation i, year t.

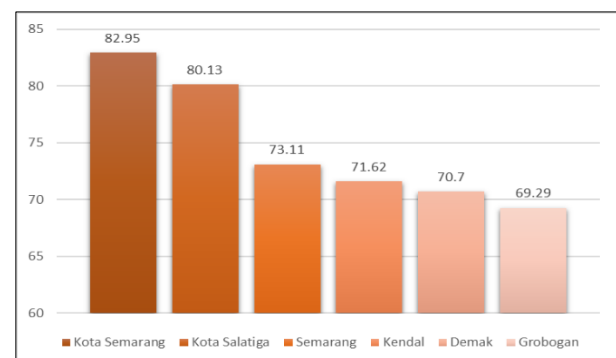
Tabel 2. Dimensions and Determinants Indicators of HDI

Variable Names	Symbols	Dimensions and Indicators
Educators	TENDIK	Number of teachers in the elementary, junior, and high school levels
Health workers	NAKES	Number of doctors, nurses, midwives, and pharmacists
Government expenditure in education	PEND	Region's budgets allocated to fund the implementation of affairs in the education sector

Government expenditure of health	KES	Region's budgets allocated to fund the implementation of affairs in the health sector
Social aid expenditure	BANSOS	The regional budget allocated to fund the implementation of social assistance aid

4. EMPIRICAL RESULTS

Picture 1. Average HDI in 2016-2020 Semarang Residency



Source: BPS Central Java Province

Picture 1 reports the development of HDI values in the 2016-2020 Semarang Residency. The highest HDI in Semarang city averaged 82.95. The lowest HDI in Grobogan averaged 69.29. The results of the panel data analysis with the three approaches are shown in Table 2. Based on the model selection test, both the Chow test and the Hausman described in Table 3, the best model to explain the data used the fixed-effect model (FEM). Figure 1 shows the development of HDI values in the 2016-2020 Semarang residency. The highest HDI in Semarang city averaged 82.95. The lowest HDI in Grobogan averaged 69.29.

Semarang city has the highest average HDI by excluding Semarang as the capital of Central Java province. Semarang city is known as a trade center and a service city of which economic growth is in the investment sector. In addition, Semarang city is an area that has access to facilities easier compared to other districts. In Grobogan regency, the lowest HDI averaged 69.29. The low average HDI in the area is due to high dropout rates of the SD/MI (Elementary School/Islamic Elementary School) and SMP/MTS (Junior High School/Islamic Junior High School) levels. In addition to these factors, the poverty rate is high and infrastructure is inadequate.

Table 2. Results of Panel Data Regression Estimation

Variables	Regression Coefficients		
	CEM	FEM	REM
C	270,2124	6,9340	270,2124
TENDIK	-0,0017	0,0006	-0,00167
NAKES	0,0032	0,0000	0,0032
LogPEND	2,7088	-1,0696	2,7088
LogKES	-9,9523	3,4703	-9,9522
BANSOS	0,0000	0,0000	0,0000
R ²	0,7344	0,9936	0,7334
Adj.R ²	0,6779	0,9902	0,6779
F-statistic	13,2076	295,8360	13,2076
Prob F-stat	0,0000	0,0000	0,0000

Source: Secondary data processed

Table 3. Best Model Test Results

$IPM_{it} = 6,9340 + 0,0006Tendik_{it} + 0,0000Nakes_{it} - 1,0696Pend_{it} + 3,4703Kes_{it} + 0,0000Bansos_{it}$					
P	TENDIK	NAKES	PEND	KES	BANSOS
value	0,0047	0,8415	0,0878	0,0004	0,9221
R ² = 0,9936; Adj R ² = 0,9902; F-Stat = 295,8360; Sig. F-Stat = 0.000000					

Source: Secondary data processed

Table 4. Results of Regression Analysis of Fixed Effect Model

Redundant Fixed Effects Tests (Chow test)			
Effect Tests	Statistic	d.f.	Prob.
Cross-section F	154,9256	(5,19)	0,0000
Cross-section Chi-square	111,9653	5	0,0000
Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	d.f	Prob
Cross-section random	774,6281	5	0,0000

Source: Secondary data processed

The panel data method used based on the combination of time series and region data can explain the distribution of data better. Time series data represented the observations from 2016 to 2020 while the cross-section data represented all districts/cities. The results of panel data analysis by using three approaches are reported in Table 2. Based on the model selection test, both the Chow test and the Hausman test are described in Table 3. The best model chosen to explain the data in this analysis is the Fixed Effect Model (FEM).

Effect of Educators on HDI

The variable of educators has a regression coefficient of 0.0006. The pattern of the relationship between educators and the human development index is linear so that if the teaching staff has an increase of 1%, the human development index will increase by 0.0006

index points. On the other hand, if the number of educators decreases by 1%, the human development index will decrease by 0.0006 index number.

The research results are relevant to the initial hypothesis and relevant to previous studies. Educators can improve the quality of education where educators act as teachers for the next generation and the development of a country. It also relates to the increase in human development because education is one of the indicators in the human development index, known as the knowledge dimension. In line with the research result by [16], the increasing number of educators will increase the HDI in preparation for the era of the demographic bonus by providing access to education, training, and decent work to increase productive people. Thus, it can increase the HDI. The education sector is the main sector in economic development by encouraging a long-term structural transformation process. Education as a rate of return in the future will make economic growth increase. It can enable opportunities to realize a decent quality of life.

Effect of Health Workers on HDI

The variable of Health Workers has a probability of 0.8415, which means that the high number of health workers in Semarang city does not affect the development of the community development index. The results of this study are irrelevant to the theory that states that health (health workers) is essentially a tool to improve human development. The results of this study are relevant to the research results [17], stating that health has no significant effect on the human development index. This can happen if the number of health workers is not sufficient or the number of health workers in each area is insufficient because these factors are an important sector in human development.

The Effect of Government Expenditure on Education on HDI

The variable of government expenditure in education has a probability of 0.0878. Thus, the variable of government expenditure of education has no effect on HDI in Semarang city. The results of the study state that the government expenditure of the health sector has no significant effect on the human development index. The research results [18] that the government expenditure on education does not take an effect on the human development index because of a high disparity in government spending. The focus of the government expenditure of education is on education. This is also because the focus of the government on regional physical development insignificantly takes an effect on the increase in the human development index.

The Effect of Government Expenditure on Health on HDI

The variable of government expenditure of the health sector has a regression coefficient of 3.4703 with a probability value of 0.0004 and it is significant at a degree of 1%. The pattern of the relationship

between the government expenditure of the health sector and the human development index is linear-logarithmic (lin-log) so that if the government expenditure of the sector increases by 1%, the human development index will increase by $3.4703/100 = 0.0347$ number index. On the other hand, if the government expenditure on health decreases by 1%, the human development index will decrease by $3.4703/100 = 0.0347$ index number.

As one of the independent variables influencing the human development index, government expenditure has a significant effect on the human development index. It can be said that if the health sector increases, it will increase the human development index. The results of this study are relevant to the initial hypothesis and previous research. The research results of the government expenditure that affect the human development index are those by Purba (2019), Omodero (2019), Ramada and Muhammad (2019), Baldacci, et al (2008), Mahulauw, et al (2016), Serang (2017), Tamara Yosi and Yeniwati (2020). Government expenditure on health shows the extent to which the economy is improving. Health functions as a benchmark in a person to carry out economic activities such as making an earning. The decline in the health sector will affect productivity in the economy, Gross Domestic Product (GDP). The health allocation fund also acts as a support for public health, measured using life expectancy as one of the dimensions of the human development index.

The Effect of Social Assistance Expenditure on HDI

The result of the analysis of the social aid expenditure variable has a probability of a 5% threshold value 0 that the variable does not take an effect on HDI in Semarang residency. This research result is relevant to that [19], showing that the social aid expenditure does not have a positive effect on the human development index. This condition can occur because the larger the budget allocated for social protection expenditure in Indonesian regions/cities, the less fiscal gap that Indonesian regions/cities can use to increase the human development index. This is because the social protection program has not become a priority for government management so the existing fiscal gap will be allocated for expenditure needs for other functions such as physical development.

5. CONCLUSIONS AND SUGGESTIONS

Referring to UNDP, the HDI is a measurement of human development using three indicators of education, health, and decent living standards. Educators included in education indicators can measure how much education a region has with local government expenditure. Health workers are an indicator of health with the presence of health workers and the amount of government expenditure of the health sector. Therefore, it can be said that an area has adequate health. Social aid is a form of government expenditure as equalization of economic quality by increasing a person's standard of

living to meet the daily needs of the population. The purpose of this study is to determine the direction and magnitude of the influence of education personnel, health workers, and government expenditures of education, health, and social aid.

Based on the results of research by using the Chow test and Hausman test, the model chosen is the FEM that shows the results of the validity of the effect (t-test) of education personnel and government expenditure of health sector have a positive effect on the HDI. Health workers, government expenditures, and social aid expenditures take a negative effect on the HDI. Simultaneously, the existence of the model test (F test) shows that these variables have an effect.

To increase the HDI in Semarang residency, it is hoped that the government can make policies that are more effective in realizing people's welfare. It needs to realize equitable development in the education and health sectors that are distributable to the people because the sectors can increase the HDI. It must also provide goods and services needed by the people equally to improve the community's economy and create various job opportunities to increase people's purchasing power, thereby increasing the HDI and people's welfare.

Future researchers are expected to be able to use more independent variables to find out other contributing factors of the HDI in Semarang residency. In addition, other researchers are expected to take several years to better compare the differences from year to year.

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