

# Panel Data Analysis of Government Policy on Human Development Index in Central Java Province

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## ABSTRACT

This study aims to find out how the Regional Government plays a role in increasing the Human Development Index in Central Java Province, in achieving this goal analysis is carried out using panel data analysis on government interventions in the education, nature, and consumption sectors of Central Java in the last five years. The data used in this study is secondary data obtained from the website. For data related to the APBD, it is obtained through the publication of the Ministry of Finance's DJPK. For the Human Development Index data and the total of education personnel, nature is obtainable from the publication of the Central Statistics Agency. Based on the results of the examination, it is savvy that the fixed effect model is the best in explaining the determinants between the human development index and the explanatory variables. In the analysis, it is also known that the variable number of educators and the variable number of nature workers have a significant effect on the growth of the Human Development Index, while the social assistance variable that reflects the level of consumption of the population of Central Java does not affect the Human Development Index. Thus, it can be concluded that the Human Development Index in Central Java is more influenced by interventions in the education sector and the health sector so that in achieving Central Java's human development targets, both sectors should receive special attention from the local governments as the policy-making authority.

**Keywords:** *Human Development Index, Number of Educators, Number of Health Workers, Community Social Assistance.*

## 1. INTRODUCTION

Article 34 paragraph (1) of the 1945 Constitution of the Republic of Indonesia provides a concrete basis for the implementation of social welfare in Indonesia, that law mandates the country to create social welfare for the realization of social justice for all citizens and ensure that the community can live well and with dignity. So, the task of the Government as the organizer of the State is to create welfare and prosperity for the community [1]. In realizing this, the governments through their powers are tasked with regulating the distribution of resources fairly and enough to all levels of society so that there are no development gaps and human development as an actor of state development can increase to general welfare achieved [2].

Todaro (2011) argued that [17] development is the process of making changes for the better. The development process includes various changes based on social status, community attitudes, and national institutions, in addition to pursuing accelerated economic growth, handling income inequality, and

poverty alleviation programs. Where development must reflect a total change in society or an adjustment of the social system by not ignoring the diversity of basic needs and desires of individuals and social groups that exist to move forward towards better living conditions, both materially. and spiritually.

In the perspective of the United Nations Development Program (UNDP), human development is formulated as a process of expanding choices for the population (enlarging the choices a people), which can be seen as an effort to expand choices as well as to increase people's living standards (UNDP, 1990). At the same time, human development can also be seen as a development of human capabilities through improving the level/level of nature, knowledge, and skills as good as the utilization (utilization) of these abilities/skills.

The Government of Indonesia's effort to determine the level of Human Development is by compiling the Human Development Index (HDI), which serves as a benchmark for achieving the quality of human development. In measuring the achievement of human

development, the Governments through the Central Bureau of Statistics use three basic dimensions that are used as a reference to size the Human Development Index, namely: a long and healthy life, knowledge, and a decent standard of living. a decent standard of life). Then BPS calculates these three dimensions through 4 elements, namely, life expectancy (AHH), literacy rate (AMH), the average length of schooling (RLS), and per capita expenditure in achieving a decent life (BPS, 2015). The HDI achievements in Central Java are described in Table 1 below:

**Table 1**  
Human Development Index in Central Java Province  
2016-2020

Province	Year				
	2016	2017	2018	2019	2020
Central Java	69.98	70.52	71.12	71.73	71.87

*Source: BPS, 2020*

Statistically, the HDI of Central Java Province recorded a positive trend, where there was an increase in the last five years. This increase is an indicator of the success of local government programs in Central Java in their efforts to improve the quality of human resources, one of which is by distributing more proportional allocations of financial assistance to Regency/City and village Governments, as well as encouraging investment opportunities through simplification and improvement. licensing services, as well as increasing regional infrastructure development.

Central Java province ranks third as the province with the most population in Indonesia after West Java Province ranks first and East Java ranks second. Therefore, the development of HDI in Central Java must be considered. Based on data released by BPS (2021), the city of Solo became the most populous city in Central Java in 2020 with a figure of 11,353.27 inhabitants per square kilometer. The population of Solo City in 2020 before recorded at 522,364 people. Meanwhile, Blora Regency is the Regency with the lowest population density compared to 35 Regencies/Cities in Central Java, namely 490.05 people per square kilometer with a total population of 884,333 people.

## 2. LITERATURE REVIEW

### 2.1 Human Capital

Human capital or human capital is the ability that exists within a person, can be expressed from the visible

or still hidden. A person's visible abilities can be reflected in the completion of daily work with the latest assessment of what someone in the organization can do, in other words, the capacity of an individual to perform various tasks in an organization's work [11].

Todaro [12] revealed that human capital can be measured through education and health. Education and training can be an added value for a human being. That can be explained if the higher a person's education or the more training they have, the higher their abilities and skills. Meanwhile, nature is an interrelated field with education. Higher education that is owned by without a healthy body will not increase productivity. Meanwhile, high education can also affect a person's level of health awareness

### 2.2. Human Development

In the UNDP (United Nations Development Program), human development is a process of enlarging people's choices. The concept or definition of human development includes a very wide dimension of development.

Human Development is a component of development through population empowerment which focuses on improving the human base. Development is calculated using the size of the total of education, health, and purchasing power. The higher the total obtained, the more the goals of development will be achieved. Development is a process to make changes for the better [7]. BPS 2017, Human Development Report (HDR) interprets human development as a process to increase the choices that humans have. The choices in question and the most important include the choice to live a long and healthy life, the choice to acquire knowledge, and the choice to have access to the resources needed to live a decent life [19].

### 2.3. Sustainable Development Theory

Sustainable Development Goals (SDGs) is a new goal that was inaugurated in 2015 as a follow-up to the end of the MDGs program. The contents of this document consist of 17 goals that try to combine the concepts of Economic Development Goals, Population Development Goals, and Environmental Development Goals which will create sustainability. The purpose of sustainable development is to meet the needs of the present by thinking about the needs of tomorrow.

### 2.4. Contribution of Human Development to Economic Growth

Development is a tool used to achieve the nation's goals. While economic growth is one of the

indicators to assess the success of development in a country [18]. Development is a process of change in numerous ways towards a better improvement in economic activity. Economic development is used by a country to improve the economy of a country so that it is evenly distributed. Initially, economic development focused on the success of experiencing a region with high economic growth without considering other aspects [8]. One of the progresses of development is visible from the quality of humanity itself. Humans are the wealth of a country which is the primary goal of development. Therefore, the quality of human resources has a significant role in aspects of life.

## **2.5. Human Development Index**

Quoting the contents of the first Human Development Report in 1990, human development is a process to increase the choices that humans have, through empowerment efforts that prioritize increasing basic human abilities so that they can fully participate in all areas of development. According to BPS, the Human Development Index (HDI) measures human development achievements based on some basic components of quality of life. HDI is built through a basic three-dimensional approach. These dimensions include long and healthy life, knowledge, and a decent life which categorized into four groups with the following criteria:

1. Very high:  $IPM \geq 80$
2. High:  $70 \leq IPM < 80$
3. Medium:  $60 \leq IPM < 70$
4. Low:  $IPM < 60$

### **2.5.1. Education in IPM Improvement**

Todaro [13] explained that education has a particularly significant role in shaping the ability of society to absorb modern technology and to develop the ability to create growth and sustainable development. Sijabat, [16] in the Portrait of Indonesian Education by BPS, according to the theory of human capital, mentioned that education is part of investment in human life. That means that a person can increase his income through increased education because, with an increase in education, the knowledge and skills possessed can upgrade and can affect the upgrade in a person's productivity which will make them superior and have high competitiveness in each area of life.

### **2.5.2. Local Government Expenditures in the Education Sector**

Education has a significant role in improving human resources. Education entirely influences the

nation's economic growth. Expenditures on the development sector can be allocated for the provision of educational infrastructure and providing education services to the entire population of Indonesia equally. The education budget of 20% of the APBN is a manifestation of the government's realization to improve education. The governments place education as a crucial factor in supporting national development [3]. In general, the government budget can be interpreted as a financial plan that reflects policy choices for a period in the future.

### **2.5.3. Health in Improving Human Development Index**

Becker [15] stated that one way to invest in human capital is to improve emotional and physical health. The more the governments spend on the health sector, the more likely people will live a healthy life. In the human development index, there is also a health index in which there is a life expectancy, where people who have good health will have a long life which is likely to also affect their quality of life. Health problems are a basic need for every human being, without public health, it cannot produce products for the country. A country's economic activities will run if there is health insurance for every resident.

### **2.5.4. Local Government Expenditures on the Health Sector**

Health is one indicator to see the welfare of society. Through the allocation of government spending in the health sector, it is hoped that it will provide opportunities for all people in Indonesia to obtain health services. Several programs that have been carried out by the government to make it easier for the public to access health services are free health programs, nature insurance, and the use of poor cards [1]. The 1945 Constitution states that health is a base human right that governments are responsible for meeting the needs of health protection and facilitation for their people. Moreover, in the national development goals, it has been stated that every citizen has the right to obtain the highest degree of health. So, it is natural that health can be called a government investment in development spending for human resource development [4].

### **2.5.5. Public Welfare**

According to Prabawa (1988), welfare is often defined broadly as prosperity, happiness, and quality of human life secondary at the individual level or in family and community groups. Property can become demonstrated by the ability to seek family resources to

meet the needs of goods and services thus that are considered important in family life. So, welfare is the fulfillment of all needed, both goods, and services in meeting the needs of the families.

The concept of welfare according to Nasikun [14] can be formulated as the equivalent meaning of the concept of human dignity which can be seen from four indicators, namely security, welfare, freedom, and identity. These indicators are used to seeing the level of welfare which creates a sense of security, well-being, liberty, and a person's identity in meeting their needs.

**2.5.6. Community empowerment**

Empowerment are a continuous movement and process to generate potential, strengthen participation, build civilization and community independence. According to Law No. 6 of 2014 concerning villages, community empowerment is an effort to develop community independence and welfare by increasing the knowledge, attitudes, skills, behavior, abilities, and awareness of the community. Government Regulation No. 72 of 2005 concerning villages states that community empowerment means that the administration of governments and the implementation of village development shown to improve the standard of living and welfare of the community through the establishment of policies and programs and then activities that are under the essence and priorities of community needs.

**2.5.7. Government Expenditure on Social Fund**

To address economic disparities, the Indonesian government has formulated a policy of providing social assistance (bansos) to the Indonesian population. What is meant by social help is that regional governments assist in the form of money or goods to individuals, families, groups, or communities that are unsustainable and selective to prevent the possibility of the social risk occurring. Meanwhile, according to the Regulation of the Minister of Finance Number 254/PMK.05/2015 concerning Social Assistance Expenditure by Ministries/National Agencies, Social Assistance is defined as expenditure in the form of budget transfers, goods, or services provided by the government to the poor or unable to protect the community. from exemptions that are affected by possible social risks, increased economic capacity, and or community welfare (D Agnes Sediana Milasari, 2020).

**3. METHOD**

This study uses secondary data obtained from the Website. For data related to the APBD, it is obtained through the publication of the Ministry of Finance's

DJPK. Data for HDI and the total of the education and health personnel is obtainable from the publications of the Central Statistics Agency.

This study is focused on looking at the effect of the variables Number of Educators (Educ), Number of Health Workers (Heal), and Government Expenditure on Social Assistance (Gov) on the Human Development Index (HDI). With these variables the independent instrument in the model to be built refers to the following description:

**Table 2.** Dimensions and Indicators of Central Java HDI Determinants

Variable Name	Symbol	Dimensions and Indicator
<b>Number of Education staff</b>	Educ	The total of teachers/teaching staff from kindergarten, elementary, junior high, high school, vocational schools in all districts/cities in Central Java Province during the years five years during the 2016-2020 period and is presented in units (people).
<b>Number of Healthcare Professional</b>	Heal	Number of Doctors, Nurses, and Midwives in all areas of Central Java Province within a period of 5 years during the 2016-2020 period and is presented in units (people)
<b>Social Fund</b>	Gov	The total allocation of funds sourced from the APBD which is distributed to all regions in Central Java Province within a period of 5 years during the 2016-2020 period is presented in Rupiah units.

The analytical tool used in this study is panel data regression analysis (a combination of time series data with cross-section data) which is 35 Regency/City data in Central Java Province for a period of five years starting from 2016 to 2020. The mathematical model in This research is structured as follows:

$$HDI_{it} = \beta_0 + \beta_1 Educ_{it} + \beta_2 Heal_{it} + \beta_3 Gov_{it} + \epsilon_{it}$$

where:

HDI = Human Development Index

EDUC = Total of education personnel; Kindergarten, SD, SMP, SMA, SMK (Total of people)

HEAL = Total of health workers; some doctors, nurses, and midwives (Total of people)  
 GOV = Social Fund (Rupiah)  
 $\varepsilon$  = Error term  
 $\beta_0$  = constant  
 $\beta_1 \dots \beta_3$  = Independent variable regression coefficient  
*i* = Observation to *i*  
*t* = Year to *t*

**4. RESULTS AND DISCUSSION**

The development of the Human Development Index that occurred in Central Java Province during the period 2016 to 2020 showed an average of 71,044, so, the average value of the Regency/City HDI in Central Java Province is the highest who is above the average HDI in Java. Central Java is the City of Semarang, which is 82,432, while the average value of the Regency/City HDI in Central Java Province is the lowest who is below the average HDI value of Central Java, namely Brebes Regency, which is 65.35.

The city of Semarang occupies the first position with a significant increase in HDI. The indicator that most influences the upgrade in HDI in Semarang City is Community Welfare. To improve the welfare of the community, the Semarang City Government has carried out some program innovations that are directly right on the goal, namely improving the welfare state of the people in the city of Semarang. According to available BPS data, it shows that the HDI in Brebes Regency has increased, though it has increased, the HDI of Brebes is still the last of 35 Regencies/Cities in Central Java Province. Even so, the HDI in Brebes Regency is in the medium category, because in Central Java itself there are no areas with a low HDI category. The cause of the low HDI in Brebes Regency is the low average length of schooling.

**4.1. Panel Data Analysis Results**

The panel data method is used in this study because this study uses combined data between time series data represented by observations from 2016 to 2020, while cross-section data deputize all regencies/cities throughout Central Java Province. The results of panel data analysis with the three approaches are as shown in table 3. Based on the model selection test, both the Chow test and the Hausman test described in Table 4, the best model chosen to explain the data in this analysis is the Fixed Effect Model (FEM).

**Tabel 3.** Panel Data Analysis Results

Variabel Name	Coefficient		
	PLS	FEM	REM
C	73.16098	68.50551	68.88179
EDUC	-0.000672	0.000137	9.29E-05
HEAL	0.002613	0.000861	0.000893
GOV	-2.35E-11	2.67E-12	2.09E-12
R <sup>2</sup>	0.437149	0.979772	0.208034
Adj R <sup>2</sup>	0.427274	0.974308	0.194140
F-statistic	44.27008	179.3413	14.97281
Prob F-stat	0.000000	0.000000	0.000000

Source: Processed Results E-Views 9

**Tabel 4.** Best Model Test Results

Redundant Fixed Effects Tests (Chow test)			
Effects Tests	Statistic	d.f.	Prob.
Cross-section F	108.087702	(34,137)	0.0000
Cross-section Chi-square	582.036626	34	0.0000
R <sup>2</sup> = 0.437149; F-Stat = 44.27008; Sig. F-Stat = 0.000000			

Source: Processed Results E-Views 9

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	37.867830	3	0.0000
R <sup>2</sup> = 0.979772; F-Stat = 179.3413; Sig. F-Stat = 0.000000			

Source: Processed Results E-Views 9

**Tabel 5.** Fixed Effect Model Regression Analysis Results

HDI <sub>it</sub> = 68.50551+0.000137 Educ <sub>it</sub> +0.000861Heal <sub>it</sub> + 2.67E <sup>-12</sup> Gov <sub>it</sub>			
P-value	Educ 0.0017	Heal 0.0000	Gov 0.5163
R <sup>2</sup> = 0.979772; Adj R <sup>2</sup> = 0.974308; F-Stat = 179.3413; Sig. F-Stat = 0.000000			

Source: Processed Results E-Views 9

Based on the results of the analysis in Table 5. the number of education personnel and the number of health workers have a positive influence on the number of the Human Development Index in Central Java Province,

while the government assistance variable is known to not influence the achievement of HDI in Central Java.

#### ***4.2. The Influence of Number of Education Staff on Human Development Index***

The output of the regression results shows that the educator variable has a positive and significant influence on the Human Development Index in Regencies/Cities in Central Java Province in 2016-2020 with a regression coefficient of 0.000137. So, if the teaching staff has an upgrade of 1 person, the Human Development Index will increase by 0.000137 index numbers. On the other hand, if the number of educators decreases by one person, the Development Index will decrease by 0.000137 index number.

This is under research of Hamdan [6] entitled Ratio of Educators, Ratio of Health Workers, and Achievement of Human Development in Indonesia in Spatial Analysis, that the increasing number of educators will increase the human development index as preparation for the era of demographic bonus by providing access to education, training, and decent work to increase the population. productivity is then offset by an increase in the human development index.

#### ***4.3. Effect of Number of Healthcare Professionals on Human Development Index***

Based on the results of panel data regression, it shows that the health worker variable has a positive and significant influence on the Human Development Index in Regencies/Cities in Central Java Province in 2016-2020 with a regression coefficient of 0.000861. So that if health workers experience an increase of 1 person, the Human Development Index will increase by 0.000861 index number. On the other hand, if the number of health workers decreases by one person, the Development Index will decrease by 0.000861 index number. The results of this study are under the research conducted by Dianaputra [5] with the research title The Effect of Government Financing in the Education and Health Sector on the Human Quality Index and Economic Growth in the Regency/City of Bali Province in 2011-2015, with the results of the study showing that government financing in the health sector has a positive and significant effect on the Human Development Index. This shows that increasing the level of health through an increase in the number of health workers will encourage an upgrade in the quality of human resources.

#### ***4.4. The Effect of Community Social Assistance on Human Development Index***

Based on the results of the panel data estimation, it shows that the variable of community social assistance has no significant effect on the Human Development Index in Regencies/Cities in Central Java Province in 2016-2020 with a regression coefficient of 2.67E-12 and a probability of 0.5163. meaning, the size of the community social assistance does not affect the Human Development Index in Regencies/Cities in Central Java Province.

The results of this study are the same as those conducted by DBB [10] that social assistance spending does not have a positive effect on the human development index. This condition can occur because the distribution of Community Social Assistance funds has not been evenly distributed. So that this does not have a direct influence on increasing the Human Development Index, as well as data on recipients of social assistance with population data that is not yet appropriate, so that the distribution of the Ministry of Social's social assistance program is not yet on target.

### **5. CONCLUSION**

The governments through their powers are tasked with regulating the distribution of resources fairly and enough to all levels of society so that there is no inequality in development and human development as an actor of state development can increase and general welfare can be achieved. Human development can also be seen as a development of human capabilities through improving the level/level of health, knowledge, and skills nor the utilization (utilization) of these abilities/skills. The Government of Indonesia's effort to determine the level of Human Development is by compiling the Human Development Index (HDI), which serves as a benchmark for achieving the quality of human development.

Human capital is the ability of what is in the government through its powers is tasked with regulating the distribution of resources fairly and fairly to all levels of society so that there is no inequality in development and human development as an actor of state development can increase and general welfare can be achieved. Human development can also be seen as a development of human capabilities through improving the level/level of health, knowledge, and skills nor the utilization (utilization) of these abilities/skills. The Government of Indonesia's effort to determine the level of Human Development is by compiling the Human Development Index (HDI), which serves as a benchmark for achieving the quality of human development.

it can be concluded that the test results of selecting the best estimator model from the Chow test and the Hausman test prove that the Fixed Effect Model (FEM) is the chosen model. Based on the existing test of the model, the selected Fixed Effect Model (FEM) proved that the estimated model exists, which means that simultaneously the variables of the number of educators, the number of health workers, and community social assistance affect the human development index. With the coefficient of determination (R<sup>2</sup>) of 0.9798, it means that 97.98% of the variation in the Human Development Index variable can be explained by the variable number of educators, some health workers, and community social assistance. The remaining 2.02% is influenced by other variables outside the model.

Based on the results of panel data regression analysis from the t-test, it can be explained that the number of educators, the number of health workers has a positive and significant effect on the Human Development Index, while community social assistance has a positive and insignificant stock on the Human Development Index in Central Java in 2016-2020. Thus, it can be concluded that the number of educators and the number of health workers have a major influence on the Human Development Index in each district/city. The researcher argues that the impact of community social assistance is not yet significant in the Regency/City of Central Java Province because the distribution of Community Social Assistance funds has not been evenly distributed. So, this does not have a direct effect on increasing the Human Development Index. Mentioned that some regions had not 100 percent matched the data on recipients of social assistance with population data so that the distribution of the Ministry of Social's social assistance programs had not been well-targeted.

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