DETERMINANTS OF HUMAN DEVELOPMENT INDEX ON JAVA ISLAND: ANALYSIS OF ECONOMIC–SOCIAL FACTORS

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ABSTRACT

The HDI is a summary of three dimensions: health, educational attainment, and decent living standards. This study aims to determine the effects of economic growth, poverty, government expenditure on health and education, unemployment, mean years of schooling, and life expectancy on the HDI. The method used is Ordinary Least Squares (OLS), and the data analysed is secondary data from 2023. The research scope is the island of Java, comprising 119 districts/cities to be analysed. Many researchers have conducted research on HDI, but there are still inconsistencies in the results of these studies; therefore, this study was conducted. The results show that education expenditure, unemployment, mean years of schooling, and life expectancy, when considered together, significantly affect HDI. Education expenditure, mean years of schooling, and life expectancy have a significant positive effect, while unemployment has a significantly negative effect on HDI. In addition, economic growth, poverty, and health expenditure insignificant effect on HDI.

Keywords: Human Development Index (HDI), Economic Growth, Poverty, Government Expenditure, Unemployment
JEL Classification: G18, G21, G28

I. INTRODUCTION

Economic development is understood as economic growth, measured by indicators of a country's income or production, analysed over a period of time. Development is basically centred on human development. To assess the level of human development, a country uses the Human Development Index (HDI). The HDI is a summary of three dimensions: health, educational attainment, and a decent standard of living (UNDP, 1990). HDI aims to provide information on a country's development, taking into account key issues that affect people's well-being.

A region with a large number of skilled workers indicates that it has experienced an increase in HDI. An important aspect of a country's economy is how it uses its resources effectively. Human resources, as an important role in the nation's development, is a significant concern for policy decision-makers. Human resources are both people and entities of development. This shows that humans are not only the target of development but also the actors of development (Suhendi & Astuti, 2023).

Investments in human capital, people's lifelong health, education, and abilities are crucial for maximising their potential and determining countries' future productivity, constituting the lion's share of global wealth and a critical pathway to ensuring sustainable and inclusive growth for all. Countries cannot compete successfully in the global economy, sustain economic development, or equip their workforces for the high-skilled jobs of the future without human capital (Strokova et al., 2022).

Indonesia is a country with a total population of 282 million, and each region has different geographical and economic conditions. According to Central Statistics Agency of Indonesia (2023). Java Island has the largest population in Indonesia, with a total population of 157 million. As the centre of economic activity in Indonesia, Java Island has more adequate infrastructure for economic development.
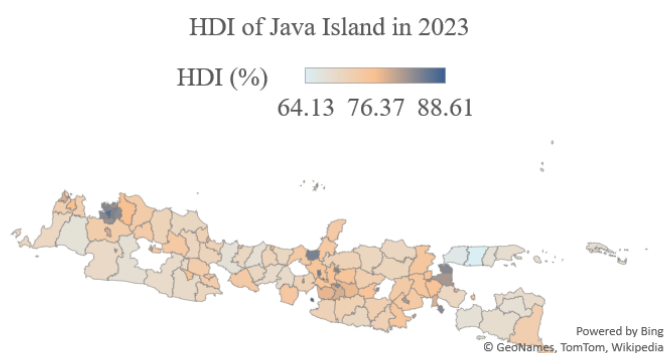

Figure 1. Human Development Index of Java Island
Source: BPS, 2023

In 119 districts on the island of Java, values range from 64.13 to 88.61. The average HDI on Java Island is classified as medium-high. The highest HDI on Java Island is in Yogyakarta City, at 88.61, while the lowest is in the Sampang district, at

64.13. This demonstrates that Java's provinces and districts/cities still differ in terms of human development. To achieve sustainable human development, research must determine the components that influence HDI. According to BPS (2023) report, there are 4 groups in the achievement of HDI: HDI > 80 is classified as very high; HDI 70-80 is classified as high; HDI 60-70 is classified as medium; HDI < 60 is classified as low. A region can improve its HDI to a higher level (>80). Therefore, a strategy needs to be developed in order to reach this level. It is also necessary to understand the factors that can elevate HDI to a higher category.

Researchers use economic to social variables to understand the factors that affect HDI. The research conducted by Suhendi & Astuti (2023) which uses independent variables such as poverty level, GDP, and government expenditure on health and education in Papua province, shows that the three variables have a significant effect on HDI. While the research by Dewi (2021) found that economic growth had no significant effect, the researchers also included unemployment and poverty as factors affecting HDI. In the research of Setiawan & Ariani (2022) on West Java province, which analysed the human development index with panel data from 2015 to 2019, the results showed different results on the education expenditure variable. The analysis showed that this variable had no effect on HDI, whereas the poverty and health expenditure variables had significant effects. This difference in findings underscores the importance of further research to clarify the relationship between variables in the specific context of Java Island.

This study aims to examine the effect of poverty, economic growth, education and health expenditure, unemployment, average years of schooling and life expectancy on HDI variables. Using the latest data across different regions can provide new perspectives on previous studies. Knowing which variables are influential can provide the government with steps to formulate policies to increase HDI.

II. LITERATURE REVIEW

Economic growth is the process by which a nation's economy changes over time in order to improve its financial status. The indicator of economic growth is measured as a percentage of gross domestic product (GDP). GDP is calculated as the total income from the production of products and services, as well as the overall economic expenditure on newly produced commodities and services over a given time period. Generally speaking, economic expansion is equivalent to an increase in output capacity achieved through national income growth (Mankiw, 2003). Economic growth and human development are closely related. On the one hand, economic expansion makes it feasible to improve HDI by providing the necessary resources. However, raising the calibre of the workforce plays a significant role in promoting economic expansion (Ranis et al., 2000).

In the empirical literature, the relationship between the human development index and economic growth (EG) has attracted the attention of economists and

researchers. Ranis et al (2000) stated that there is a strong correlation between EG and HDI, and economic growth is an important input for increasing HDI. The research shows that increasing HDI cannot be postponed by focusing solely on other resources to boost economic growth. If economic growth increases, the government can provide adequate education and health facilities to increase HDI (Feriyanto, 2016). Other research on the effect of economic growth on HDI was also conducted by Liu et al (2023) the results showed that economic growth significantly effect on HDI. Another study was also conducted by (Suhendi & Astuti, 2023). In Papua, with a low HDI value every year, economic growth has a significantly positive influence on HDI. If economic growth increases by 1% it will be followed by a 1% increase in HDI.

In addition to economic growth, HDI researchers also add poverty variables to determine its effect on HDI (Fattah, 2012). Poverty is the state of being extremely poor when a person does not have enough monetary resources or has few possessions to live at a comfortable standard in society. The World Bank describe poverty as the inability to achieve a minimum standard of living, with per capita household income and expenditure as an adequate benchmark.

Research related to poverty in North Bengkulu was conducted by Saputro (2022), poverty has a negative effect on the human development index. This is because poverty hinders access to proper education and health. The same result found by research conducted by Suhendi & Astuti (2023) & Nasution et al (2024). Al-Nasser & Al Hallaq (2019) stated that indigence has a negative correlation, which means the government in Jordan should improve their policies to increase life expectancy, educational attainment, and income of Jordanian citizens. Government spending is part of fiscal policy where the government can make expenditures toward to obtain goods and services to meet the needs of the community through the procurement of goods and services. This policy plays a role in determining the development of the country (Azwar, 2016). Government spending on human development is in the form of spending on health and education. Increasing life expectancy and education must begin with the provision of adequate health and education facilities because health function expenditures affect the increase in HDI, community productivity is improved through government spending in the form of non-physical expenditures on health facilities (Ani, 2023). Research conducted by Oluwatobi & Ogunrinola (2011) shows that spending on health and education functions has a positive influence on human development. The education gap between the United States and Mexico has significant implications for human development. Education should be a key factor in human development.

Another macroeconomic factor that affects HDI is unemployment. A person is categorised as unemployed if he or she is not working, is looking for a job, or is on temporary layoff (Mankiw, 2003). In Saudi Arabia, the unemployment rate shows a negative relationship to HDI, and an increase in unemployment results in a decrease in HDI value (Al-Nasser, 2012). Similar results were also found by Priambodo (2021)

those who examined economic growth and HDI in Purbalingga; unemployment has a significant effect on both dependent variables. Another case with research by Dewi, K.S et al.,(2021) & Handalani (2018) which came to the conclusion that HDI is not impacted by unemployment. This demonstrates that there are still discrepancies between HDI research and the employment independent variable.

In addition to macroeconomic determinants, this study also analyses social factors, namely mean years of schooling and life expectancy. The number of years the population has completed at all educational levels is known as the average years of schooling. The calculation is carried out at the age of 25 and above (Conceição, 2024). Average years of schooling influence HDI (Septiawan et al., 2018). Increased average years of schooling can raise the HDI (Zulfa et al., 2018). Another social factor is life expectancy: the anticipated lifespan of a newborn if the current trend of age-specific mortality at birth holds true throughout the infant's life. HDI is significantly positively affected by life expectancy, indicating that an increase in life expectancy contributes to the HDI (Jalil & Kamaruddin, 2018).

III. METHODOLOGY

The Central Bureau of Statistics provided secondary data for this study on 6 provinces on Java Island: East Java, Central Java, West Java, Banten, DKI Jakarta, and the Yogyakarta Special Region, and government expenditure data from the Directorate General of Fiscal Balance. The selected data are cross-sectional, namely 119 districts/cities on Java Island in 2023.

The method used is Ordinary Least Squares (OLS), a statistical method used to estimate a multiple linear regression model and assess the correlation between dependent and independent variables (Gujarati, 2004). To ensure the model is BLUE (Best Linear Unbiased Estimator), the researcher needs to first conduct a classical assumption test. The classical assumption test for cross-sectional data consists of 3 tests, namely normality, multicollinearity, and heteroscedasticity.

To determine whether the data are normally distributed, a normality test is used. Furthermore, to assess whether the independent variables do not exhibit a strong linear relationship, the multicollinearity assumption is required. While the heteroscedasticity test assesses whether the variance of the residuals remains constant across the range of independent variables, if this condition is not met, the regression model can yield inefficient estimates, and the results of hypothesis testing will be invalid. For multiple linear regression models obtained as follows:

$$YHDI = \beta 0 + \beta 1EG + \beta 2Pov + \beta 3EH + \beta 4EEd + \beta 5Unp + \beta 6MYS + \beta 7LExp + \varepsilon$$

The model can be understood as follows: the YHDI is the dependent variable, and it is influenced by several independent variables. These variables are economic growth (EG), poverty rate (Pov), government spending on health (EH) and education (EEd), open unemployment rate (Unp), and social factors in the form of mean years

of schooling (MYS), and life expectancy (LExp). β0 indicates a constant, while β1-β7 are the regression coefficients that illustrate how independent factors affect HDI. Additionally, ε is an error term that captures unmodeled elements.

IV. RESULTS AND ANALYSIS

Descriptive statistics of research data is a method for presenting, summarising, and describing the main characteristics of a set of data in quantitative terms. The aim is to provide an overview of the pattern, distribution, and tendency of the data before further analysis is carried out. The statistical description is shown in Table 1.

Table 1. Descriptive Statistics

VARIABLE	MEAN	MAX	MIN	STD. DEV	OBS
HDI	74.79319	88.61000	64.13000	5.181719	119
EG	4.968487	9.760000	1.200000	0.993347	119
POV	9.389328	21.76000	2.380000	3.800791	119
EH	11.28206	14.28551	8.975883	0.904523	119
EED	12.35274	14.60397	10.07407	0.834093	119
UNP	5.560000	10.52000	1.520000	2.022611	119
MYS	8.699832	12.11000	5.070000	1.625842	119
LEXP	73.41336	77.93000	65.58000	2.472241	119

The normality assumption test is used to assess the data during data processing. If the Jarque-Bera probability value is greater than 0.05, the data are normally distributed; if it is less than 0.05, the data are not normally distributed. The outcomes of the normalcy assumption test are as follows:

Table 2. Result of Normality Test

JARQUE-BERA	0.418654
PROBABILITY	0.811130

Based on Table 2, the results of the normality test indicate a p-value of 0.418654 for the Jarque-Bera test. This value shows the results are> 0.05, so the data are normally distributed. The next classic assumption test is the multicollinearity test. This test is fulfilled if the VIF value of one of the independent variables is less than 10.00, and vice versa.

Table 3. Result of Multicollinearity Test

VARIABLE	CENTERED VIF
EG	2.580770
POV	1.103332
EH	3.204536
EED	3.309697
UNP	1.563033

MYS	3.189419
LEXP	1.907838

Based on Table 3, the multicollinearity test shows a value <10.00; it can be inferred that the multicollinearity assumption has been satisfied or that the data do not exhibit multicollinearity. The heteroscedasticity test is the last assumption test; the Glejser test is used to determine whether heteroscedasticity is present. Obs * R-squared probability values are greater than 0.05, then the heteroscedasticity assumption test is met; if the Obs * R-squared value <0.05, then the assumption cannot be met.

Table 4. Result of Heteroscedasticity Test

F-STATISTIC	1.654505	PROB.F(7,111)	0.1276
OBS*R-SQUARES	11.24315	Prob.Chi-Square (7)	0.1284
SCALED EXPLAINED SS	11.94171	Prob. Chi-Square (7)	0.1025

Table 4, Obs * R-Squared value of 0.1284 from the Glejser method test indicates that the heteroscedasticity assumption test is satisfied because the value is greater than 0.05. After all the classical assumption tests are fulfilled, the next step is to perform the purpose of regression analysis, which is to ascertain how the independent variable affects the dependent variable. By comparing the t-statistic with the t-table, one can determine whether a variable affects the dependent variable. If the t-statistic value is greater than the t-table, then the two variables are influenced. The regression analysis's t-table is 1.68570 when α=5% the outcomes of multiple regression are as follows:

Table 5. Result of Regression Estimate

VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB
C	34.48080	4.995273	6.902686	0.0000
EG	-0.005668	0.051304	-0.110471	0.9122
POV	0.067117	0.128353	0.522906	0.6021
EH	-0.378286	0.240224	-1.574720	0.1182
EED	0.680513	0.264748	2.570415	0.0115
UNP	-0.181451	0.075028	-2.418431	0.0172
MYS	2.997397	0.133331	22.48087	0.0000
LEXP	0.147463	0.067816	2.174458	0.0318
R-SQUARED	0.939091		F-statistic	244.4838
ADJ R-SQUARED	0.935250		Prob(F-statistic)	0.000000

On the table 5, the regression analysis results of 7 independent variables show the partial test (T test) as follows: variable EG t-statistic value < t-table or -0.110471 < 1.68570 then variable EG insignificant effect on HDI; variable POV t-statistic value < t-table or 0.522906 < 1.68570 then variable POV insignificant effect on HDI; variable EH t-statistic value < t-table or -1.574720 < 1.68570 then variable EH insignificant effect on HDI; variable EEd t-statistic value > t-table or 2. 570415 > 1.68570, the EEd variable significant effects on HDI; variable Unp t-statistic value > t-

table or -2.418431 > 1.68570, the Unp variable significantly affects on HDI; variable MYS t-statistic value > t-table or 22.48087 > 1.68570, the MYS variable significantly affects HDI; variable LExp t-statistic value > t-table or 2.174458 > 1.68570, the EH variable significantly affects on HDI.

It may be inferred from the analysis of the F test (simultaneous) results value of 244,483 with a prob. If the f-statistic value is 0.0000 or <0.05, it can be concluded that the independent variables simultaneously have a significant effect on the dependent variable. With an adjusted R-squared coefficient of determination of 0.935, this means that the effect of the independent variables is 93.5%, while the remaining 6.5% is explained by variables not included in the model.

The investigation's results demonstrate that HDI is unaffected by economic growth. This is consistent with earlier studies carried out by Dewi (2021) which states that economic growth has no significant effect on HDI. This finding indicates that an increase in GDP does not automatically improve the quality of human development, nor does it mean that there is still an unequal income distribution in the community. In addition, human development requires an approach that is in line with repair the quality of health and education (UNDP, 1990). And uneven economic growth often has little impact on HDI.

Analysis of regression results shows that poverty has insignificant on HDI, this is in line with research conducted by Hasibuan et al (2020) which analyses the determination of poverty on HDI in Indonesia. This means that other variables affect HDI more, such as easier access to education and health, or other macroeconomic variables, such as unemployment. The results of the analysis show that government spending in the health sector does not have a significant effect on HDI, consistent with prior research that has been done Jalil & Kamaruddin (2018). Health expenditure that has no effect on HDI can result from suboptimal budget allocation, in which funds allocated do not directly improve health services. Other economic and social factors are also important in HDI growth.

Regression analysis of the Education expenditure variable on HDI shows that education expenditure has a significant positive effect on HDI. This is in accordance with research conducted by Oluwatobi & Ogunrinola (2011) & Kairo & Okeke (2020). With a coefficient of 0.680, for every 1-unit increase in health expenditure, the HDI increases by 0.680 units. Education increases people's ability to contribute more to the growth and development process. Increased education increases income capacity, productivity, access to health information and improved human resource development.

According to the linear regression study, HDI is significantly negatively affected by unemployment; a 1% increase in unemployment results in a 0.181% decline in HDI. So the regression results are in accordance with the research conducted by Arriani & Chotib (2021); Al-Nasser & Al Hallaq (2019); Priambodo (2021) i.e. unemployment has a significant effect on HDI. Economic health will be

disrupted if the unemployment rate is high, not only affecting the government but also the environment, families, and others. In addition, unemployment can lead to crime, poverty, and lower human development standards. Therefore, an increasing unemployment rate will lower the development index.

The estimation results show that the mean years of schooling variable has a significantly positive effect on HDI. When average years of schooling increase by 1%, the HDI increases by 2.997%. The outcome of this study is in accordance with research Septiawan et al (2018) & Zulfa et al (2018). Average years of schooling indicate the success of the education system or the equitable allocation of education funds. Education is a key pillar of human development, as it shapes people's skills and productivity (Priambodo, 2021). Life expectancy has a significant positive effect on HDI. The coefficient for this variable is 0.147; this means that when life expectancy rises by 1%, HDI will increase by 0.147%. This is similar to a previous study conducted by Liu et al (2023) which concluded that the achievement of high HDI in developing countries is measured by life expectancy indicators that show a person's health and longevity.

V. CONCLUSION AND RECOMMENDATION

According to the results of the multiple linear regression, the HDI is significantly affected by life expectancy, average years of education, unemployment, and education spending, all simultaneously. While unemployment has a large negative impact on HDI, life expectancy, and mean years of schooling, all significantly increase HDI. The determination coefficient (R-squared) of 0.935 indicates that 93% of the dependent variable is explained, with the remaining 6.5% explained by variables not included in the model.

The Indonesian government has a mission to achieve a golden Indonesia in 2045. Since people are both the agents and the objects of development, the government can raise the standard of human development. The government can create policies to raise HDI by investing in education and providing more adequate and equitable health facilities, based on the findings of this study. The government must lower the unemployment rate by offering training programs, creating jobs, and implementing other measures, as unemployment has a detrimental impact on HDI.

This research still has some limitations. The research focuses only on Java Island, so the results cannot be generalised to other regions with different social, economic, and geographical characteristics. The research data are cross-sectional, so they describe only one specific time: 2023. Therefore, further in-depth study is required to provide more comprehensive research.

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