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Determinants of Human Development in Western Indonesia from Economic, Poverty, and Fiscal Perspectives

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A B S T R A C T

Human development is a critical aspect of regional development, reflecting improvements in health, education, and living standards. In Western Indonesia, disparities in human development are influenced by various factors, including economic growth, education spending, health expenditure, and poverty levels. This study aims to investigate the effects of these factors on human development across provinces in Western Indonesia. Using data from 2017 to 2024, a multiple linear regression model is applied to analyze the relationships between economic growth, education spending, health expenditure, and poverty on human development outcomes. The results suggest that while economic growth and education spending do not significantly impact human development, health expenditure has a positive and significant effect. Additionally, poverty has a significant negative effect on human development. The findings highlight the importance of adequate investment in the health sector and targeted poverty reduction policies to enhance human development outcomes in the region.

1. INTRODUCTION

Human development is the primary goal of every development effort in various countries, including Indonesia. Human development refers to improving individuals' quality of life through improvements in three main dimensions: health, education, and living standards. In western Indonesia, there are significant differences in human development achievements across provinces, influenced by social, economic, and government policy factors. Therefore, it is important to analyze the influence of factors such as **economic growth, education spending, health spending,** and **poverty** on human development in the region.

The Human Development Index (HDI) is not merely a statistical measure, but also a reflection of quality of life that comprehensively touches on social and economic aspects. Empirical research shows that variables such as health expenditure, education expenditure, economic growth, and poverty are significant variables affecting the HDI at both regional and national levels (Singh et al., 2025).

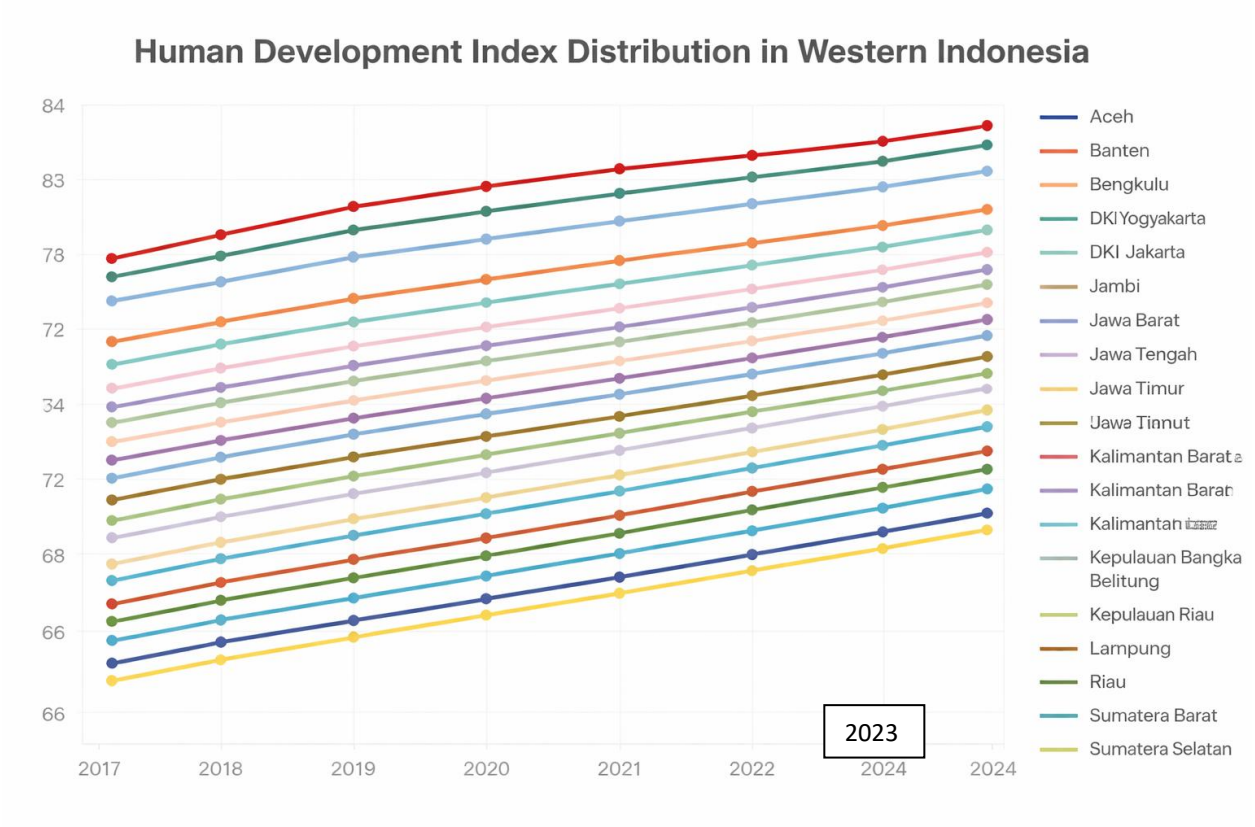
Economic growth is one of the most important indicators in human development because it has the potential to increase people's incomes, create jobs, and improve access to basic services such as education and health. Barro (1996) argues that sustained economic growth can improve people's quality of life and provide greater opportunities for improving social welfare. However, as stated by Ravallion (2001), the impact of economic growth on human development may be limited if income is not distributed evenly, which can result in greater inequality across regions.

Education is one of the main pillars of human development. Quality education can improve people's skills and knowledge, open better job opportunities, and improve overall quality of life. According to Todaro and Smith (2012), education is a long-term investment that has a major influence on improving the quality of human resources, which in turn increases social welfare. Education spending, which includes government budgets for educational infrastructure, teachers' salaries, and the provision of other supporting facilities, plays an important role in providing decent education for the public. In western Indonesia, provinces with higher allocations of education spending, such as DKI Jakarta and DI Yogyakarta, generally show better levels of human development, because higher educational quality drives improvements in individuals' capabilities and productivity.

Health is a crucial aspect of human development. Good health enables individuals to work more productively, participate in social activities, and enjoy longer and higher-quality lives. Bloom, Canning, and Sevilla (2004) explain that adequate spending in the health sector can reduce the burden of disease, increase life expectancy, and improve overall quality of life. In western Indonesia, provinces with larger allocations of health spending, such as DKI Jakarta, tend to have better human development achievements because better quality health services contribute to improvements in public health. Conversely, provinces with lower health spending may face difficulties in providing adequate health services, which negatively affects people's quality of life.

Poverty is a major challenge in human development efforts. Poverty not only affects low income, but also hampers access to basic services such as education and health. Sen (1999) emphasizes that poverty is not only a problem of low income, but also a problem of lack of access to basic needs that are essential for improving quality of life. High poverty is often associated with low-quality education and health, which hinders human development. In western Indonesia, provinces with higher poverty levels, such as Bengkulu and Lampung, often face major obstacles in improving human development. Therefore, poverty alleviation through appropriate social policies is very important to create conditions that support improvements in people's quality of life.

In the graph below, we can see the distribution of HDI in western Indonesia as baseline data to observe how differences in the quality of human development across existing provinces:



The graph "Distribution of HDI in Western Indonesia" shows the movement of the Human Development Index (HDI) from 2017 to 2024 in 17 provinces of western Indonesia. Each province is represented by a line in a different color showing changes in their HDI over time. The graph covers an HDI range between 66 and 84, with provinces such as DKI Jakarta and DI Yogyakarta showing the highest HDI figures, while provinces such as West Kalimantan and Bengkulu have lower HDI figures, although experiencing steady increases.

Overall, this graph illustrates a positive trend in almost all provinces, with most regions showing a consistent increase in the HDI from year to year. Although there are differences among these provinces, it is evident that provinces with high HDI, such as DKI Jakarta, continue to maintain higher figures compared to other provinces. Meanwhile, provinces with lower HDI figures, such as West Kalimantan and Bengkulu, still show progress despite being below the average. This graph provides a clear picture of the differences and progress in human development in Western Indonesia.

In Western Indonesia, disparities in education and health spending among regencies/cities have been shown to affect HDI achievement, as local studies indicate that the allocation of social expenditure plays an important role in improving the education and health dimensions across various provinces (Jubaidah et al., 2019).

Based on the background and the existing data variation conditions, the author formulates the problem in this study by outlining variables that may influence human development in Western Indonesia

1.2 Problem Formulation

1. Economic growth has a significant positive effect on human development in Western Indonesia. The higher the economic growth, the better the quality of life of the community in the region.
2. Education spending contributes positively to human development in Western Indonesia. Increasing the allocation of the education budget will improve the quality of education, which in turn will improve the level of community welfare.
3. Health spending has a positive effect on human development in Western Indonesia. The greater the allocation of health spending, the better the quality of public health, which contributes to improving human development.
4. Poverty has a significant negative effect on human development in Western Indonesia. The higher the poverty rate, the lower the quality of life and welfare of the community in the region.

Problem Formulation

The formulation of the research problem is the extent to which the variables of economic growth, health spending, education spending, and the poverty rate influence the HDI in Western Indonesia. The purpose of this study is to provide empirical evidence of the influence of these variables on the HDI and to provide policy recommendations that can support HDI improvement through simple measurement using the *t* test, *F* test, and the coefficient of determination (R^2).

2. LITERATURE REVIEW

2.1 Theory and Research Variables

Human Development Index (HDI)

The Human Development Index (HDI) is a composite indicator that assesses the quality of human life through the dimensions of education, health, and a decent standard of living (UNDP, 2020). The HDI reflects individuals'

ability to live productive and meaningful lives, not merely income. Sen's (1999) Capability Approach theory emphasizes that human development must enhance individuals' capabilities and opportunities, making the HDI an important benchmark of the effectiveness of social and economic policies.

Economic Growth and Public Expenditure

Economic growth is an important factor in human development, but its impact on the HDI depends on income distribution and equity (Todaro & Smith, 2020; Suryahadi et al., 2009). Health Expenditure and Education Expenditure are government investments in human capital, which improve quality of life, life expectancy, and educational attainment, thereby directly influencing the HDI (Becker, 1993; WHO, 2018; Hanushek & Woessmann, 2015).

Poverty

Poverty limits people's access to education and health services and to a decent standard of living, thereby reducing the HDI (Sen, 1999). Poverty reduction through social programs and appropriate budget allocations is a primary strategy to improve quality of life and the HDI in regions with economic disparities, such as Western Indonesia (Suryahadi et al., 2009; UNDP, 2020).

3. RESEARCH METHODOLOGY

3.1 Type of Research

This study uses a quantitative approach with a multiple linear regression model to analyze the effect of independent variables on the Human Development Index (HDI) in Western Indonesia. This quantitative research type was chosen because the variables used are numerical and the research objective is to measure the quantitative relationship between Economic Growth, Health Expenditure, Education Expenditure, and Poverty with the HDI. This study is descriptive and explanatory, where the descriptive component is used to describe the conditions of the variables, while the explanatory component is used to analyze causal influences among variables (Creswell, 2014).

3.2 Data Sources

The research data use secondary data obtained from:

Statistics Indonesia (BPS) for Western Indonesia, covering regencies/cities in Sumatra, Java, Bali, and West Kalimantan, for HDI indicators, education spending, health spending, and poverty (BPS, 2024).

The Ministry of Finance and the Ministry of Education and Culture, to obtain data on education and health budget allocations per regency/city (BPS, 2024).

Regional Economic Growth Reports, which contain data on GRDP per capita and the economic growth rate of each region (BPS, 2024).

3.3 Data Analysis

Data analysis was conducted using multiple linear regression with the general equation:

$IPMit = \beta 0 + \beta 1\ Economi_{it} + \beta 2\ LnEducation_{it} + \beta 3\ LnHealth_{it} + \beta 4\ LnPoverty + \varepsilon_{it}$

Description:

IPM_{it} = Human Development Index of Province i in year t
$Ekonomi_{it}$ = Economic Growth of province i in year t
$Pendidikan_{it}$ = Education Expenditure of province i in year t
$Kesehatan_{it}$ = Health Expenditure of Province i in year t
$Kemiskinan_{it}$ = Poverty of province i in year t
ε_{it} = error term

Stages of analysis:
t-test: assesses the significance of each independent variable on HDI.
F-test: assesses the significance of the overall regression model.
Coefficient of Determination (R^2): measures the proportion of HDI variation explained by the four independent variables.
The analysis was conducted using statistical software (e.g., SPSS), and interpretation focused on positive/negative effects and significance at the 95% confidence level (Gujarati & Porter, 2009).

IV. RESULTS AND DISCUSSION

t-test

Variable	B (Koefisien)	Beta	t	Sig.
Economic Growth	-0,111	-0,042	-0,533	0,595
Education Expenditure	-59,79	-0,11	-1,03	0,304
Health Expenditure	125,003	0,214	2	0,047
Poverty	-0,358	-0,196	-2,479	0,014

Economic Growth

The t-test results show that **Economic Growth** has a negative coefficient (-0,111) and is not significant (p = 0,595) for HDI in Western Indonesia. This means that, statistically, an increase in the economic growth rate per regency/city does not have a direct impact on improving HDI in this model. This finding is consistent with the literature showing that high economic growth is not always translated into human well-being evenly, especially if income distribution is unequal (Todaro & Smith, 2020).

Theoretically, economic growth is only one factor in human development. The Human Development Theory model emphasizes that economic growth must be accompanied by equitable access to education and health services in order to have a significant impact on HDI (UNDP, 2020). Without social intervention and

budget distribution, economic growth may not affect indicators of people's quality of life.

Several studies show that in regions with high economic disparity, economic growth often fails to improve quality of life for low-income groups (Suryahadi et al., 2009). This may explain why in Western Indonesia, the coefficient of economic growth is not significant for HDI.

In conclusion, economic growth alone is not a guarantee of HDI improvement. Further analysis is needed to explore mediation mechanisms through public spending in the social sector or poverty alleviation programs so that economic growth has a tangible impact on people's quality of life (Sen, 1999).

Education Expenditure

Education Expenditure shows a negative coefficient (-59,790) and is not significant (p = 0,304) for HDI. This means that even though the allocation of the education budget increases, there is no significant evidence that this directly improves HDI in the Western Region. This finding underscores the importance of **educational quality in addition to budget quantity** (Hanushek & Woessmann, 2015).

Previous research shows that increases in education spending do not always align with improvements in learning achievement or education indicators in HDI, if the spending is not used efficiently or is not evenly distributed (UNESCO, 2018). This indicates that the quantitative variable of education spending needs to be combined with quality indicators to improve HDI.

Education Expenditure plays an important role in building human capital, but its effectiveness depends heavily on the distribution of funds, local management capacity, and the quality of teachers and educational facilities (OECD, 2012). In Western Indonesia, disparities among regencies/cities are likely a factor behind the non-significant effect of education spending on HDI.

Thus, to improve HDI through education, policy focus needs to be on improving education quality, equalizing access, and monitoring budget allocation so that large funds truly affect the education dimension in HDI (Hanushek & Woessmann, 2015).

Health Expenditure

Health Expenditure has a positive coefficient (125,003) and is significant (p = 0,047). This means that increasing the allocation of health spending directly improves HDI in Western Indonesia. This finding is in line with research showing that investment in health services improves quality of life and the health component of HDI (WHO, 2018).

From the Human Development perspective, health is a core dimension of HDI because it is directly related to life expectancy and people's ability to participate productively in the economy (UNDP, 2020). Increased Health Expenditure improves access to health facilities, treatment, and nutrition, thereby supporting improvements in HDI.

Several studies in Indonesia show that regions with higher health expenditure allocations have better HDI outcomes, especially in improving

health dimensions such as life expectancy and access to basic services (Suryahadi et al., 2009). Thus, policies to strengthen health spending have tangible effects on human development.

In conclusion, health spending is the most influential variable among the four independent variables in this model. This underscores the importance of adequate budget allocation to the health sector as a primary strategy to improve the HDI (WHO, 2018).

Poverty

Poverty has a negative coefficient (-0.358) and is significant (p = 0.014). This means that the higher the poverty rate, the lower the HDI in Western Indonesia. This result is consistent with research showing that poverty reduces people's access to education and health services (Setiawan & Ariani, 2019).

Poverty limits individuals' ability to access basic services and improve quality of life, thereby directly affecting the education, health, and living standard components of the HDI (Sen, 1999). Therefore, poverty alleviation is an important strategy to improve the HDI.

In Western Indonesia, variation in poverty levels across regencies/cities is quite large, so areas with high poverty tend to have lower HDI than areas with low poverty (Suryahadi et al., 2009). This strengthens the significant negative relationship between poverty and the HDI.

In conclusion, reducing poverty through social programs and appropriate budget allocations is a strategic step to improve the HDI, especially in regions with high economic disparities such as Western Indonesia (UNDP, 2020).

F Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.485.665,05	4	1.121.416,26	3,064	0,018
Residual	56.730.964,73	155	366.006,22	-	-
Total	61.216.629,78	159	-	-	-

The F-test results show that the multiple linear regression model involving **Economic Growth, Health Expenditure, Education Expenditure, and Poverty** as independent variables on the HDI has **F = 3.064 with p = 0.018.** A p-value < 0.05 indicates that the **overall model is significant,** so statistically, at least one independent variable affects the dependent variable, the HDI. This finding is consistent with econometric theory, stating that the F test is used to assess whether the regression model is collectively acceptable (Gujarati & Porter, 2009).

Theoretically, the F test assesses the simultaneous significance of all independent variables in the model. In other words, the F test examines whether variables such as Economic Growth, Health Expenditure, Education Expenditure, and Poverty collectively can explain variation in the HDI in Western Indonesia. A significant F-test result indicates that at least one variable has a real effect on the HDI (Wooldridge, 2013).

A significant F-test result also confirms that the regression model is suitable for prediction and preliminary causal analysis. Although the **R^2 is only 0.073,** meaning the model explains only 7.3% of the variation in the HDI, the significance of the F test indicates that the model still provides statistically useful information. This aligns with Creswell's (2014) view that the F test is used to assess the overall usefulness of a regression model, regardless of the magnitude of the R^2 contribution.

Test of the Coefficient of Determination

R	R^2	Adjusted R^2	Std. Error of Estimate
0,271	0,073	0,049	604,984

R^2 = 0.073 (7.3%) indicates that 7.3% of the variation in the HDI can be explained by the four independent variables. The remainder (92.7%) is explained by other factors not included in the model, such as education quality, income distribution, infrastructure, or socio-cultural factors.

The coefficient of determination (R^2) in this regression model is **0.073** or 7.3%, with **Adjusted R^2 = 0.049.** This figure shows that **only 7.3% of the variation in the Human Development Index (HDI)** in Western Indonesia can be explained by the four independent variables, namely Economic Growth, Health Expenditure, Education Expenditure, and Poverty. The remaining 92.7% is explained by other factors not included in the model, such as education quality, income distribution, infrastructure, and socio-cultural factors (Gujarati & Porter, 2009).

Although the R^2 value is relatively low, this does not mean the regression model is not useful. In many social and economic studies, a low R^2 can still provide important insights, especially when the dependent variable is influenced by many complex factors that are difficult to measure quantitatively. For example, in human development studies, non-economic and cultural factors often influence the HDI, so the R^2 of quantitative models tends to be low (Creswell, 2014; UNDP, 2020).

In conclusion, the coefficient of determination confirms that the regression model makes a limited contribution to variations in the HDI, but it remains useful for identifying the relative and significant effects of the Health Expenditure and Poverty variables. Therefore, the interpretation of R^2 needs to be combined with the t-test and the F-test to obtain a comprehensive understanding of the influence of independent variables on the HDI (Gujarati & Porter, 2009; UNDP, 2020).

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