

Analysis of the Influence of Labor Force Participation, Open Unemployment Rate, Economic Growth and Education Level on the Human Development Index in Malang Regency

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ARTICLE INFO

Keywords: Human Development Index, Labor Force Participation, Open Unemployment Rate, Economic Growth, Education Level

Received : 30, March

Revised : 12, April

Accepted: 14, May

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ABSTRACT

This study aims to analyze the influence of labor force participation, open unemployment rate, economic growth, and education level of the Human Development Index (HDI) in Malang Regency during the 2019-2023 period. Human development is a crucial aspect of regional advancement, with HDI serving as a comprehensive indicator encompassing health, education, and income dimensions. The research adopts a quantitative approach using multiple linear regression analysis. Secondary data obtained from the Central Bureau of Statistics (BPS) of Malang Regency is used to measure the relationship between independent variables Labor Force Participation Rate (LFPR), Open Unemployment Rate (OUR), Economic Growth Rate, and Average Years of Schooling and the dependent variable, HDI. The result indicates that each independent variable has a varying level of influence on HDI, with education and labor force participation showing a more significant impact.

INTRODUCTION

Human Development Index (HDI)

Human development has emerged as a critical focus in evaluating a region's socio-economic progress. The Human Development Index (HDI), developed by the United Nations Development Programme (UNDP), measures a country's achievement in health, education, and standard of living (Efendi et al., 2015). HDI provides a multidimensional framework to assess the quality of life in a region. According to (Todaro, 2011), HDI emphasizes three fundamental aspects of human welfare: life expectancy, education attainment, and income. Migley (1995) stated that well-being is achieved when basic need such as a health, education, and income are met, reflecting a stable and prosperous society. HDI shifts the development discourse from purely economic output to human-centered growth (Sanggalorang et al., 2015).

Labor Force Participation

Labor force participation rate (LFPR) represents the active portion of the population involved in the labor market, either employed or actively seeking employment. Higher participation rates indicate a healthy labor market and greater economic productivity. According to Lewis, the labor force is influenced by population growth, where increasing population often leads to higher labor force numbers (Daud et al., 2022). Moreover, BPS (2023) emphasized that education plays a crucial role in increasing labor force participation by enhancing employability.

Open Unemployment Rate

The open unemployment rate refers to individuals actively seeking employment but unable to find work. Sukirno (2006) noted that unemployment often arises when labor force growth outpaces job availability. Keynesian theory also attributes unemployment to insufficient aggregate demand, recommending fiscal intervention to mitigate this (Ardian et al., 2022). The consequences of unemployment include decreased quality of life, increased poverty, and psychological stress (Mankiw, 2006; Ningrum et al., 2020).

Economic Growth

Economic growth, typically measured by Gross Regional Domestic Product (GDRP), is a key determinant of development. Classical economists such as Adam Smith and David Ricardo argued that growth stems from capital accumulation, labor, and technological advancement (Murni, 2016). The Harrod-Domar model highlights investment's dual role in stimulating both demand and capacity (Arsyad, 2010), while Solow's neoclassical model emphasizes technological innovation as the primary long-term growth driver (Kuncoro, 2010).

Education Level

Education is widely acknowledged as a catalyst for economic and social development. According to human capital theory, education enhances worker productivity and economic output (Todaro, M. P., & Smith, 2000). Neoloka (2017)

emphasized the transformative role of education in developing cognitive, emotional, and social skills, furthermore, higher education correlates with better employment opportunities, increased income, and stronger societal participation, contributing directly to improvements in HDI (Ihsan Fuad, 2005; Nasyri et al., 2024)

Relationship Between Variables and HDI

The interconnectedness of labor participation, unemployment, economic growth, and education with HDI has been widely documented. Labor participation improves income and access to essential services, thereby increasing HDI (Assa Faelassuffa, 2021; Sukirno, 2006). In contrast, high unemployment is associated with reduced public welfare and limited access to healthcare and education (Priambodo, 2021). Economic growth enables increased public investment in human capital development (Dewi et al., 2021), while education strengthens individual capacity and social cohesion (Asmawani, 2021).

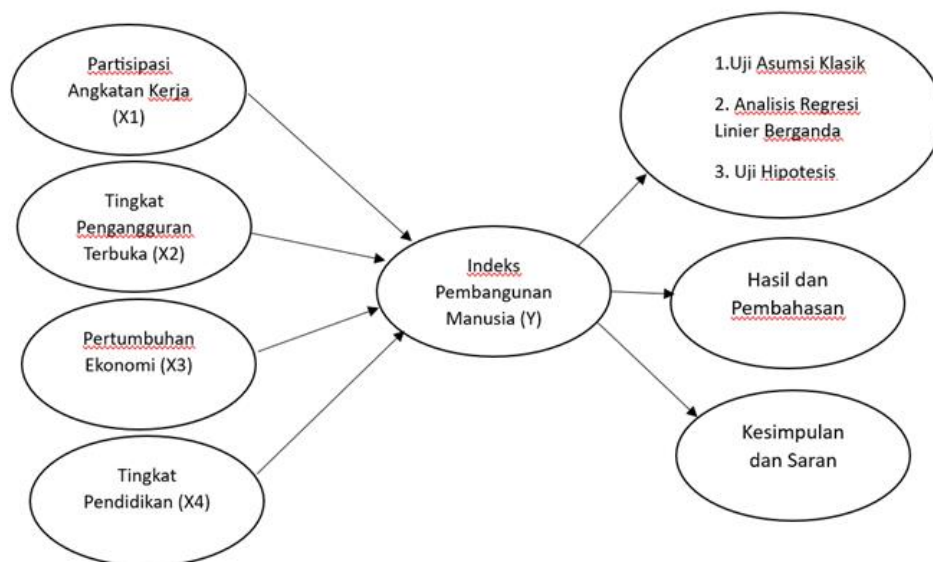


Figure 1. Conceptual Framework

LITERATURE REVIEW

Human Development Index (HDI)

Migley (1995) states that well-being involves meeting basic need-nutrition, health, education, housing boots productivity and development impact. According to Todaro (2011), development should fulfill basic needs, ensure human growth, and provide freedom of choice. HDI reflects these dimensions, making it a vital tool for evaluating both physical and non-physical aspects of development.

Labor Force Participation

According to W. Arthur Lewis, as cited in (Daud et al., (2022), the size of labor force is influenced by the rate of population growth, where an increase in population leads to a rise in the labor force. On the other hand, in terms of Labor Force Participation Rate (LFPR) growth, a high LFPR reflects a high level of labor force participation.

Open Unemployment Rate

Keynesian theory states that “open unemployment is often caused by insufficient aggregate demand in the economy”. Keynes also emphasized the important role of government in increasing aggregate demand through fiscal and monetary policies to reduce the unemployment rate (Ardian et al., 2022).

Economic Growth

According to (Murni, 2006), the Classical Economic Growth Theory is a concept related to economic development influenced by the relationship between technological advancement and population growth. The ideas proposed by Adam Smith, David Ricardo, and Thomas Robert Malthus demonstrate that the figures of the Classical School had a comprehensive perspective on the role of economic activity in the social life of society. Adam Smith argued that the rate of economic growth is influenced by capital accumulation, savings, and investment in a country. David Ricardo believed that the process of economic growth begins with a small population and an abundance of natural resources.

Education Level

Based on human capital theory, education plays a role in promoting economic growth by enhancing the capabilities and efficiency of the workforce. The education sector has the potential to support and strengthen the economy by developing a more effective labor force equipped with better knowledge and skills. Moreover, quality education also contributes to shaping individuals who are prepared for entrepreneurship, producing competent leaders, and providing various economic programs that can improve the quality of life in society (Nasyri et al., 2024).

METHODOLOGY

This study employs a quantitative research approach to examine how labor force participation, open unemployment rate, economic growth, and education level affect the Human Development Index (HDI) in Malang Regency. The analysis utilizes secondary data sourced from the Central Bureau of Statistics (BPS) covering the period 2010 to 2023.

Research Variables

1. Dependent variable:
 - Human Development Index (HDI), An indicator reflecting societal well-being in terms of health, education, and living standards.
2. Independent variable:
 - Labor Force Participation Rate (X1), The percentage of the working-age population engaged in economic activities.
 - Open Unemployment Rate (X@), The percentage of the labor force that is actively seeking work but remains unemployment.
 - Economic Growth (X3), Measured by the annual percentage change in regional gross domestic product (PDRB).
 - Education Level (X4), Measured by the average years of schooling.

Data Collection

The study relies on secondary data retrieved from the official publications of BPS. Additional supporting data is gathered through a literature review including academic journals, book, and government reports.

Data Analysis Technique

To determine the influence of the independent variables on HDI, this study uses the multiple linear regression analysis method with the aid of SPSS software. Prior to conducting regression, the data is tested through a classical assumption test including:

- Normality test (using P-P Plot and Kolmogorov-Smirnov Test).
- Multicollinearity test (using Variance Inflation Factor (VIF) and Tolerance).
- Heteroscedasticity test (using scatterplot method).
- Autocorrelation test (using Durbin-Watson statistic).

Hypothesis Testing

The hypotheses are tested through t-tests and F-tests to assess both individual and simultaneous significance of the independent variables on HDI. The coefficient of determination (R^2) is also used to measure how much of the variation in HDI can be explained by the model.

RESEARCH RESULT

Classical Assumption Test

Autocorrelation Test

According to Ghazali, the autocorrelation test is used to determine whether there is a relationship or dependency between the residuals (prediction errors) within a regression model. One method that can be applied to identify autocorrelation is the Run Test.

Tabel 1. Autocorrelation Test

Autocorrelation Test	
Runs Test	
Pvalue	0,404

Source: Output SPSS

Based on the table above, the results of the autocorrelation test using the Runs Test indicate a P-value of 0,404, which exceeds the 0,05 threshold ($0,404 > 0,05$). This outcome suggest that the regression model is free from autocorrelation issues. Therefore, it can be concluded that the Runs Test confirms the absence of autocorrelation in this model.

Multicollinearity Test

The multicollinearity test aims to detect whether there is a strong correlation among independent variables in a regression model. This issue can affect result interpretation and lead to unstable estimates. A common method to identify multicollinearity is by analyzing Tolerance and Variance Inflation Factor

(VIF), if Tolerance is below 0,1 or VIF exceeds 10, it indicates the presence of multicollinearity.

The result of the multicollinearity test presented in the table below show that all four independent variables used in analyzing the Human Development Index in Malang Regency have VIF values below 10. This indicates that the regression model does not suffer from multicollinearity issues.

Tabel 2. Multicollinearity Test

Multicollinearity Test	
VIF Value	
Partisipasi Angkatan Kerja	1,538
Tingkat Pengangguran Terbuka	1,251
Pertumbuhan Ekonomi	1,424
Tingkat Pendidikan	1,585

Source: Output SPSS

Heteroscedasticity Test

The heteroscedasticity test checks whether there is unequal variance in residual across observations in a regression model. If the model shows no signs of heteroscedasticity, the assumption of homoscedasticity is met. In this study, the Glejser test was used. Heteroscedasticity is not present when the significance value is greater than 0,05.

Tabel 3. Heteroscedasticity Test

Heteroscedasticity Test	
P-value Glejser Test	
X1	0,232
X2	0,976
X3	0,875
X4	0,739

Source: Output SPSS

From the table above, it can be observed that the P-value in this study is higher than the significance level of 0,05. This indicates that the data in this study does not exhibit heteroscedasticity, allowing for the continuation to the next testing phase.

Normality Test

Normality testing is conducted to determine whether the data distribution is suitable for parametric statistical analysis. This test is used to assess whether the observed empirical data aligns a specific theoretical distribution.

Tabel 4. Normality Test

	Unstandardized Residual
N	14
Normal Parameters ^{a,b} Mean	.0000000
Std. Deviation	.32957938

Most Extreme Differences Absolute	.203
Positive	.203
Negative	-.168
Kolmogorov-Smirnov Z	.203
Asymp. Sig. (2-tailed)	.122 ^c

Source: Output SPSS

Referring to the table below, the Asymp. Sig. (2-tailed) value is 0,112, which exceeds the 0,05 threshold. This indicates that the data follows a normal distribution and show no signs of abnormality, as the significance value is greater than 0,05. Based on the results of the classical assumption tests, it can be concluded that the research model does not violate any classical assumptions, allowing the analysis to proceed to the next stage.

Multiple linear regression

Multiple linear regression is a method used to evaluate the relationship and influence of independent variables on a dependent variable. The resulting regression equation serves as a tool to assess the impact of variables such as labor force participation, open unemployment rate, economic growth, and education level on the Human Development Index. The regression results can be summarized as follow.

Tabel 5. Multiple linear regression

Variabel	Unstandardized Coefficients B	Sig
C	19,501	0,002
PAK	0,049	0,475
TPT	-0,072	0,607
PE	-0,058	0,333
TP	6,547	0,000

Source: Output SPSS

Based on the regression output shown in the table below, the multiple linear regression equation can be expressed as follows :

$$Y = 19,501 + 0,049X_1 = 0,072X_2 - 0,058X_3 + 6,547X_4$$

The explanation of the multiple linear regression model presented earlier is a follows:

1. The constant value is 19.501, which indicates that is Labor Force Participation, Open Unemployment Rate, Economic Growth, and Education Level are held constant, the Human Development Index (HDI) would increase by 19.501%.
2. The coefficient for Labor Force Participation is 0.049. This means that a 1% increase in labor force participation leads to a 0.049% increase in the HDI.
3. The coefficient for the Open Unemployment Rate is a -0.072. A 1% increase in the unemployment rate results in a 0.072% decrease in the HDI.
4. The coefficient for Economic Growth is -0.058. this suggests that a 1% increase in economic growth corresponds to a 0.058% decrease in the HDI.

5. The coefficient for Education Level is 6.574. A 1% increase in the education level leads to a 6.574% increase in the HDI.

Hypothesis Testing

Regression Coefficient (R²)

The regression coefficient is used to evaluate how well a model can explain the influence of independent variables on the dependent variable, as indicated by the R-Square value. This value reflects the extent to which the independent variables contribute to explaining the variation in the dependent variable. The coefficient of determination can be interpreted through the R-Square value, as shown below.

Tabel 6. Regression Coefficient

Model	R	R Square	Adjusted R Square
1	,995 ^a	,990	,985

Source: Output SPSS

Referring to the table above, the R Square value is 0.985, indicating that 98,55 of the variaton in the dependent variable, Human Development Index can be exdplained by the independent variables : labor force parcitipation, open unemployment rate, economic growth, and education level. The remaining 1.5% influenced by other factors not included in this research model.

Simultaneous Test (F)

This test determines whether the independent variables collectively have a significant effect on the dependent variable. A regression model is considered valid if the significance level is below 0,05. Indicating a simultaneous impact. If the significance exceeds 0,05, the model is considered invalid.

The decision rules are as follows:

- Accept H0 and reject H1 if the F-statistic is less than f-table value.
- Reject H0 and accept H1 if the F-statistic exceeds the F-table value.
- Accept H0 if the P-value is greater than 0.05.
- Reject H0 if the P-value is less than 0.05.

Tabel 7. Simultaneous Test (F)

Model	Df	F_{hitung}	F_{tabel}	Sig.
Regression	4	215.157	3,63	0,000
Residual	9			

Source: Output SPSS

Referring to the table presented, the figure displays the F-distribution curve used in hypothesis testing. The calculated F-value of 215.157 lies far to the right of the F-table value of 3.63, indicating it falls within the rejection region of H0. Therefore, H0 is rejected and H1 is accepted, meaning the independent variables have a significant simultaneous effect on a the dependent variable.

Partial Test (t)

This test is used to determine the extent to which each independent variable directly influences the dependent variable. In this analysis, the significance level server as a reference for assessing the relationship between the variables. If the probability value (Sig) is greater than 0,05, the independent variable is considered to have no significant effect on the dependent variable. Conversely, if the Sig value is below 0,05, it indicates a significant effect. The result of the t-test were analyzed using SPSS 25 to ensure more accurate conclusions.

Tabel 8. Partial Test (t)

Variabel	t	Sig
C	4,460	0,002
PAK	0,746	0,475
TPT	-0,533	0,607
PE	-1,023	0,333
TP	22,644	0,000

Source: Output SPSS

The table shows that the t-test decision is based on comparing the t-statistic with the t-table value. Using the formula $df = n - k$ and a 0,05-significance level, the t-table value is 2.262.

a. The partial effect of labor force participation on HDI

The t-test result shows a t-value of 0.746 with a significance level of 0.475. Since the t-value is below the t-table ($0.746 < 2.262$) and the p-value exceeds 0.05, it can be concluded that labor force participation does not have a significant effect on the human development index in Malang Regency.

b. The parial effect of the open unemployment rate on HDI

Based on the t-test result, the calculated t-value is -0.533 with a significance level of 0.607, while the t-table value is 2.262. since the t-value is less than the t-table ($-0.533 < 2.262$) and the significance level is greater than 0.05 ($0.607 > 0.05$), it indicates that the open unemployment rate does not have a significant effect on the human development index in Malang Regency.

c. The partial effect of economic growth on HDI

The t-test result show a t-value of -1.023 with a significance level of 0.333, while the t-table value is 2.262. since the t-value is lower than the t-table ($-1.023 < 2.262$) and the p-value exceeds 0.05, it indicates that economic growth does not have a significant effect on the human development index in Malang Regency.

d. The partial effect of education level on HDI

Based on the t-test, the calculated t-value is 22.644 with a significance level of 0.000. since the t-value is greater than the t-table ($22.644 > 2.262$) and the p-value is below 0.05, it can be concluded that education level has a significant effect on the human development index in Malang Regency.

DISCUSSION

The Influence of Labor Force Participation on the Human Development Index

The partial test results indicate that labor force participation (LFP) does not have a significant impact on the Human Development Index (HDI) in Malang Regency. This suggests that an increase in LFP does not necessarily lead to improvement in HDI within the scope of this study.

This finding contrasts with Sukirno (2006) theory, which states that labor participation reflects available job opportunities and contributes to social welfare. However, between 2010 and 2023, although LFP fluctuated, HDI continued to increase steadily. This may be due to many working-age individuals opting to continue their education rather than entering the workforce. Additionally, many workers are engaged in jobs that only meet basic needs, without improving their overall living standards. Limited job availability and wage levels that do not match living cost also reduce the quality of life, which ultimately affect human development. These results align with (Cahyanti et al., 2021), who found that LFP does not significantly affect HDI, due to limited job opportunities and a mismatch between high education levels and available employment.

The Influence of Open Unemployment Rate on the Human Development Index

The result shows that the open unemployment rate (OUR), when analyzed independently, does not have a significant relationship with HDI in Malang Regency during the period 2010-2023. Although high unemployment typically reduces community welfare and may lower HDI, this was not the case in this study. Contrary to Mankiw's (2006) theory which suggests that unemployment reduces well being and income, thereby lowering HDI, HDI in Malang continued to rise annually and ranked seventh among districts in East Java, despite a high unemployment rate.

This condition is largely due to the growing labor force not being matched by job opportunities, along with skill mismatches and limited employment options. These factors hinder income generation, increasing unemployment levels. Additionally, temporary government programs like the social safety net (JPS) have not provided long term solutions. More sustainable policies are needed to reduce unemployment and improve income distribution to boost HDI. These findings are consistent with (Maulana et al., 2022), who found that the effect of the open unemployment rate on HDI was statistically insignificant or minimal in similar regional studies.

The Influence of Economic Growth on the Human Development Index

Based on the analysis, economic growth did not have a significant impact on the human development index (HDI) in Malang Regency during 2010-2023. This suggests that economic growth in the region does not directly influence improvements in human development. This finding does not fully align with the Neoclassical theory, which argues that stable economic growth increases per capita income and promotes better access to education, healthcare, and living standards. In Malang, however, economic growth was unstable and fluctuated, limiting its positive impact on HDI. Instability in the economy led to declining

average incomes, which hindered overall welfare improvement. Despite this, HDI in Malang Regency continued to rise yearly. One major reason for the lack of significant impact is the uneven distribution of economic growth. In addition, negative growth in certain sectors also contributed to the weak connection between economic growth and HDI.

This situation reflects that economic growth in Malang has not been directed toward enhancing quality of life. More targeted investment in education, healthcare, and welfare is needed for economic growth to translate into human development benefits for all. These findings are consistent with a study by (Maulana et al., 2022), which found that economic growth did not significantly influence HDI in Central Java Province. There, growth in some regions was driven by leading sectors, while others faced stagnation, resulting in uneven development and minimal impact on human development overall.

The Influence of Education Level on the Human Development Index

Education plays a vital role in human development by equipping individuals with the knowledge and skill needed improve their quality of life. In this study, the average years of school in Malang Regency was used as an indicator of education level.

The results show that education level significantly influences HDI in Malang. This indicates a direct positive relationship improvement in education lead to increases in HDI. The findings support the hypothesis that education has a significant positive effect on human development. This aligns with Human Capital Theory (Nasyri et al., 2024), which states that education enhances skills and labor productivity, contributing to economic growth. Higher education levels result in better human quality and strengthen the competitiveness of the workforce, thus improving HDI. Between 2010 and 2023, rising education levels in Malang Regency have contributed to improved human resources, better living standards, and overall community welfare. Education empowers individuals with the capabilities to engage meaningfully in social and economic life.

These findings also reflect the efforts of local governments and stakeholders to expand access to and improve the quality of education. This commitment supports regional development and social progress.

The results are consistent with (Asmawani, 2021), whose study in North Sumatra Province found that education significantly impacts HDI, especially when higher graduation rates are accompanied by improved educational quality.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

This study analyzed the influence of labor force participation, open unemployment rate, economic growth, and education level on the human development index (HDI) in Malang Regency for the period 2010-2023. Based on the results of multiple linear regression analysis and hypothesis testing, the following conclusions can be drawn:

1. Labor Force Participation

Does not have a significant effect on HDI in Malang Regency. Despite an increase in the labor force, the rise in HDI was not directly influenced, which

may be due to the type of employment being dominated by basic survival-oriented jobs or limited opportunities aligned with individuals' skills.

2. Open Unemployment Rate

Also shows no significant impact on HDI. While high unemployment rates generally reduce welfare and development indicators, HDI in Malang continued to increase, possibly due to other compensating factors such as improvements in education or healthcare.

3. Economic Growth

Did not significantly affect HDI. The fluctuating nature of Malang's economy and unequal distribution of growth may explain the lack of direct influence, indicating that growth alone, without inclusiveness and stability, is insufficient to boost HDI.

4. Education Level

Is the only variable found to have a significant and positive effect on HDI. This highlights the essential role of education in improving the quality of human resources and enhancing individual well being, ultimately contributing to higher human development outcomes.

Recommendations

Based on the findings, several recommendations are proposed:

1. Promote inclusive employment, local governments should create quality jobs that match the population's skills and education to support decent work and sustainable livelihoods.
2. Enhance skills training, vocational and workforce development programs should be expanded, especially by investing in both productive sectors and essential services like health and education.
3. Support equitable economic growth, economic policies should ensure that growth benefits all communities by investing in both productive sectors and essential services like health and education.
4. Improve education access and quality, continued investment in education especially in underserved areas is crucial to improving human development.
5. Encourage policy integration, collaboration between government, private sector, and academia is needed to align employment, education, and welfare policies for lasting HDI improvement.

ADVANCED RESEARCH

For future research, it is recommended to consider additional relevant variables, and use more diverse research methods to obtain a more comprehensive understanding. Research can also be focused specifically on certain areas to get a more in-depth picture.

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