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Economic Growth And Human Development In Indonesia

Original Article

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Abstract

The need for a good understanding of economic growth and human capital as a measure of human development is an important concern in national development. Both sectors play an important role in formulating economic development policies and human development as a whole, as evidenced by Indonesia. Therefore, this article empirically analyzes the contribution of economic growth to the human development index in Indonesia. Linear regression analysis of panel data through the Redundant Fixed Effect Model Test approach and the Hausman Test is used to test the extent to which the panel data estimation model can explain the effect of economic growth on human development in Indonesia. These two approaches produce a Fixed Effect Model that shows that the effect of economic growth contributes strongly to human development in Indonesia. Economic growth has a positive and significant impact on the Human Development Index. During the testing period, economic growth showed an increase and a positive direction towards human development, even though the economy was in a state of the COVID-19 pandemic. The Indonesian economy continues to grow strongly in the face of various conditions, including the Covid-19 pandemic, as well as human development continues to show an increase, as evidenced by the human development index, which continues to increase.

Keywords: Economic Growth, Human Development, Panel Data

1. Introduction

Human capital is a form of investment like machines and technology, which includes knowledge, skills, health, and individual attitudes. Humans play an important role in economic activities such as production, consumption, and transactions. (Schultz, 1961). Romer, (1989) and Rosen, (1999)) emphasize that human capital is the main source of productivity and is the result of individual investment. Todaro (2000) and Frank & Bernanke (2007) added that education and health are the main indicators in measuring human capital. Rastogi (2002) also stated that competence, attitude, and health are important elements. The higher the level of education and training, the higher the skills possessed. However, productivity will not be maximized without good health, because education and health influence each other.

The COVID-19 pandemic has impacted the health sector and many other economic sectors. It has caused resource shortages, chaos, uncertainty, loss of life, socio-economic crisis, idle consumption, and unemployment (Song et al., 2021). The COVID-19 pandemic has caused one of the most challenging problems worldwide in the 21st century (Szczygielski et al., 2022). The stronger impact on macroeconomic variables, rising raw material prices, declining

economic activity among trading partners, declining demand for tourism services, slowing down of global value chains, and financial risk aversion (Ivan et al., 2023).

The human component in sustainable development plays a major role. (Duran et al., 2015). The high quality of the workforce through increasing knowledge and mastery of a country's technology can increase productivity. Factors such as education and technological progress have a positive correlation with economic growth. (Upreti, 2015). On the other hand, low human resource development is believed to be one of the main causes of the resource curse in developing countries rich in natural resources. (Butkiewicz & Yanikkaya, 2010). However, this resource curse can be turned into a blessing through investment in human resources, because human resource development can stimulate economic growth.

Territorial competition tends to widen the gap between regions because access to resources is highly dependent on the information and capacity that each region already has. (O'Brien & Pike, 2015). The presence of skilled individuals alone is not enough to drive growth and competitiveness; it needs to be combined with an entrepreneurial culture to be utilized effectively. (Obschonka et al., 2015). The development of networks and innovative cultures takes time through various supporting mechanisms.

The Human Development Index (HDI) in 2023 nationally increased compared to 2022 and has been high or above 70 percent since 2016, and continues to increase. Indonesia's HDI is at 74.39, up 0.84 percent compared to 2022. All dimensions that form the HDI have increased, especially decent living standards and knowledge. In the dimension of longevity and healthy living, babies born in 2023 have a life expectancy of 73.93 years, an increase of 0.23 years compared to those born in 2022. Indonesia's Human Development Index (HDI) in 2023 showed a significant increase compared to 2022, reaching 74.39 or an increase of 0.84 percent. Since 2016, the national HDI has been in the high category (above 70) and continues to experience a positive trend.

All main components of the HDI, namely health, education, and decent living standards, have progressed. In terms of health, babies born in 2023 have a life expectancy of 73.93 years, up 0.23 years from the previous year. In the field of education, the expected length of schooling (HLS) for children aged 7 years increased to 13.15 years, while the average length of schooling (RLS) for people aged 25 years and over increased to 8.77 years. Meanwhile, in terms of living standards, the average real expenditure per capita per year increased by IDR 420 thousand or 3.66 percent compared to 2022.

In 2023, DKI Jakarta recorded the highest HDI nationally with a value of 83.55, followed by DI Yogyakarta, which is also in the very high human development category (above 80). Overall, there are 14 provinces with HDI above the national average. Meanwhile, Papua is the province with the lowest HDI, at 63.01, and is included in the moderate category along with three other provinces. Currently, there are no more provinces in Indonesia that are included in the low human development category.

The quality of Indonesia's Human Resources (HR) is still not optimal, as reflected in the Human Capital Index (HCI) ranking in 2022, which is in 96th position out of 174 countries, and the Human Development Index (HDI) in 2023, which is in 114th position out of 189 countries. To face the demographic bonus and global disruption, the government has designed a long-term strategy through investment in education, skills training, health, and innovation infrastructure. According to Doré & Teixeira, (2023) Education has a long-term positive impact on economic growth. In developing countries, the transition to a more modern manufacturing sector is considered more effective in driving growth than institutional quality.

High dependence on natural resources can hinder economic growth. On the contrary, strengthening human resources, the financial sector, industrialization, technological

innovation, and involvement in international trade are key factors in driving growth. The combination of natural and human resources has a positive impact if managed in a balanced way. Without human resource development, the use of natural resources tends to be less than optimal and risks slowing down development. Therefore, optimization of natural potential must be accompanied by increasing human capacity through technology and cultural transformation to drive sustainable economic growth. (Saleh et al., 2020).

The study of human resource (HR) development is very relevant for developing countries that generally face challenges such as poverty, inequality, manufacturing sector inefficiency, corruption, and political instability ((Amar & Pratama, 2020; Ribeiro & Wang, 2020a). Human capital includes knowledge, skills, ideas, abilities, and health that play an important role in driving economic productivity. Improving these aspects can strengthen innovation, flexibility, and productivity to support sustainable economic growth (Dankyi et al., 2022). Therefore, investment in HR development should be a priority compared to other expenditures, because it provides long-term economic benefits, unlike the primary production sector, which does not require a lot of skilled labor (Abata et al., 2012; Tambunan, 2017)

This study examines the extent to which economic growth contributes to human capital as a benchmark for improving the human development index in Indonesia between 2014 - 2023. By using panel data linear regression analysis with two approaches, namely the redundant fixed effect model test and the Hausman test, economic growth is expected to be able to increase the human development index by considering the level of health, sustainable education, and increasing per capita income in Indonesia.

2. Literature Review

2.1. Economic Growth: The Macroeconomic Pillar of Development

Economic growth is often measured through the Gross Domestic Product (GDP) indicator, which reflects the increase in the production capacity of goods and services in a country. (Todaro & Smith, 2006). In Indonesia, the trend of economic growth in the last two decades has shown quite good macroeconomic stability, although it is vulnerable to external shocks such as the global crisis. According to the World Bank (2022), Indonesia experienced an average growth of 5% per year before the COVID-19 pandemic. However, this growth has not been fully inclusive. The informal sector still dominates employment, and regional disparities are still high, especially between western and eastern Indonesia. (Amar & Pratama, 2020)

2.2. Human Development: Structural Indices and Challenges

Human development refers to the process of expanding basic human choices, including education, health, and a decent standard of living. The Human Development Index (HDI) used by UNDP covers three main dimensions: a long and healthy life, access to knowledge, and a decent standard of living. (UNDP, 2023) Indonesia recorded an increase in its HDI score from 66.53 in 2010 to 72.91 in 2022 (BPS., 2023). However, disparities in the quality of education and health between regions and between cities and villages remain obstacles. Ribeiro & Wang, (2020) Emphasized that Indonesia's inefficient manufacturing base also limits the competitiveness of its workforce and optimal accumulation of human capital.

2.3. The Relationship between Economic Growth and Human Development

Several studies have shown a reciprocal relationship between economic growth and human development. Economic growth provides fiscal space for the government to increase investment in the education and health sectors. (Barro & Sala-i-Martin, 2004). Conversely, improving the quality of human resources can boost productivity and strengthen the long-term economic base. (Becker, 1993) In the Indonesian context, an empirical analysis conducted by Nugroho et al. (2019) shows that increasing the education and health budgets significantly contributes to GDP per capita growth, but the effects vary across provinces. This emphasizes the need for a contextual and micro-data-based development approach.

3. Methods

This study uses a quantitative approach using secondary data that is already available and published by the Central Statistics Agency in the period 2014 - 2023. Panel data linear regression analysis is used to determine the extent to which economic growth contributes to human capital in increasing the human development index sustainably in Indonesia. The panel data used are 34 provincial areas as cross-section data and time series data for 10 periods annually.

The use of panel data can increase the number of observations and therefore more degrees of freedom in the estimation, and can contribute to reducing collinearity between explanatory variables and allow for more extensive testing of competing model specifications. Correlations between explanatory variables in a regression equation are often stronger over time than between individuals. The combination of cross-sectional and time series data can improve the quality and quantity of the data and allow us to see dynamic relationships in ways that would not be possible using either of them alone (Wooldridge, 2010; Gujarati, 2012; and Biorn, 2017). Panel datasets also allow us to control for unobserved cross-sectional heterogeneity.

In this study, there are three estimation approach models commonly used in panel data linear regression analysis, namely the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM). Each estimation has its model; the Chow Test is conducted to compare the Common Effect Model with the Fixed Effect Model. The Hausman Test is conducted to compare the Random Effect Model with the Fixed Effect Model. The Lagrange Multiplier Test is conducted to compare the Common Effect Model with the Random Effect Model. (Biørn, 2017a; Gujarati & Porter, 2012). The decision on the best model is taken according to the predetermined criteria. A good Research Model is required to meet the characteristics set out in an econometric model (the goodness of an econometric model). Regression models are often used in panel data analysis, Biørn, (2017) Panel data regression analysis can handle unsolved problems when only standard unidimensional data is available. In this study, the estimation model used is the Fixed Effect Model according to the Chow Test and Hausman Test criteria.

4. Results and Discussion

Based on the results of statistical calculations using a simple linear regression method that produces an estimate of the Fixed Effect Model shows that economic growth has a positive and significant effect on the human development index in Indonesia. Interpreted in the language of economics, the positive meaning gives the meaning that an increase in economic growth is also followed by an increase in the human development index. While the significant meaning means that economic growth can be convincingly and meaningfully proven to affect the human development index. The level of significance is expressed in numbers that indicate the possibility or risk of error in the test carried out, where in this study, the number 5 percent or α = 0.05 is used. Interpretation of panel data regression test results using the Fixed Effect Model. Through simple linear regression of panel data that shows the causal relationship between independent variables and dependent variables is as follows:

$$\text{Equality: } \ln z_1 = \beta_0 + \beta_1 \ln y + \varepsilon$$

Where:

$z1$ = Human Development Index
$\beta 0$ = Constants
$\beta 1$ = Regression coefficient of independent variables
y = Economic growth
ε = Epsilon (Other factors outside the model)

The results of the linear regression analysis of the Fixed Effect Model panel data with the equation, namely:

$$z_1 = 3{,}089 + 0{,}023\, y$$

The regression coefficient β1 of 0.023 indicates that economic growth has an inelastic effect on the Human Development Index (HDI), meaning its influence is relatively small. A t-statistic of 12.068 (greater than the critical value of 1.658) and a p-value of 0.000 (below the 0.05 threshold) confirm that the effect is positive and statistically significant. Thus, economic growth significantly contributes to improving HDI in Indonesia. The Human Development Index (HDI) reflects development quality through life expectancy, education, and standard of living. It is used to assess a country's development level and classify its progress. In Indonesia, HDI serves as a key indicator for evaluating the effectiveness of economic policies in improving the quality of life. A higher HDI indicates better human development, while annual changes reflect the pace of improvement over time.

In 2023, Indonesia's Human Development Index (HDI) reached 74.39, an increase of 0.62 points from 73.77 in 2022. Improvements occurred across all dimensions: longevity and health, education, and standard of living. Life expectancy at birth rose to 73.93 years, up by 0.23 years. The expected years of schooling increased slightly from 13.10 to 13.15 years, while the average years of schooling for those aged 25 and above rose from 8.69 to 8.77 years. The adjusted per capita expenditure also grew by IDR 420,000 (3.66%) compared to the previous year.

Between 2020 and 2023, Indonesia's HDI grew at an average annual rate of 0.72%. West Kalimantan advanced from a medium to a high human development status. DKI Jakarta recorded the highest HDI in 2023 at 83.55, followed by Yogyakarta, which also achieved a very high HDI (above 80.00). In total, 14 provinces surpassed the national HDI average. Papua had the lowest HDI at 63.01, placing it along with three other provinces in the medium

development category. As of 2023, no province in Indonesia remains in the low human development category.

Economic growth can raise household income, improving access to healthcare and nutritious food. Higher income also enables individuals to invest in health services, such as vaccinations and regular check-ups. Health infrastructure development—such as hospitals and clinics—is a key aspect of economic progress. Empirical evidence shows a strong correlation between good public health and higher economic growth. Better health boosts productivity by extending the working life and reducing absenteeism (Atun et al., 2025). An often overlooked mechanism is the broader economic impact of health investments through both supply and demand channels. Crawshaw (2024) found that health status significantly affects an individual's ability to engage in paid work, with poor health often leading to labor market exclusion. Economic inactivity is closely linked to poor health outcomes. Fumagalli et al. (2024) advocate for policy approaches that integrate health into economic strategies and stress cross-sector collaboration to optimize the economic benefits of improved health outcomes.

He second dimension of the Human Development Index (HDI) is education, measured by expected years of schooling and mean years of schooling. The former reflects the average number of years a child is expected to attend school, while the latter indicates the average years of education completed by adults. Higher education levels correspond to improved human capital quality. Correa & Esquivias, (2025) Emphasize that investing in digital and educational infrastructure enhances human capital, competitiveness, and productivity—key drivers of sustainable economic growth. Jin & Kim confirm that education significantly influences economic development. While Odhiambo finds education's overall impact on growth to be limited, secondary education consistently shows a positive and unconditional effect.

Indonesia continues to face significant challenges in achieving equitable education, particularly in remote and underdeveloped areas. Limited access, uneven teacher quality, and curricula that lack relevance to current needs remain key issues. Infrastructure in 3T regions (frontier, outermost, and disadvantaged), including classrooms, sanitation, and teacher availability, is still inadequate. For 2023, the government allocated IDR 608.3 trillion for education, reflecting a commitment of 20% of national spending. However, only IDR 513.38 trillion was realized, amounting to just 16.45% of total expenditure. According to the 2022 PISA rankings released in December 2023, Indonesia ranked 68th in education quality. To ensure inclusive benefits from government initiatives, programs like the Higher Education Affirmation (ADIK) and Indonesian Education Scholarships (BPI) must be further optimized to improve both access and quality across all segments of the population.

Human development is closely linked to improving individual well-being and, more importantly, creating an environment that enables people to live meaningful lives, thereby reflecting human dignity. (Holik et al., 2017) Humans are the central factor in the production process; natural resources alone hold little value without human intervention to transform inputs into outputs. (Egert et al., 2020) Emphasize that greater participation in early childhood education, increased autonomy for schools and universities, lower student-teacher ratios, a higher entry age for lower secondary education, and fewer financial barriers in higher education all contribute to strengthening human capital. These factors enhance the positive impact of increased public spending on education.

The third dimension of the Human Development Index (HDI) is income per capita, which represents the average income per person in a specific region. It serves as a key indicator in calculating per capita expenditure, one of the components used in HDI measurement.

Income per capita is closely linked to economic growth—higher average income generally indicates positive economic progress. As income per capita increases, so does the purchasing power of the population, which in turn stimulates further economic development. In 2024, Indonesia's income per capita reached IDR 78.62 million, or approximately USD 4,960.33. This marked an increase from the 2023 figure of USD 4,919.70 or IDR 75 million, reflecting a growth of around IDR 3.6 million. Despite this upward trend, millions of Indonesians still live in extreme poverty, with daily expenditures below IDR 10,739.

Indonesia's economic growth in 2024 reached only 5.03%, slightly lower than the 5.05% in 2023 and below the 5.2% target set in the 2024 state budget. According to the International Monetary Fund (IMF), Indonesia ranked 118th in GDP per capita with USD 5,250. This lags far behind Singapore (4th, USD 93,960) and Malaysia (72nd, USD 14,420), but remains ahead of Vietnam (119th, USD 4,990) and India (38th, USD 2,940). Empirical research shows that investing in human capital, through improved knowledge, skills, health, and resilience, boosts productivity, adaptability, and innovation for sustainable economic growth (Dankyi et al., 2022). Such investment should be prioritized over other expenditures. Local behavioral dynamics influence competitiveness and should be integrated into holistic public policy strategies (Huggins & Thompson, 2023). Long-term, education significantly impacts economic growth. An overreliance on natural resources without human capital development hinders growth (Saleh et al., 2020).

A study by Krueger & Lindahl, (2001) Found that human capital has a more positive impact on economic growth in countries with lower levels of economic development and human capital. Qadri & Waheed, (2013) Also observed that returns on human capital investment tend to be higher in low-income countries. Vandenbussche et al., (2006) Linked this to the technological frontier, suggesting that the wealthier a country is, the lower its catch-up potential. Similarly, Bove & Elia, (2017) Argued that economic development can benefit from cultural diversity in much the same way as it does from human capital.

5. Conclusion

Economic growth has a positive impact on human development in Indonesia. During the COVID-19 pandemic, the country’s economic growth declined sharply from 5.00 percent in 2019 to -2.07 percent in 2020. However, it rebounded steadily, reaching 5.05 percent in 2023. The Human Development Index (HDI) also rose from 71.92 in 2019 to 72.81 in 2020, and further increased to 74.39 in 2023. Human capital plays a vital role in the production process—natural resources alone are not productive without human effort to transform them into output. The first dimension of the HDI is health, measured by life expectancy and overall well-being. In 2023, there was a strong and reciprocal relationship between the health status of the population and economic growth in Indonesia. Good health boosts labor productivity, which supports economic output, while sustained economic growth enhances access to healthcare services and quality of life.

One of the most urgent health issues is stunting due to malnutrition. Stunting prevalence dropped significantly from 37 percent in 2013 to 21.5 percent in 2023, although it remains high compared to the ideal target of 14 percent. Addressing stunting requires integrated, cross-sectoral efforts. To improve health outcomes, the government must invest in health infrastructure and facilities, ensuring, for example, that every community health center (Puskesmas) is equipped with diagnostic tools such as ultrasound (USG) and electrocardiogram (EKG) machines.

The second dimension of the Human Development Index (HDI) is the development of the education sector. However, this sector continues to face significant challenges, particularly in

terms of equitable access and quality. Limited access in remote areas, uneven distribution of qualified teachers, and a curriculum that is not yet fully aligned with current needs are among the key issues. Additionally, the availability and condition of school infrastructure—such as classrooms, sanitation facilities, and teachers in the 3T regions (frontier, outermost, and underdeveloped)—remain inadequate. Comprehensive and sustained efforts are required to enhance both the quality and accessibility of education in order to strengthen this HDI dimension.

The third dimension is income per capita, which refers to the average income earned by individuals in a specific area. This serves as a key indicator in calculating per capita expenditure used in the HDI. In 2024, Indonesia's income per capita reached IDR 78.62 million or approximately USD 4,960.33. This reflects an increase from 2023, which stood at USD 4,919.7 or about IDR 75 million, indicating a rise of around IDR 3.6 million in per capita GDP. Nevertheless, this economic improvement has not yet translated into equitable welfare gains, as millions of Indonesians still live in extreme poverty, with daily expenditures below IDR 10,739.

This study aims to analyze the influence of economic growth on human development in Indonesia. The data sample was drawn from the provincial level; thus, the findings may not fully reflect the national condition, especially if observations at the regency or city level are included. Consequently, the generalizability of the results should be approached with caution. Furthermore, this research operates under the assumption of ceteris paribus—that all other variables remain constant—while in reality, various external factors simultaneously affect the dynamics between economic growth and human development. It is important to note that finding a correlation between two variables does not automatically imply causation.

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