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THE EFFECT OF HUMAN CAPITAL ON ECONOMIC GROWTH BEFORE AND AFTER THE COVID-19 PANDEMIC

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Abstract

According to endogenous theory, human capital plays a role in determining economic growth. This research was conducted because there is a phenomenon of imbalance between economic growth and the development of the quality of human resources that occurs in a region. The purpose of this study is to determine how much influence the composite indicators of the human development index and the labor force as human capital have on economic growth and to determine whether there is a significant difference between the average length of schooling and per capita expenditure before and after the COVID-19 pandemic. This research is a quantitative type conducted on districts/cities in the former Kedu Prefecture of Central Java Province in the period 2017 to 2023. The secondary data used comes from the Provincial Statistics Agency and districts/cities. The research method used is panel data regression analysis and Eviews 10 software. Based on the research results and data analysis, it shows that: (1) Average length of schooling and labor force have a positive and significant effect on economic growth (2) Life expectancy, per capita expenditure, and investment have no significant effect on economic growth (3) Average length of schooling and per capita expenditure have no significant difference before and after the COVID-19 pandemic. Local governments are expected to prioritize increasing the accessibility and quality of education to encourage skills training programs according to market needs and the leading sectors of each region.

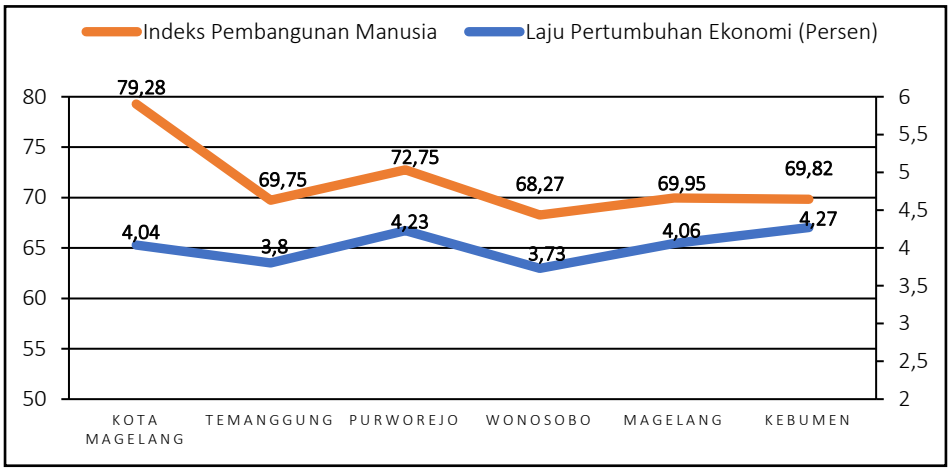
Keywords: Average Length of Schooling, Life Expectancy, Expenditure per Capita, Labor Force, Investment, Economic Growth.

INTRODUCTION

Economic growth is the main benchmark in assessing the level of development achievements in a region. Economic growth is a dynamic process that describes the continuous transformation in a country's economy with the aim of realizing a better situation within a certain period of time (Sukirno, 2017). According to Mankiw (2016), economic growth refers to the development of a country's potential to create goods and provide services in the long term. It also reflects the extent to which ongoing economic activity can encourage an increase in people's income in a certain period of time. so that it is closely related to improving people's welfare (Romi & Umiyati, 2018).

Central Java Province ranked third as the region with the highest economic growth rate in Java in 2023. The economy in Central Java Province grew positively by 4.98% on a Year on Year (YoY) basis, slowing down compared to the achievement in 2022 which grew by 5.31% YoY (BPS, 2024). Based on the Central Java Governor's Accountability Statement Report (LKPJ), this decline was caused by prolonged global geopolitical conflicts and the elnino phenomenon which caused a reduction in agricultural commodity production. Administratively, Central Java consists of 35 regencies/municipalities that are divided into 6 areas. Specifically, the division of the 6 residency areas of Central Java consists of the Kedu, Banayumas, Pati, Pekalongan, Semarang, and Surakarta Karesidenan (Indraswari & Rudatin, 2022).

According to data recorded at the Central Bureau of Statistics, the former Kedu Prefecture is the region that contributed the least to the economic growth of Central Java Province, which amounted to 9.5%. The region includes Magelang City, Purworejo Regency, Wonosobo Regency, Temanggung Regency, Kebumen Regency, and Magelang Regency. This indicates that local governments still need to make improvements in various aspects to encourage regional economic growth. A positive growth rate will result in an increase in per capita income and the welfare of the community (Basoan, 2019). Community welfare will have an impact on improving the quality of human resources. The quality of human resources in a country can be seen from the Human Development Index (HDI) (Muhamad & Rahmi, 2023). Referring to the HDI and economic growth of the former Kedu Prefecture area in the period 2017 to 2023 in Figure 1. shows significant variations.



Source: BPS Central Java (processed)

Figure 1. Comparison of Economic Growth Rate and HDI in the former Kedu Prefecture area in 2017-2023.

In its development, the economic growth of districts and cities in the former Kedu Prefecture area has fluctuated, while the HDI has increased. Figure 1 shows that Magelang City has the highest average HDI value among all regions compared. However, its average economic growth rate is relatively slower than that of Purworejo and Magelang districts. Data from the Central Bureau of Statistics in 2020 shows that Magelang City is the city that experienced the sharpest decline, which was -2.45% in the former Kedu Prefecture area. This was influenced by restrictions on mobility and activities during the Coronavirus Disease 2019 (COVID-19) pandemic (Aeni, 2021).

The COVID-19 pandemic forced many businesses to reduce production and the number of workers to survive, leading to rising unemployment and declining purchasing power (Syahrial, 2020). Many workers lost their income, even completely, and were forced to reduce their consumption of goods and services. The impact extended to various sectors, including the economy, health, and especially education, which experienced significant changes (Tuwu, 2020). The 2021 National Economic Survey (SUSENAS) showed that 76% of families reported their children dropping out of school during the pandemic, mainly for economic reasons. As many as 67% of families could not afford school fees, and 8.7% of children were forced to work to help the family. In addition, online learning due to social distancing policies has worsened the education situation (Cerelia et al., 2021). These conditions indicate the risk of a decline in the quality of human resources due to the pandemic.

Endogenous growth theory reveals that long-term economic growth is influenced by investment in physical capital and human capital. Human capital relates to the quality of human resources that focuses on individual knowledge and skills to increase economic productivity (Suhendra, 2020). The main components that determine human capital include education, health, labor, and other supporting factors (Lonska & Mietule, 2015).

Based on this background, the author found a gap or phenomenon in the occurrence of a positive trend in human capital indicators using HDI but with the rate of regional economic growth in the former Kedu Prefecture area still fluctuating. In addition, it was found that previous studies showed differences in findings between variables on economic growth. Based on this, the purpose of this study is to explore whether a similar phenomenon occurs in the former Kedu Prefecture area.

The novelty of this research is measuring the effect of labor variables using labor force indicators. In this study using the years 2017-2023 in the former Kedu Prefecture area with the aim of analyzing the effect of the average length of schooling, life expectancy, per capita expenditure of the labor force as a proxy for human capital variables and investment as a control variable on economic growth and analyzing whether there is a significant difference between the average length of schooling and per capita expenditure before and after the COVID-19 pandemic. Based on this explanation, the author determines the title **"The Effect of Human Capital on Economic Growth Before and After the COVID-19 Pandemic in the Former Kedu Prefecture area in 2017-2023".**

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Endogenous Growth Theory

The endogenous growth model assumes that knowledge capital, the quality of labor education, and investment play an important role in promoting economic growth (Nurlaili & Sugiharti, 2023). The endogenous model specifically places human capital and Research and Development (R&D) as the main factors in driving economic growth. Productivity in this model is not considered as an external (exogenous) factor, but rather treated as an internal (endogenous) factor associated with capital growth. Human productivity plays an important role in determining output, where this productivity is influenced by the knowledge humans have to create and utilize new technologies. It is understood that human knowledge and skills are key elements in driving technological innovation and economic growth (Anfasa, 2021).

Human Capital

Human capital plays a crucial role in economic growth by improving individual capabilities, skills, and knowledge (Adriani, 2019). Investment in human capital includes education and health (Todaro & Smith, 2015). There are two primary approaches to human capital theory:

1. Education
   Education enhances individuals' skills and productivity, positively impacting economic growth (Suhendra, 2020). The average years of schooling (RLS) is a commonly used indicator to measure educational attainment (Busmah & Sugiarto, 2022).
2. Health
   Health is a vital indicator of human well-being and productivity. Life expectancy (AHH) is a widely used measure to assess the health quality of a population (World Health Organization, 2020).
3. Labor Force
   The labor force represents the working-age population engaged in economic activities. The workforce contributes significantly to production and economic output (Nurkholis, 2018).

Investment

Investment is a key driver of economic growth, enhancing economic capacity and capital stock (Jhingan, 2014). Investments are categorized into Foreign Direct Investment (FDI) and Domestic Investment (PMDN) (Maharani & Isnowati, 2014).

Impact of COVID-19

The COVID-19 pandemic significantly affected economic growth, education, and labor markets due to mobility restrictions (Yuliana, 2020). The pandemic disrupted education, leading to a decline in average years of schooling (Cerelia et al., 2021), and affected per capita expenditure and labor force participation (Prayogo & Sukim, 2021).

Based on the literature review, the following hypotheses are proposed:

H1: Average Length of Schooling has a positive impact on economic growth in the former Kedu Prefecture area.

Supported by Rasnino et al. (2022) and Putriana & Aji (2022), which found a significant relationship between education and economic growth.

H2: Life Expectancy has a positive impact on economic growth in the former Kedu Prefecture area.

Supported by Fauziah et al. (2024) and Raynaldhi (2015), which demonstrated a significant relationship between life expectancy and economic growth.

H3: Per Capita Expenditure has a positive impact on economic growth in the former Kedu Prefecture area.

Supported by Swastika & Arifin (2023) and Ariani & Nani (2021), which found a significant relationship between per capita expenditure and economic growth.

H4: Labor Force Participation has a positive impact on economic growth in the former Kedu Prefecture area.

Supported by Maharani & Isnowati (2014) and Patriamurti & Septiani (2020), which found a significant relationship between labor force and economic growth.

H5: There is a significant difference in Average Length of Schooling before and after the COVID-19 pandemic in the former Kedu Prefecture area.

Supported by Cerelia et al. (2021), which found that educational attainment was affected during the pandemic.

H6: There is a significant difference in Per Capita Expenditure before and after the COVID-19 pandemic in the former Kedu Prefecture area.

Supported by Prayogo & Sukim (2021), which found that household expenditure patterns changed significantly due to the pandemic.

RESEARCH METHODS

This research was conducted using quantitative research methods consisting of a total of 5 regencies and 1 city in the former Kedu Prefecture area of Central Java Province in 2017-2023. Secondary data used, including data on Average Years of Schooling (RLS), Life Expectancy Rate (AHH), per capita expenditure, total labor force, and realization of Domestic Investment (PMDN) as well as Gross Domestic Product (GRDP) data based on regional constant prices in the former Kedu Prefecture area obtained from the Central Java Statistics Agency website. Data analysis techniques using panel data and Wilcoxon test with the help of EViews 10. The Wilcoxon test is one of the average difference tests that is expected to determine the conditions before the COVID-19 pandemic and after the COVID- 19 pandemic.

RESULTS AND DISCUSSION

Model Selection

The panel data regression model selection was conducted to select the best model to be used in the study between the common effect model, fixed effect model, and random effect model. The model selection test conducted in this study used the Chow Test and The Lagrange Multiplier Test. Based on the results of Chow Test and The Lagrange Multiplier Test, the best model used in this study is the common effect model.

Multicollinearity Test

The multicollinearity test in this study was carried out by examining the centered variance inflation factor value (Ghozali, 2016). An independent variable is said to escape multicollinearity symptoms if the VIF value is <10. The test provides information on the VIF value of all variables below or smaller

than 10. That is, it can be concluded that the regression model in this study does not show any multicollinearity problems.

Heteroscedasticity Test

The Glesjer test is used to detect the presence of heteroscedasticity. Heteroscedasticity symptoms do not occur in the regression model if the probability value exceeds α (significant > 0.05/5%). The test provides information that all variables have a probability> 0.05. That is, it is said that the regression model in this study does not show any heteroscedasticity problems.

Panel Data Regression Analysis

The panel data regression equation in this study is as follows:

$$LnPDRB(PE)_{it} = 4.324 + 2.248LnRLS_{it} - 0.126LnAHH_{it} + 0.944LnPPP_{it} + 0.603LnAK_{it} + 0.047LnInv_{it}$$

Hypothesis Test

Coefficient of Determination

The regression results with the common effect model show that the coefficient of determination (Adjusted R-squared) is 0.308715. This means that the variables of average years of schooling, life expectancy, per capita expenditure, and labor force and investment can contribute 30.9% to economic growth, while 69.1% is explained by other variables not included in the model.

F Test

Analysis of the F test is done using a significance level of 0.05. The regression results show that the significance value is 0.002205 < 0.05. Based on this, it is concluded that the variables of average years of schooling, life expectancy, per capita expenditure, labor force and investment together have an influence on economic growth in the former Kedu Prefecture area.

t Test

The results of hypothesis testing can be summarized in the following table:

Table 1. Partial Test Result

Hypothesis		Effect	Result
H1	Average length of schooling has a positive effect on economic growth	Positive and significant	Accepted
H2	Life expectancy has a positive effect on economic growth	Negative and not significant	Rejected
H3	Per capita expenditure has a positive effect on economic growth	Positive and not significant	Rejected
H4	Labor force has a positive effect on economic growth	Positive and significant	Accepted
H5	There is a significant difference between the average years of schooling before and after the COVID-19 pandemic	There is no significant difference	Rejected
H6	There is a significant difference between per capita expenditure before and after the COVID-19 pandemic	There is no significant difference	Rejected

Source: data processed, 2024

Mean Difference Test

The Wilcoxon test is a test that serves to understand whether there is a significant change in the average of two groups of interrelated data. The results of the Wilcoxon test can be summarized in the following table:

Table 2. Wilcoxon Test Result

Variable	*Wilcoxon/Mann-Whitney*		
	Before *COVID-19*	After *COVID-19*	Probability
Average Length of Schooling	7.80	8.25	0.1172
Per Capita Expenditure	22.818	24.858	0.2997

Source: data processed, 2024

The Effect of Average Length of Schooling on Economic Growth

The results of this study indicate that the average length of schooling has a significant positive effect on economic growth in the former Kedu Prefecture area in 2017-2023. This is because the average length of schooling in this region continues to increase from 2017-2023. The increase can be achieved by the government's efforts to improve the accessibility and quality of education through a significant increase in the allocation of BOS funds in the last 2 years and the provision of supporting programs in the form of socialization about the importance of education. This study proves the relevance of endogenous theory that emphasizes the importance of knowledge capital as a driver of economic growth. The results of this study are also in line with and reinforced by the studies of Maulana (2015); Putriana & Aji (2022); Rasnino et al., (2022) which state that the average years of schooling has a significant positive effect on economic growth. Increasing the average years of schooling contributes to improving the quality of labor education and ultimately improves performance and spurs economic progress.

The Effect of Life Expectancy on Economic Growth

The results of the analysis show that life expectancy has no statistically significant effect on economic growth in the former Kedu Prefecture area in 2017-2023. This is due to potential inequality in access or utilization of formal health services. Most people in the former Kedu Prefecture tend to deal with health problems on their own due to easy access to over-the-counter medicines and disparities in health services, especially in rural areas. Although health facilities have improved in the last five years, the quality of services and affordability are still constraints, coupled with low public health literacy. The COVID-19 pandemic has exacerbated the situation with fear of transmission and social restrictions reducing visits to health facilities. The results of this study strengthen the studies of Hepi & Zakiah (2018) and Nurwijayati (2017) which state that life expectancy has an insignificant effect on economic growth.

The Effect of Per Capita Expenditure on Economic Growth

Based on the results of the analysis, per capita expenditure does not have a significant effect on economic growth in the former Kedu Prefecture region in 2017-2023. Inequality in expenditure distribution is the main factor in this condition. The high difference in per capita expenditure between community groups is related to the disparity in income received. The pattern of expenditure disparity experienced by the regencies and cities of the former Kedu Prefecture is where the richest population group (upper 20%) has a much larger proportion of expenditure than the lower 40% group. This leads to uneven consumption and limited purchasing power of the lower group for basic needs. The results of this study reinforce the studies of Padli et al. (2020); Huda & Indahsari (2021); Ahmada et al. (2023) which state that per capita expenditure has an insignificant effect on economic growth. Under conditions of inequality, the bottom 40% group with low purchasing power contributes little to economic activity, while the richest group is more likely to spend money on non-productive needs. As a result, although per capita expenditure statistically increases, it does not provide a significant boost to economic growth.

The Effect of Labor Force on Economic Growth

Based on the results of the analysis, the labor force has a significant positive effect on economic growth in the former Kedu Prefecture region in 2017-2023. This is because the number of labor force in this region continues to increase from 2017-2023, thus encouraging economic mobility and economic growth through optimal utilization of production factors in each region. In this case, the high participation rate is an important factor that contributes to the expansion of the labor force and the increase in the production of goods and services. In the last three years, the Labor Force Participation Rate (TPAK) in the former Kedu Prefecture has shown an increasing trend, with Magelang Regency having the highest TPAK, reflecting its large labor potential. Based on Sakernas August 2023, the tertiary sector is the main employment in this region, including trade, transportation, financial services, education, and health. This condition shows the optimal utilization of human resources in supporting the regional economy. This research proves the relevance of the Solow-Swan theory, which suggests that economic growth is influenced by the addition of factors of production, including labor. The results of this study are also in line with and reinforced by Loka et al. (2024); Haq & Yuliadi study (2018); Maharani & Isnowati (2014) which states that the labor force has a significant positive effect on economic growth.

Differences in Average Length of Schooling Before and After COVID-19

Based on the analysis, there is no significant difference in the average length of schooling between the period before and after the COVID-19 pandemic. The average length of schooling showed an increase, but it was not significant. The COVID-19 pandemic did cause major disruptions in the education sector. This is evidenced by the implementation of distance learning and an increase in dropout rates, but the impact was not large enough to significantly affect the overall average years of schooling. This indicator tends to be slow to change as it reflects the long-term pattern of education which is not easily affected by one specific event, including the pandemic.

Differences in Expenditure per Capita Before and After COVID-19

Based on the analysis, there is no significant difference in per capita expenditure between the period before and after the COVID-19 pandemic. The statistical test results show an increase, but it is not significant. The COVID-19 pandemic has put severe economic pressure on most households, especially those in low-income groups. This has encouraged people to reduce spending or prioritize basic needs. The increase in post-pandemic per capita expenditure tends to be concentrated in the top 20% group, while the middle and lower groups experience no change. This suggests that the impact on the economy as a whole is still limited. Consumption in the lower group, which has a larger multiplier effect, did not show a significant improvement. In contrast, those in the top 20% were still able to increase their spending, but their contribution was not enough to drive a statistically significant difference as this group only reflects a small portion of the overall population.

CONCLUSION

Based on the results of testing and data analysis, the average length of schooling and labor force variables are human capital variables that have a significant effect on the economic growth variable in the former Kedu Prefecture area in 2017-2023. Life expectancy, per capita expenditure, and investment are human capital variables that do not have a significant effect on the economic growth variable in the former Kedu Prefecture area in 2017-2023. The average length of schooling and per capita expenditure in the former Kedu Prefecture area did not experience significant differences before and after COVID-19. Through this research, the appropriate policy implications should be that local governments need effective management of education funds, close supervision, and solutions to access barriers, such as the provision of school buses for difficult areas as an effort to increase the average length of schooling in the former Kedu Prefecture area. In addition, local governments need to arrange local potential-based skills training, such as tourism, agribusiness, and digitalization for

small and medium enterprises, with industry collaboration to make the program more targeted and sustainable. This research was conducted only in a short observation year. Future research is expected to add a longer period of time so that later it can analyze more deeply to see how a particular variable or phenomenon can develop or change over time.

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