How Can Gross Enrollment Ratio, Life Expectancy, and Labor Force Participation Rate Affect Regional Gross Domestic Product? (Case Study in Bojonegoro Regency 2010-2021)

Faishal Fadli*, Department of Economics, Faculty of Economics and Business, Universitas Brawijaya, Malang, Indonesia; faishaldli@ub.ac.id
Vietha Devia SS, Department of Economics, Faculty of Economics and Business, Universitas Brawijaya, Malang, Indonesia; vietha.devia@ub.ac.id

Abstract
Increasing economic growth is the main goal in regional development, including Bojonegoro Regency. However, according to BPS East Java Province, Bojonegoro Regency recorded that in 2020 and 2021 it experienced a decline in economic growth, namely around -0.04% and 5.04%. In fact, in 2021 Bojonegoro Regency will be the region with the lowest economic growth in East Java. Economic growth is influenced by many factors, some of which are education factors, health factors, and labor factors. Therefore, this research was conducted with the aim of finding out the influence of the Gross Enrollment Ratio, Life Expectancy Rate, and Number of Labor Force on Gross Regional Domestic Product in Bojonegoro Regency in 2010-2021 with inflation control. This research uses quantitative methods with Multiple Linear Regression Analysis. The sampling technique used in this research is a saturated sampling technique or total sampling.

Keywords
Gross Enrollment Ratio, Life Expectancy Rate, Number of Labor Force, Gross Regional Domestic Product

Introduction

Bojonegoro Regency's GRDP tends to experience positive growth. However, this growth decreased in 2020 by 282.26 billion Rupiah compared to the previous year. The peak will occur in 2021, making it the region with the lowest economic growth of the 38 districts/cities in East Java Province. One of the causes of the decline in Bojonegoro Regency's economic growth is the decline in the value of the sector that makes the largest contribution, namely mining and quarrying. The mining and quarrying sector experienced low growth in 2020, namely 0.02% from the previous year and experienced a sharp decline in 2021 which was around -11.61%. Apart from that, the second largest contributor, namely the agriculture, forestry and fisheries sectors, also experienced low growth in 2020, namely around 0.65% in 2020 and experienced a decline of -1.21% in 2021. These two sectors have an average total contribution to GRDP. more than 60%, so that negative changes in these two sectors make economic growth in Bojonegoro Regency negative.

The neo-classical growth theory put forward by Solow-Swan states that economic growth is influenced by the development of production factors, which include the availability of capital, quality and quantity of labor and technological intervention (Budihardjo et al., 2021). The labor variable in question is the working age population who are employed according to their main employment status. In previous research conducted by Agustin, it was stated that one of the most important factors in production

DOI: doi.org/xxxxxxxxxx

is the labor factor (Agustin et al., 2018). Panelewen et al., through research conducted in Manado City, stated that labor factors had a positive and significant influence on the growth of Gross Regional Domestic Product (Panelewen et al., 2020). The number of Bojonegoro Regency Labor Force (JAK) can be seen in graph 1 below. In accordance with the positive trend which tends to fluctuate on the graph, it can be said that the availability of the workforce in Bojonegoro Regency has increased sharply overall. This will be a large capital to increase the economic growth of Bojonegoro Regency. Based on neo-classical growth theory, the quantitative availability of labor as seen from the number of the workforce will increase production output and is also expected to increase economic growth.

Meanwhile, the quality of the workforce can be represented through Human Capital. Human Capital *is* an individual aspect which includes internal abilities such as skills and knowledge obtained as an accumulation of the results of certain activities within a certain period of time carried out by the individual (Rastogi, 2002). Todaro (in Puspasari, 2020) explains that *Human Capital* can be measured through the fields of education and health. Gross Enrollment Ratio (APM) is an indicator used to determine the percentage of school participation according to the level of education and age group (Hikma et al., 2019). Meanwhile, one indicator that represents the level of public health in a certain area and time period is the Life Expectancy Rate (AHH).

Judging from the neo-classical Solow-Swan growth theory, the growth of production factors will increase production output which will ultimately lead to an increase in overall GRDP.

In the case of Bojonegoro Regency, it shows an increase in the number of workers, the quality of education and health, but there has actually been a significant decline in GRDP in recent years. This then became the background for the author to conduct research entitled

"The Influence of Human Capital on Regional Income of Bojonegoro Regency 2010-2021."

Research Methods

Multiple linear regression analysis is a method for testing the relationship between a dependent variable and two or more independent variables. The purpose of this test is to predict and estimate the magnitude of the dependent variable which refers to the magnitude of the known independent variable (Gujarati, 2003) . The results of the multiple linear regression analysis are in the form of numerical coefficients for each independent variable. This coefficient was obtained through the equation model used in research (Ghozali, 2018) .

In this study, multiple linear regression analysis was used to measure the relationship between Life Expectancy Rate, Gross Enrollment Ratio and Number of Labor Force as independent variables to Gross Regional Domestic Product as the dependent variable in Bojonegoro Regency. The basic model form of equation for multiple linear regression analysis used is:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + e$$

Information :

Y = Gross Regional Domestic Product of Bojonegoro Regency (billion Rupiah)
α = Constant (Y value when X value is equal to zero)
$\beta 1,2,3$ = Coefficient for Each Variable X (independent variable)
$X1$ = Life Expectancy Rate for Bojonegoro Regency (years)

DOI: doi.org/xxxxxxxxxx

$X2$ = Bojonegoro Regency Gross Enrollment Ratio (percent)
$X3$ = Number of Bojonegoro Regency Labor Force (people)
$X4$ = Bojonegoro Regency YoY Inflation Rate (percent)
e = Standard Error

Results and Discussion

Linear Interpolation

This research uses data on life expectancy, Gross Enrollment Ratio, labor force, inflation and gross regional domestic product in Bojonegoro Regency for the 2010-2021 period. So the number of data (n) contained in this research is 12 data. The amount of data does not meet the standards for appropriateness of data processing according to Sugiyono (2017), namely the range of 30 to 500 data. To overcome this problem, linear data interpolation was used using the EViews12 data processing application using the *quadratic match sum method* . The results of applying this method are as follows.

Table 1. Interpolation Results with EViews12

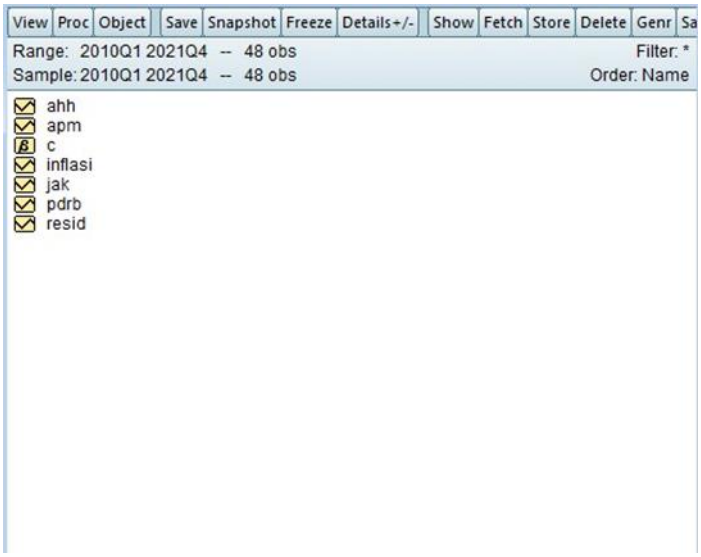


Table 2 above is the result of linear data interpolation using the *quadratic match sum method* which breaks down annual data into quarterly data. This means that every 1 piece of data in the form of a year is divided into 4 pieces of data in the form of quarters, so that in this study we obtained 48 pieces of data in the form of quarters. The amount of interpolated data ensures that the feasibility standards for data processing in this research are met.

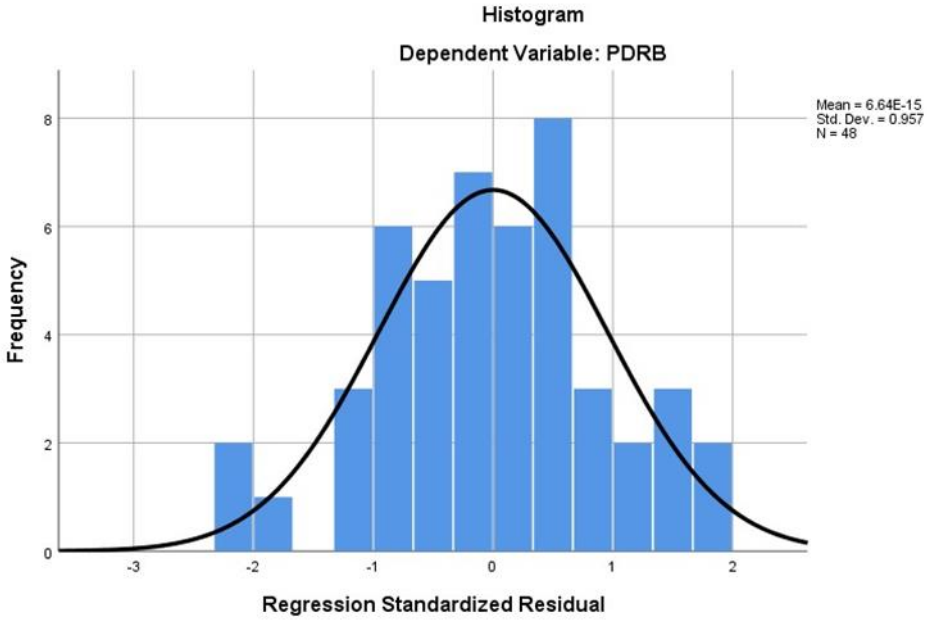
Classic Assumption Test

The analysis and processing of the data used in this research begins with carrying out classical assumption tests. The classical assumption test is a prerequisite before carrying out further data processing. The classical assumption test aims to ensure that the regression equation model obtained has accuracy in its estimation, *Best Linear Unbiased Estimator* (BLUE) and is consistent. The classical assumption tests used in this research include the normality test, multicollinearity test, autocorrelation test, linearity test and heteroscedasticity test.

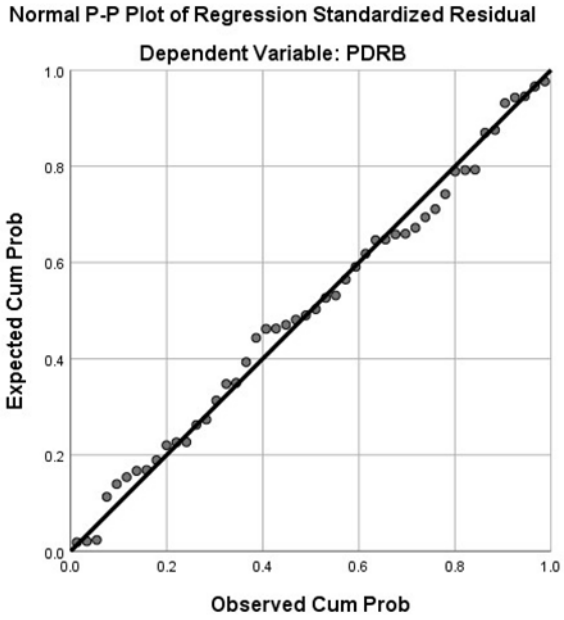
a. *Normality test*

DOI: doi.org/xxxxxxxxxx

The Normality Test is used to determine whether the data used is normally distributed or not. The Normality Test aims to ensure that the processed data has homogeneous data variance with a central tendency. The results of the normality test can be seen in the following discussion.



Graph 1. Residual Distribution Graph



Graph 2. Normal P-Plot Graph

DOI: doi.org/xxxxxxxxxx

Table 2. Table of Kolmogorov-Smirnov Estimates

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		48
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	8476.887349
Most Extreme Differences	Absolute	.066
	Positive	.051
	Negative	-.066
Test Statistic		.066
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

In graph 6 above it can be seen that the curve formed is a curve that is balanced to the left and right. The same thing is also illustrated by graph 7 which shows the distribution of data that moves around the diagonal line and there is no data that is far from the diagonal line on the graph. Then, when tested using the KolmogorovSmirnov *nonparametric test* as in table 3, it shows that *the asymp.sig* (2- *tailed*) value is greater than the alpha significance value of 0.05, namely 0.200, meaning that the data set shows a normal distribution. Based on the three parameters above, it can be said that the data set used passed the normality test and had a normal distribution.

b. *Multicollinearity Test*

Multicollinearity test is used to find out whether there is a correlation or relationship between the independent variables. Data that contains symptoms of multicollinearity causes partial regression coefficients to create high standard errors, thus making the regression equation model inaccurate. The results of the Multicollinearity Test of the data set can be seen as follows.

Table 3. Table of Multicollinearity Estimates

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	AHH	.546	1.831
	APM	.740	1.351
	Angkatan Kerja	.827	1.210
	Inflasi	.491	2.038

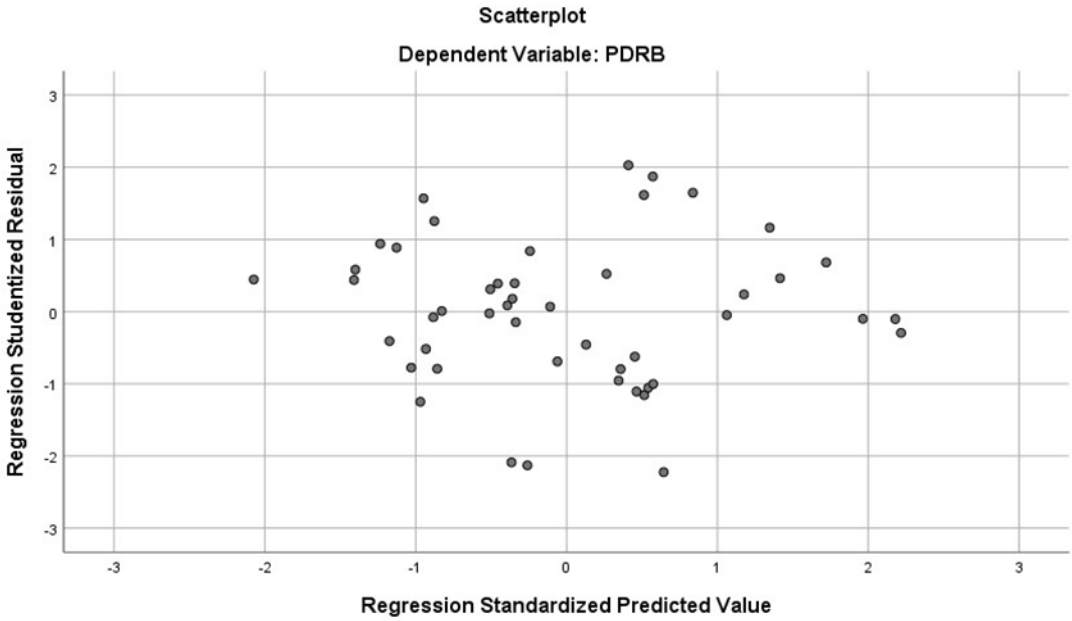
a. Dependent Variable: PDRB

DOI: doi.org/xxxxxxxxxx

A data set is said to have no symptoms of multicollinearity if the VIF (*Variance Inflation Factor*) value is less than 10 and *the Collinearity Tolerance value* is more than 0.1. From table 4 above it can be seen that the VIF values of all variables are less than 10 and the *Collinearity Tolerance values* are all more than 0.1. This means that the data set used does not show any symptoms of multicollinearity and is declared to have passed the multicollinearity test.

c. *Heteroscedasticity Test*

The heteroscedasticity test aims to find out whether in the regression equation model there are differences in the variance of the residuals. Data that does not meet the heteroscedasticity test makes the regression equation model invalid as a forecasting model. The results of the Heteroscedasticity test can be seen in the following table and graph.



Graph 3. Residual Scatterplot Graph

Table 4. Glejser Test Estimation Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	9.866	7.377		1.338	.191
	AHH	-3.355	2.351	-.336	-1.427	.164
	APM	.080	.222	.073	.359	.722
	Angkatan Kerja	5.614E-5	.218	.000	.000	1.000
	Inflasi	-.036	.038	-.239	-.965	.342

a. Dependent Variable: Abs_Res

The Glejser test is used to determine whether the regression equation model used has symptoms of heteroscedasticity by transforming the residual values into absolute form. A regression equation model is declared free of heteroscedasticity symptoms if the significance value of each variable is greater than 0.05. Based on

table 5 above, it can be seen that the significance value of each variable is greater than 0.05. Apart from that, the distribution of data shown in graph 8 does not form a particular pattern. The data distribution shows a random location above and below the number 0 on the Y axis, so it can be said that the data set used did not show any symptoms of heteroscedasticity and was declared to have passed the heteroscedasticity test.

d. *Autocorrelation Test*

The Autocorrelation Test aims to find out whether in the regression equation model there is a relationship between the residuals for period t and the residuals from the previous period. Data that does not meet the autocorrelation test makes the regression equation model bad because it creates parameters that do not make sense and are beyond logical. To determine whether or not there are symptoms of autocorrelation in the model, a comparison is made between the Durbin-Watson (d) value and the dU and 4-dU values. A regression equation model does not have autocorrelation if the d value is between the dU and 4-dU values. The results of the autocorrelation test can be seen in the following table.

Table 5. Table of Autocorrelation Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.853[a]	.727	.702	8862.39521	.462

a. Predictors: (Constant), Inflasi, AHH, Angkatan Kerja, APM

b. Dependent Variable: PDRB

Based on table 6 above, it can be seen that the d value is 0.462 and the dU value with k=4 and n=48 in the Durbin-Watson table with a significance of 0.05, so the dU value is 1.7206 so the 4-dU value is 2.2794 . The d value in table 6 above shows a value that is smaller than the dU and 4-dU values, so that the data obtained has symptoms of autocorrelation. To overcome this, the researchers applied treatment to the data using the Cochrane-Orcutt method to increase the DurbinWatson value and eliminate the symptoms of autocorrelation.

Table 6. Table of Autocorrelation Treatment Results Using the Cochrane-Orcutt Method

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.877[a]	.769	.740	.18895	1.857

a. Predictors: (Constant), Inflasi, APM, Angkatan Kerja, AHH

b. Dependent Variable: PDRB

After being treated using the Cochrane-Orcutt method, the data obtained showed a significant increase in the d value to 1.857 as shown in table 7. The d value obtained showed a value that was greater than the dU value and smaller than the 4dU value. So after treatment, the data set used was free from autocorrelation symptoms and was declared to have passed the autocorrelation test.

e. *Linearity Test*

The linearity test aims to find out whether in the regression equation model there is a linear relationship between the independent variable and the dependent variable or not. Data that does not show a linear relationship means that data processing cannot be carried out using the linear regression method but instead uses the non-linear regression method. The data obtained can be said to be linear if the significance value of *Deviation from Linearity* is greater than the *Alpha* value of 0.05. The results of the linearity test for each independent variable can be seen in the following table.

1. Relationship between Life Expectancy and Gross Domestic Product

Table 7. Table of Linearity Test Results for Life Expectancy Variables

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
PDRB * AHH	Between Groups	(Combined)	.782	5	.156	1.088	.382
		Linearity	.003	1	.003	.021	.884
		Deviation from Linearity	.779	4	.195	1.354	.267
	Within Groups		5.748	40	.144		
	Total		6.530	45			

Based on table 8 above, the relationship between Life Expectancy and Gross Regional Domestic Product shows that the significance value of *Deviation from linearity* is greater than 0.05, namely 0.267. This means that there is a linear relationship between the Life Expectancy variable and the Gross Regional Domestic Product variable.

2. The Relationship between Gross Enrollment Ratio and Gross Domestic Product

Table 8. Table of Linearity Test Results for Gross Enrollment Ratio Variables

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
PDRB * APM	Between Groups	(Combined)	.360	7	.051	.316	.942
		Linearity	.163	1	.163	1.002	.323
		Deviation from Linearity	.197	6	.033	.202	.974
	Within Groups		6.170	38	.162		
	Total		6.530	45			

Based on table 9 above, the relationship between Gross Enrollment Ratio and Gross Regional Domestic Product shows the significance value of *Deviation from linearity* is greater than 0.05, namely 0.974. This means that there is a linear relationship between the Gross Enrollment Ratio variable and the Gross Regional Domestic Product variable.

3. The Relationship between the Number of the Labor Force and Gross Domestic Product

Table 9. Table of Linearity Test Results for Labor Force Variables

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
PDRB * Angkatan Kerja	Between Groups	(Combined)	1.449	5	.290	2.282	.065
		Linearity	.821	1	.821	6.466	.015
		Deviation from Linearity	.628	4	.157	1.236	.311
	Within Groups		5.080	40	.127		
	Total		6.530	45			

Based on table 10 above, the relationship between the number of labor force and Gross Regional Domestic Product shows that the significance value of *Deviation from linearity* is greater than 0.05, namely 0.311. This means that there is a linear relationship between the variable number of labor force and the variable Gross Regional Domestic Product.

4. The Relationship between Inflation and Gross Domestic Product

Table 10. Table of Linearity Test Results for Inflation Variables

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
PDRB * Inflasi	Between Groups	(Combined)	3.463	21	.165	1.534	.207
		Linearity	1.600	1	1.600	14.884	.002
		Deviation from Linearity	1.862	20	.093	.866	.625
	Within Groups		1.505	14	.108		
	Total		4.968	35			

Based on table 11 above, the relationship between inflation and Gross Regional Domestic Product shows that the significance value of *Deviation from Linearity* is greater than 0.05, namely 0.625. This means that there is a linear relationship between the inflation variable and the Gross Regional Domestic Product variable.

Tests for all independent variables and dependent variables all show a linear relationship. This makes the processing method for the data obtained more suitable using a linear regression model and is declared to have passed the linearity test.

Multiple Linear Regression Analysis

After the classical assumption test is carried out and the data set and model are declared to have passed, it will proceed to the next analysis, namely multiple linear regression analysis. Multiple linear regression analysis aims to predict and estimate the magnitude of the dependent variable which refers to the magnitude of the known independent variable. The following are the estimation results from the regression equation model.

Table 11. Table of Regression Model Estimation Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	57.266	10.358		5.528	.000
	AHH	-20.713	3.301	-.732	-6.274	.000
	APM	1.295	.311	.417	4.162	.000
	Angkatan Kerja	.804	.306	.249	2.629	.013
	Inflasi	-.443	.053	-1.034	-8.400	.000

a. Dependent Variable: PDRB

Based on table 12 above, the results of the regression equation model obtained are:

$$Y = 57{,}266 - 20{,}713X1 + 1{,}295X2 + 0{,}804X3 - 0{,}443X4 + e$$

In the equation above it can be seen that the value α= 57,266, then GRDP will be worth 57,266 billion Rupiah assuming that the Life Expectancy Rate (X $_1$), Gross Enrollment Ratio (X $_2$), Number of Labor Force (X $_3$), and Inflation (X $_4$) are worth zero.

a. *The Influence of Life Expectancy on the GRDP of Bojonegoro Regency*
   The Life Expectancy Rate (X $_1$) in the regression model above is -20.713, which means that the Life Expectancy Rate for Bojonegoro Regency increases by 1 year, which will cause a decrease in the GRDP of Bojonegoro Regency by 20.713 billion Rupiah assuming that the other independent variables are constant (ceteris paribus *).*
   The Life Expectancy Coefficient depicted through values $\beta_1$shows that AHH has a negative influence on the GRDP of Bojonegoro Regency. This means that every increase in AHH will be accompanied by a decrease in GRDP, and vice versa, every decrease in AHH will also be followed by an increase in Bojonegoro Regency's GRDP.
b. *The Influence of Gross Enrollment Ratio on the GRDP of Bojonegoro Regency*
   The next variable is the Gross Enrollment Ratio (X $_2$) which is shown in the regression equation model above which shows a coefficient (β_2) of 1.295. This shows that APM has a positive influence on the GRDP of Bojonegoro Regency. This means that an increase in the APM of 1% will cause an increase in the GDP figure of 1.295 billion Rupiah, and vice versa, a decrease in the APM of 1% will be followed by a decrease in the Bojonegoro Regency GRDP figure of 1.295 billion Rupiah, assuming the other independent variables are constant (*ceteris paribus*).
c. *The Influence of the Number of Labor Forces on the GRDP of Bojonegoro Regency*
   The variable Number of Labor Force (X $_3$) in the regression equation model above shows a coefficient (β_3) of 0.804. This means that the JAK variable has a positive effect on the GDP figures for Bojonegoro Regency. Increasing the number of the workforce by 1 person will increase the GDP figure by 0.804 billion Rupiah. This also applies for every decrease in JAK by 1 person, it will be followed by a decrease in the GRDP value of Bojonegoro Regency by 0.804 billion Rupiah with the assumption that other independent variables are constant (*ceteris paribus*).

Hypothesis Testing

a. Determinant Coefficient Test (R 2)
   The determinant coefficient test (R2) aims to determine the ability of the independent variables in the model to explain the variance of the dependent

variable. This research explains how influential the variables life expectancy, Gross Enrollment Ratio, labor force and inflation are on gross regional domestic product. The results of testing the determinant coefficient are as follows.

Table 12. Table of Determinant Coefficient Estimation Results

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877[a]	.769	.740	.18895

a. Predictors: (Constant), Inflasi, APM, Angkatan Kerja, AHH

Based on table 14 of the estimated results of the multiple linear regression test, it can be seen that the determinant coefficient (R2) is 0.769 or 76.9%. This means that the variables Life Expectancy, Gross Enrollment Ratio, Labor Force and Inflation are able to explain 76.9% of the variance in the GRDP variable in Bojonegoro Regency. Meanwhile, 23.1% of the variance in GRDP in Bojonegoro Regency is influenced by variables outside the research model.

b. Simultaneous Test (F Test)

Table 13. Anova table

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.695	4	.924	25.872	.000[b]
	Residual	1.107	31	.036		
	Total	4.802	35			

a. Dependent Variable: PDRB

b. Predictors: (Constant), Inflasi, APM, Angkatan Kerja, AHH

To determine whether or not there is a joint or simultaneous influence of Life Expectancy Rate, Gross Enrollment Ratio, Labor Force, and Inflation on Gross Regional Domestic Product in Bojonegoro Regency in 2010-2021, the following test was carried out.

1. By comparing F Calculation with F Table
   - H 0 is accepted or H 1 is rejected, if F Calculated is smaller than F Table
   - H 0 is rejected or H 1 is accepted, if F Calculated is greater than F Table
2. Basis for decision making
   Based on the results of the comparison between F Calculation and F Table , F Calculation shown in table 15 is 25.872 > F Table of 2.589. The calculated F value is greater than F. The table shows that H0 is rejected and H1 is accepted. This means that the Life Expectancy Rate, Gross Enrollment Ratio, Labor Force and Inflation have a joint influence on the Gross Regional Domestic Product in Bojonegoro Regency in 2010-2021. Apart from that, the significance value of the equation model shows a value smaller than 0.05, namely 0.000 and the direction of influence shown is positive. So the simultaneous influence shown by the estimation results is a significant positive influence.

c. Partial Test (t Test)

Table 14. Table of Independent Variable Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	57.266	10.358		5.528	.000
	AHH	-20.713	3.301	-.732	-6.274	.000
	APM	1.295	.311	.417	4.162	.000
	Angkatan Kerja	.804	.306	.249	2.629	.013
	Inflasi	-.443	.053	-1.034	-8.400	.000

a. Dependent Variable: PDRB

To find out whether there is a partial influence or not from each independent variable on the dependent variable, a comparison is carried out using criteria including the following.

- H 0 is accepted or H 1 is rejected, if t Calculated is smaller than t Table
- H 0 is rejected or H 1 is accepted, if t Calculated is greater than t Table

Based on the criteria above, the results obtained from the calculations for each independent variable are as follows.

1. Life expectancy
   Based on the regression coefficient table, Life Expectancy has a calculated t value of 6.274 > t table of 1.677 . This means that Life Expectancy has a partial influence on Gross Regional Domestic Product in Bojonegoro Regency in 2010-2021. Apart from that, the significance value of the Life Expectancy variable shows a value that is smaller than 0.05, namely 0.000 and the direction of influence shown is negative. So the partial influence shown by the Life Expectancy variable is a significant negative influence.
2. Pure Participation Figures
   Based on the regression coefficient table, the Gross Enrollment Ratio has a calculated t value of 4.162 > t table of 1.677 . This means that the Pure Participation Figure has a partial influence on the Gross Regional Domestic Product in Bojonegoro Regency in 2010-2021. Apart from that, the significance value of the Gross Enrollment Ratio variable shows a value smaller than 0.05, namely 0.000 and the direction of influence shown is positive. So the partial influence shown by the Gross Enrollment Ratio variable is a significant positive influence.
3. Number of Labor Force
   Based on the regression coefficient table, the workforce has a calculated t value of 2.629 > t table of 1.677 . This means that the workforce has a partial influence on the Gross Regional Domestic Product in Bojonegoro Regency in 2010-2021. Apart from that, the significance value of the workforce variable shows a value that is smaller than 0.05, namely 0.013 and the direction of the influence shown is positive. So the partial influence shown by the labor force variable is a significant positive influence.

Discussion

In this research there are 5 variables consisting of one dependent variable, three independent variables and one control variable, each consisting of 48 data. This research aims to determine the effect of life expectancy, Gross Enrollment Ratio and

labor force on gross regional domestic product in Bojonegoro Regency in 2010-2021 with inflation as the control variable.

The regression results state that the $F_{Calculated\ value}$ is 16.956 > greater than the F_{Table} of 2.589 with a significance value smaller than 0.05, namely 0.00. This shows that life expectancy, Gross Enrollment Ratio and labor force have a significant effect on gross regional domestic product with a positive relationship direction, which means that H_1 is accepted and H_0 is rejected.

The Effect of Gross Enrollment Ratio On Gross Regional Domestic Product

The results of the regression state that the Gross Enrollment Ratio partially has a significant influence on gross regional domestic product, but the direction shown in the test is positive.

This is shown by the $_{calculated\ t\ value}$ of 3.537 > than t_{table} 1.677 and the significance value is smaller than 0.05, namely 0.001. Apart from that, the regression coefficient value shown by the *Unstandardized Coeficients Beta column* is 1.252, meaning that if the APM variable increases by 1 percent, the GRDP value will increase by 1.252 billion Rupiah. The results of this research show that Hypothesis 1: "The Gross Enrollment Ratio has a positive and significant influence on GRDP in Bojonegoro Regency" is accepted.

Based on the theory explained previously, this research shows results that are in line with the *Human Capital theory* put forward by Todaro (in Puspasari, 2020) which states that education has a positive effect on economic growth through increasing individual human abilities and skills. This means that the higher an individual's education for those who do not work, the opportunity to get a job will increase. Meanwhile, for individuals who are already working, higher education will increase production efficiency and effectiveness which will ultimately lead to increased economic growth.

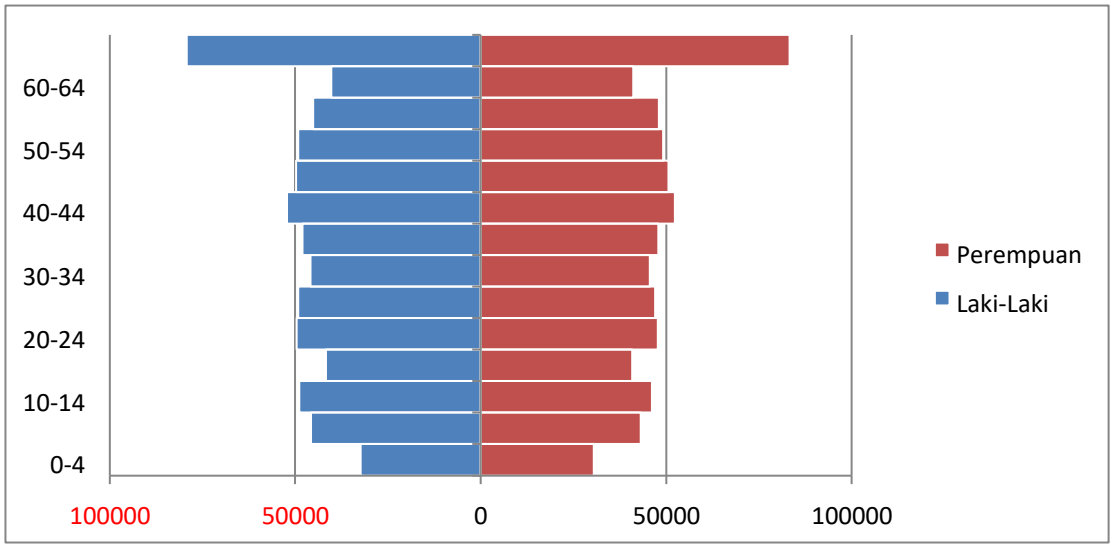
The results of this research are supported by research conducted by Arif (2014) which found that the Gross Enrollment Ratio partially had a positive effect on economic growth in Indonesia (Arif, 2014) . In this research, it was stated that educational participation showed little value, so the impact would not be felt in the near future. However, research from Ria (2016) states the opposite, namely that the Gross Enrollment Ratio has a negative effect on GRDP growth in DKI Jakarta (Ria & Nurranto, 2016) . In this research, it was stated that if the participation rate increases, the value of GRDP will decrease, and vice versa, if the participation rate decreases, the value of GRDP will increase.

The Influence of Life Expectancy On Gross Regional Domestic Product

The results of the regression state that partial life expectancy has a significant influence on gross regional domestic product, but the direction shown in the test is negative. This is shown by the $_{calculated\ t\ value}$ of 5.395 > than t_{table} 1.677 and the significance value is smaller than 0.05, namely 0.00. Apart from that, the regression coefficient value shown by the *Unstandardized Coeficients Beta column* is -20.470, indicating that if the AHH variable increases by 1 year, the GRDP value will decrease by 20.470 billion Rupiah. The results of this research show that Hypothesis 2: "Life Expectancy has a positive and insignificant influence on GRDP in Bojonegoro Regency" is rejected.

DOI: doi.org/xxxxxxxxxx

According to the Central Statistics Agency (BPS), the elderly population is required to become active and successful individuals in order to improve their own quality of life both economically and health-wise (BPS, 2022) . An increase in the AHH value causes the percentage of elderly people to increase and the birth rate to decrease every year. This indicates an aging *population* . in Indonesia it will almost reach 10% in 2020 and it is projected that in 2045 the elderly population will be one fifth of Indonesia's population. An area is said to be experiencing aging population *when* the percentage of elderly population reaches 10% or more (Heri & Cicih, 2022) . The increase in the number of elderly people causes the support ratio *to* decrease. This reduction in the support ratio has the potential to reduce state income from the productive age population because it covers the elderly population and on the other hand, the state is also required to improve the quality of life of the elderly both economically and in health through the working productive age population (World Bank, 2016) .



Source: Central Statistics Agency, 2023 (processed)

Graph of 4. Bojonegoro Regency Population Pyramids in 2022

Based on the population pyramid of Bojonegoro Regency in the graph above, it shows that the number of elderly people is greater than that of other age groups. The number of elderly residents in Bojonegoro Regency itself in 2022 will exceed 10%, namely 12.03% of the total population of Bojonegoro Regency. On the other hand, the number of people aged under 10 years who are classified in the 0-4 year and 5-9 year age groups is only 11.23% of the total population. This means that in 2022, Bojonegoro Regency will experience an increase in the elderly group and a decrease in the young age group, thereby entering an era of population aging.

Even though the percentage of the elderly population is increasing, this age group still has an influence in increasing economic growth. Based on research conducted by Kurniawati (2021), it is stated that the elderly population group is formed from potential and non-potential elderly residents (Kurniawati & Sugiyanto, 2021) . The forming classification is based on the level of education completed. The majority of people with a high level of education in their productive age get decent jobs so that in old age they are able to support themselves and their families either through old age benefits for the formal sector or income from the informal sector. Apart from that, a high educational background means they will pay more attention and prepare for future conditions while they are still in their productive age. Because the needs of themselves and their families are met, residents with a high level of education are potential

DOI: doi.org/xxxxxxxxxx

residents and do not burden the regional economy. Meanwhile, for elderly people with higher education and still working, generally their abilities and skills are still needed in the world of work so that population groups like this actually contribute to regional economic growth.

As explained in the previous sub-chapter, a low level of education means that the population cannot get a decent job or even not get a job at all, which is likely to increase the unemployment rate. This will of course burden the productive age population due to the decline in the support ratio for the elderly population who are unable to meet their own needs. The group of elderly people who are unable to meet their own needs is a category of nonpotential elderly population and will certainly burden economic growth.

The majority of the elderly population group comes from the non-potential elderly population due to low levels of education. Based on research conducted by Affandi (2009), it was stated that most elderly people when they were still at school age were not supported by adequate educational conditions and facilities because they lived in the colonial era until the postcolonial era (Affandi, 2009) . In this era, it was not uncommon for school-aged people to participate in war to defend the integrity of the country, so the education they received was of course also very low.

The results of this research are supported by research conducted by Handayani (2016) which found that life expectancy partially had a negative effect on economic growth in Bali Province (Handayani et al., 2016) . In this research, it is stated that life expectancy is negative because the availability of jobs is limited, which of course will mean that the workforce will not contribute to economic growth, and will even burden economic movements. This makes the health factor which doubles the contribution of labor worthless or even negative. In line with this research, Okunade and Osmani also stated in their research that life expectancy has a negative effect on economic growth (Okunade & Osmani, 2020) .

However, research from Akasumbawa (2021) states the opposite, that life expectancy has a positive effect on economic growth (Akasumbawa, 2021) . In this research, it was stated that deaths in a region are correlated with the economic level of a region. A developed region tends to have a low death rate.

Based on the previous explanation, it can be said that health factors are not the main factor but are supporting factors for other factors such as education. Health factors will have a positive influence on economic growth when the level of education is high so that it is able to maximize individual abilities and skills and ultimately the quality of human resources also increases so that it does not burden or even contribute to economic growth when the population is in their old age. However, health factors can have a negative effect on economic growth when the level of education is low so that individual abilities and skills are also low which causes economic growth to be burdened when the population is in their old age.

The Effect of The Size of The Workforce On Gross Regional Domestic Product

The results of the regression state that the number of labor force partially has a significant influence on gross regional domestic product, but the direction shown in the test is positive.

This is shown by the $_{\text{calculated t value}}$ of 2.237 > than t $_{\text{table}}$ 1.677 and the significance value is smaller than 0.05, namely 0.034. Apart from that, the regression coefficient value shown by the *Unstandardized Coeficients Beta column* is 0.801, indicating that if the JAK variable experiences an increase of 1 person, the GRDP value will increase by 0.801 billion Rupiah. The results of this research show that Hypothesis 3: "The number

of labor force has a positive and significant influence on GRDP in Bojonegoro Regency" is accepted.
Based on the production function in the Solow-Swan model of economic growth theory, this research shows results that are in line with this theory. The increase in labor input, which in this research is described through the number of labor forces in the neo-classical production function of the Solow-Swan model, causes an increase in production *output* by emphasizing *Constant Return to Scale* (Tarigan, 2014) . In the supply concept *,* the larger the production scale of a company, the smaller the production costs incurred. This ensures that income from the production process can be maximized and will ultimately increase overall GRDP. Largescale production certainly requires large production resources, one of which is labor. The availability of abundant labor has the potential for companies to expand their production scale (Ismei et al., 2015) .
the Demand Pull Inflation concept is usually characterized by excessive demand for goods or services causing the price of the goods or services to rise. The increase in goods or services is usually caused by increased investment, the amount of money circulating in society and increased government spending. This stimulates the production process, making it more enthusiastic. The excitement of a production process means that producers will increase their production activities in order to meet excess demand. With increased production activities, more resources will be absorbed, one of which is labor (Mankiw, 2000) .
Meanwhile, in the concept of labor supply *,* the increasing number of the labor force causes the supply of labor in the labor market to also increase, which will cause labor wages to decrease. The decrease in labor wages causes labor demand *to* increase because labor, which is actually one of the production inputs, can be obtained at low wages (Ismei et al., 2015) . If the price of capital goods decreases, production costs will also decrease so that the price of goods produced per unit also decreases. This situation where the price of production goods is low causes demand in the market for these goods to increase so that it will increase the value of GRDP. Based on this analysis, the workforce has a positive influence on economic growth.
The results of this research are supported by research conducted by Novianto and Atmanti (2013) which found that the labor force partially had a positive effect on GRDP growth in Central Java Province (Novianto & Atmanti, 2013) . In this research, it was stated that if the labor force increases, the GRDP value in Central Java Province will also increase. However, research from Fahlewi (2020) states the opposite, that the labor force has a negative effect on GRDP growth in South Sumatra Province (Fahlewi et al., 2020) . In this research, it was stated that the labor force had a negative value due to the demand for the labor force in South Sumatra Province being unable to accommodate the excess supply of the labor force.

The Effect of Inflation On Gross Regional Domestic Product

The results of the regression state that inflation partially has a significant influence on gross regional domestic product, but the direction shown in the test is negative. This is shown by the $_{\text{calculated t value}}$ of 6.727 > than t $_{\text{table}}$ 1.677 and the significance value is smaller than 0.05, namely 0.000. Apart from that, the regression coefficient value shown by the *Unstandardized Coeficients Beta column* is -0.440, indicating that if the inflation variable increases by 1 percent, the GRDP value will decrease by 0.440 billion Rupiah. The results of this research show that Hypothesis 4: "Inflation has a positive and insignificant influence on GRDP in Bojonegoro Regency" is rejected.
Inflation in developing countries can be caused, among other things, by increasing production costs (*cost push inflation*). The condition that occurs when production costs

DOI: doi.org/xxxxxxxxxx

increase is that the supply of labor is limited but demand for production goods is high. This imbalance causes the price of production goods per unit available on the market to become expensive. In a production process, expensive production resource prices cause production output to also experience an increase in price per unit. Economic growth in conditions of *cost push inflation* like this will of course only reduce economic growth due to a decrease in the amount of production (Mankiw, 2000) . Increasing production costs is of course closely related to the concept of *purchasing power parity*. An increase in production costs which has an impact on increasing the price of production goods per unit causes demand for production goods to fall. The decrease in demand caused by expensive prices of manufactured goods makes companies reduce their production. The decline in production of goods from companies will then cause economic growth to decline in general (Madura, 2008) .

Based on the Solow-Swan model of economic growth theory, economic growth here only takes into account the number of goods produced and then calculated into currency as a form of alignment to obtain real value (Tarigan, 2014) . As time goes by changes in prices for production goods and services often occur so that economic growth is always based on current prices. The presence of inflation causes economic growth in nominal terms to increase, but productivity is still the same as before. This makes inflation have a negative influence on economic growth. Something similar to the results of this research was stated by Nadirin (2017) in his research which stated that inflation had a negative influence of 2.93% on economic growth in Indonesia (Nadirin, 2017) .

Not much different from research from Nadirin (2017), research conducted by Daniel (2018) which also states that inflation has a negative effect on the rate of economic growth in Jambi City (Daniel, 2018) . The research also states that a high inflation rate causes economic development and economic activity to slow down so that the rotation of the wheels of the economy will also slow down and ultimately economic growth will decline.

Conclusion

Based on the results of the analysis and discussion that researchers have carried out and discussed in the previous chapters, the research aims to determine the factors that influence GRDP. The independent variables used in this research are the Gross Enrollment Ratio, Life Expectancy Rate, and Total Labor Force and the Inflation variable is used as a control variable. The data in this research uses secondary data obtained from the official BPS website and several other official sites.

Based on the results of the Multiple Linear Regression Analysis and the explanation presented in the previous chapter, the following conclusions can be formulated.

There is a positive and significant influence that occurs between the Gross Enrollment Ratio variable and the Gross Regional Domestic Product variable in Bojonegoro Regency. This is caused by an increase in the Gross Enrollment Ratio which causes the ability and skills of the workforce to increase so that the productivity of the workforce also increases.

There is a negative and significant influence that occurs between the Life Expectancy variable and the Gross Regional Domestic Product variable in Bojonegoro Regency. This is due to an increase in the elderly population and a decrease in the birth rate which causes a

decrease in the support ratio, so that meeting the health and economic needs of the elderly population is borne by the productive population and will ultimately hamper economic growth.

There is a positive and significant influence that occurs between the Number of Labor Force variable and the Gross Regional Domestic Product variable in Bojonegoro Regency. This is caused by the abundant supply of labor making labor wages low, so that demand for labor increases in order to increase production. Low production input prices make the price of production goods per unit low, so that demand for production goods increases and in the end this will turn the regional economy around more quickly.

There is a negative and significant influence that occurs between the Inflation variable and the Gross Regional Domestic Product variable in Bojonegoro Regency. This is caused by an increase in inflation which causes people's purchasing power to become low, resulting in a decrease in demand for manufactured goods. Apart from that, an increase in the value of inflation makes the price of production inputs become expensive, resulting in an increase in production costs and in the end producers will decide to reduce their production expenditure and increase the price of production goods.

Based on the results of the analysis and discussion presented in the previous chapters, there are several suggestions for parties with authority, including the following.

The government, in formulating regional development policies, is expected to pay attention to factors that have a significant influence on economic growth. For factors that have a significant positive influence on economic growth, the government is expected to further improve these factors. Meanwhile, for factors that have a negative influence on economic growth, the government is expected to better address the causes, such as controlling the inflation rate so that there is no increase in production costs and preparing the elderly population to be able to meet their own needs so as not to burden the productive age population.

For society, it is hoped that individual skills and abilities will be further improved in order to increase personal productivity to contribute to economic growth. Apart from that, people are expected to be able to meet their own needs in old age so as not to burden the productive age population too much.

References

Adelakun, O. J. (2011). Human capital development and economic growth in Nigeria. *European Journal of Business and Management* , *3* (9), 29–38.

Affandi, M. (2009). Factors that Influence the Elderly Population's Choice to Work. *Journal of Indonesian Applied Economics* , *3* (2), 99–110.

Agustin, HU, Rianto, WH, & Kusuma, H. (2018). Analysis of the influence of capital and labor on the efficiency of roof tile production in Sukorejo Village, Gandusari District, Trenggalek Regency. *JIE Journal of Economics* , *2* (2), 194–205.

Akasumbawa, MD (2021). The Influence of Education, Life Expectancy and Population Number on Economic Growth in the Country with the Largest Population in the World. *Economic Research, Accounting And Taxation* , *2* (1).

Arif, MN (2014). *The Influence of Education on Gross Regional Domestic Income in Indonesia* . *3* (1).

Arikunto. (2006). *Research Procedures A Practice Approach* . PT Rineka Cipta.

Au, A. K. M., Altman, Y., & Roussel, J. (2008). Employee training needs and perceived value of training in the Pearl River Delta of China: A human capital development approach. *Journal of European Industrial Training* , *32* (1), 19–31.

Bhuono, AN (2005). *Effective Strategy for Choosing Statistical Research Methods with SPSS* . ANDI.

Boediono. (2018). *Introduction to Economics No. 2* . BPFE.

BPS. (2022). *Analysis of Indonesia's Population Profile* .

Budihardjo, A., Arianti, F., & Mas'ud, F. (2021). The Influence of Investment, Labor, and Human Development Index on GRDP (Case Study of Districts/Cities in Central Java Province 2016-2018). *Diponegoro Journal of Economics* , *9* (2), 1–9.

Daniel, P. A. (2018). Analysis of the influence of inflation on the rate of economic growth in Jambi City. *Economics: Journal of Economics and Business* , *2* (1), 131–136.

Fahlewi, R., Amri, RR, & Sari, AM (2020). Analysis of the Influence of Education Level, Labor Force and Government Expenditures on GRDP in South Sumatra Province. *Journal of Economics, Business and Accounting* , *4* (1), 354–363.

Ghozali, I. (2011). *Multivariate Analysis Application with the IBM SPSS 19 Program* . Diponegero University Publishing Agency.

Ghozali, I. (2018). *Multivariate Analysis Applications with the IBM SPSS 25 Program* (9th ed.). Diponegoro University Publishing Agency.

Gujarati, D. (2003). *Basic Econometrics: Sixth Edition* . Erlangga.

Hanapiah, A. (2011). *Analysis of Human Capital Investment from an Education and Training Perspective* .

Handayani, NS, Bendesa, I., & Yuliarmi, N. (2016). The Influence of Population, Life Expectancy, Average Years of Schooling, and GRDP Per Capita on Economic Growth in Bali Province. *Udayana University Journal of Economics and Business* , *5* (10), 3449– 3474.

Hepi, H., & Zakiah, W. (2018). The Influence of Life Expectancy Rate and Old School Rate on GRDP Per Capita and Economic Growth in Central Kalimantan Province 2011-2015:

The Influence of Life Expectancy Rate and Average Years of Schooling on GRDP Per Capita and Economic Growth in the Province. *Palangka Raya University Master of Economics Journal: GROWTH* , *4* (1), 56–68.

Heri, L., & Cicih, M. (2022). Elderly in the Era of Demographic Bonus. *Indonesian Population*

Journal , *17* (1), 1–14. https://doi.org/10.14203/jki.v17i1.636

Hikma, A., Ramadhani, S., Amalia, N., & others. (2019). The Influence of Educational Participation on Poverty Levels in Central Java Province. *Journal of Business Economics* , *18* (1), 1–7.

Indriyani, S. (2016). Analysis of the influence of inflation and interest rates on economic growth in Indonesia in 2005–2015. *Krisnadwipayana Business Management Journal* ,

4.2 .

Ismei, A., Wijarnako, A., & Oktavianti, H. (2015). Analysis of Labor Demand in Small and Medium Industries in Lamongan Regency 2009-2013. *Media Trends* , *10* (1), 75–89.

Kurniawati, E., & Sugiyanto, C. (2021). The Influence of Population Age Structure on Economic Growth in Indonesia. *Indonesian Journal of Economics and Development* , *21*

(1).

Madura, J. (2008). *International Financial Management* . Thomson.

Mankiw. (2000). *Macroeconomics* (6th ed.). Erlangga.

Marlina, S., & Pebrina, S. (2019). Analysis of the Influence of Investment Levels, Regional Original Income and Labor on the GRDP of Jambi Province. *Economics: Journal of Economics and Business* , *3* (1), 36–43.

Mulyadi. (2003). *Human Resource Economics* . Raja Grafindo Perkasa.

Nadirin, M. (2017). The Relationship Between Inflation and Economic Growth in Indonesia for the Period 1994.1-2013.4. *FEB Student Scientific Journal* , *5* (2).

Novianto, TF, & Atmanti, HD (2013). Analysis of the Influence of Original Regional Income, Investment and Labor Force on the GDP Growth of Central Java Province 1992-2011. *Diponegoro Journal of Economics* , *2* (2), 1–9.

Nurkholis, A. (2018). *Human Resource Development Theory: Human Capital Theory, Human Investment Theory, Human Development Theory, Sustainable Development Theory, People Centered Development Theory* .

Okunade, A., & Osmani, A. (2020). Effect of life expectancy on economic growth: new results using the flexible box-cox power transformation model. *Applied Economic Letters* , *27* (20), 2–4.

Panelewen, N., Kalangi, J.B., & Walewangko, E. (2020). The Influence of Domestic Investment and Labor Investment on Gross Regional Domestic Product (Pdrb) in Manado City. *Efficiency Scientific Periodical Journal* , *20* (01).

Prasetyia, F., Wulandari, F., & Hutama, RS (2011). Public Sector Expenditure, Economic Growth and Poverty in Indonesia. *Indonesian Journal of Economics and Development* , *11* (2), 99–116.

Puspasari, D. (2020). Analysis of the Influence of Education, Health and Wages on Labor Productivity in Central Java Province. *Journal of Development Economic Dynamics* , *3* (1), 65–76.

Rastogi, P.N. (2002). Knowledge management and intellectual capital as a paradigm of value creation. *Human Systems Management* , *21* (4), 229–240.

Ria, A., & Nurranto, H. (2016). Analysis of School Enrollment Rates and Highest Education Levels on DKI Jakarta Gross Regional Domestic Product Growth. *SOCIO-E-CONS* , *8* (2), 104–117.

Robbani, AS (2020). *Analysis of the Effect of Inflation, Exchange Rates, Interest Rates, Capital Structure, Asset Turnover, and Liquidity on the Profitability of PT Sekar Laut Tbk* .

Rosadi, D. (2011). *Econometrics and Applied Time Series Analysis with Eviews* (1st ed.). CV Andi Offset.

Shari, R.M., & Abubakar, J. (2022). The Influence of Population Growth, School Enrollment Rates and Labor Force Participation Rates on Economic Growth in 5 Provinces in Indonesia. *Unimal Journal of Regional Economics* , *5* (2), 20–32.

Sianturi, PL, Sihombing, SM, & Desmawan, D. (2022). Analysis of the Influence of Educational Participation Levels on Economic Growth in Riau Province. *Journal of Economics, Business And Management* , *1* (1), 156–163.

Sjafrizal. (2008). *Regional economics: theory and applications* . Baduose Media.
https://books.google.co.id/books?id=hb05oLQBneQC

Sugiyono. (2017). *Quantitative, Qualitative, and R&D Research Methods* . Alphabeta CV.

Sukirno, S. (2006). *Development economics: processes, problems and policy bases* (2nd ed.). Kencana.

Tarigan, R. (2014). *Regional Economics: Theory and Applications Revised Edition* . Literary Earth.

World Bank. (2016). *Live Long and Prosper: Aging in East Asia and the Pacific.*