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The Influence of Human Resource Technology and Productive Age on Economic Growth in NTB (2017-2022)

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A R T I C L E I N F O

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A B S T R A C T

The purpose of this study is to examine how human resources and productive age affect economic growth in NTB from 2017 to 2022. Quantitative research is the methodology employed. The type of data used in this study is secondary data gathered from books, journals, papers, theses and agency documents originating from the Central Statistics Agency (BPS) of NTB Province. The Eviews 12 program is utilized to handle the data, and panel data regression analysis using a Random Approach Effect Model is the data analysis technique employed. The study's findings suggest that the Independent Technology variable has no effect on economic growth on its own, as evidenced by its t-value of 1.5206 and likelihood of a technology variable of 0.138 or higher than α = 0.05 (0.138> 0.05). There is a significant impact of the Human Resources variable on economic growth, as indicated by its t-value of 4.7519 and probability of a Human Resources variable of 0.00 or less than α = 0.05 (0.00> 0.05). On the other hand, the Productive Age variable has a t-value of 7.9570 and probability of an economic growth variable of 0.00 or less than 0.05 (0.00> 0.05), indicating that the productive age variable has a significant impact on economic growth.

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INTRODUCTION

One of the primary metrics used to evaluate a region's progress is economic growth. With its varied natural resources, West Nusa Tenggara (NTB) Province is still working to boost economic expansion. NTB will have to overcome a number of obstacles between 2018 and 2022 in order to sustain steady economic growth.

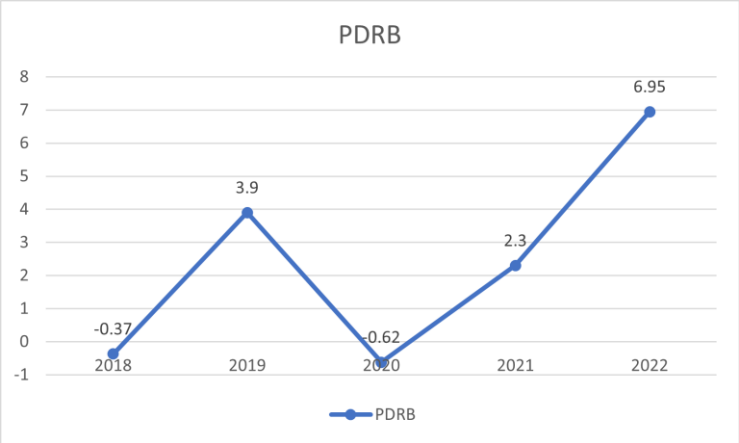
One of the most important elements, technology, has advanced quickly in recent years. Technology adoption throughout NTB's economic sectors is thought to have the potential to boost efficiency and production. Integrating the right technology is thought to rejuvenate important industries like small and medium businesses, tourism, and agriculture. To comprehend its effect on total economic growth, more research is necessary to determine the extent of technology adoption and usage in this province. One of the key elements influencing a region's economic growth is the rapid advancement of technology.

In the NTB economic growth equation, human resources (HR) are positioned as a decisive component as well. A thorough assessment of HR quality is required, as it is reflected in the population's health, education, and skill levels. The impact of the capacity building initiatives that the local government has put in place between 2018 and 2022 on raising worker productivity should be evaluated. In this research, demographic factors—particularly the productive age of the NTB population—cannot be disregarded. As a possible demographic bonus, the percentage of the population between the ages of 15 and 64 must be considered. To determine how much of this demographic potential has been used to propel economic growth, it is also necessary to examine the unemployment and labor force participation rates in this age group. Even while the productive age, the impact of technology, and the use of HR offer enormous growth potential, there are several obstacles that must be taken into account. Aspects that must be properly managed include the requirement for significant investments in technology development, the availability of suitable infrastructure, and the preparedness to enhance HR's adoption of new technologies.

It is impossible to overlook the COVID-19 pandemic's effects, particularly around 2020–2021. When analyzing economic growth, it is important to include the disruption caused by the epidemic, particularly to the tourism industry, which is one of NTB's mainstays. Thus, a thorough investigation is required to determine the degree to which elements like technological infrastructure development, investment in technology, enhancing the caliber of human resources, and utilizing the potential of productive age have impacted economic growth in NTB Province from 2019 to 2023 (Amri Yahya et al., 2024).

In relation to this, economic growth in NTB Province based on the economic growth rate can be seen in the following graph:

Graph 1.Gross Regional Domestic Product Growth Rate ADHK 2010 According to Business Field in West Nusa Tenggara Province (Percent) 2018-2022 Period



Source: Central Statistics Agency of NTB (2024)

The NTB Province's economic situation is depicted by the Gross Regional Domestic Product at Constant Prices (ADHK) 2010 data in graph 1.1 above. Between 2018 and 2022, the economy grew in a variety of ways. In 2018, economic growth was only -0.37 percent due to a fall in the mining and quarrying category. Then, in 2019, the economy grew by 3.90 percent. However, the COVID-19 pandemic caused economic growth to decline by -0.62 percent in 2020. Growth of 2.30 percent in 2021 marked the start of the recovery once more, and in 2022, it increased significantly to 6.95 percent (GRDP of NTB Province According to Business Field, 2018-2022).

As a result, NTB Province's economic growth is anticipated to keep rising. The government is optimistic that the utilization of technology, the contribution of productive age, and the function of human resources would all play a major part in propelling regional economic growth. The following table shows how technology, human resources, and productive age affected NTB Province's economic growth from 2018 to 2022:

Table 1. The Influence of Technology Users, Human Resources, and Productive Age on Economic Growth in NTB Province 2018-2022

Year	Number of Technology Users (%)	Human Resources (%)	Number of Productive Age (Soul)
2018	22.69	89.64	5,258,765
2019	23.63	90.86	4,955,578
2020	26.55	91.77	5,370,331
2021	27.87	93.75	5,405,385
2022	28.74	93.68	3,946.55

Source: Central Statistics Agency of NTB (2024)

Table 1.1 shows the influence of technology use, human resources, and the number of productive age in NTB Province during the period 2018 to 2022. In the table, it can be seen that the percentage of technology users has increased every year, starting from 22.69% in 2018 and reaching 28.74% in 2022. Meanwhile, the quality of human resources has also increased from 89.64% in 2018 to 93.68% in 2022, although it has decreased slightly in the last year compared to the previous year. However, what is interesting is the number of productive ages which has fluctuated. In 2018, the number of productive age was recorded at 5,258,765 people, then decreased in 2019 to 4,955,578 people, before increasing again in 2020 and 2021, to 5,370,331 people and 5,405,385 people, respectively. However, in 2022, there was a significant decline in the number of productive ages, with a total of 3,946,555 people. The data illustrates that the use of technology and the quality of human resources continue to increase, but the number of productive age is unstable and has experienced a significant decline in 2022.

THEORETICAL REVIEW

Theory of Economic Growth

Adam Smith's Theory (Classical)

Adam Smith emphasized the importance of the division of labor and the capital accumulation process. According to him, capital accumulation must be carried out first before the division of labor, so that work can be further divided in a balanced manner after the capital stock is enlarged, which is then followed by increased productivity. The direct effect of increasing the capital stock accompanied by an increase in labor will increase total output . The more inputs used, the greater the output produced.

A country's production system consists of three main elements, namely: a) available natural resources, b) population, and c) existing capital stock. Natural resources are a fundamental component in the production activities of society because the maximum limit of economic growth is determined by the availability of natural resources. The second element is the population, which in the process of output growth is considered to have a passive role, because the population will adjust to the labor needs of the community. Population growth will occur if the prevailing wage rate is higher than the subsistence wage , and vice versa. Labor wages are determined by the tug-of-war between the forces of demand and supply. Capital stock also has a direct and indirect influence on output . Capital affects output directly through an increase in capital accompanied by an increase in labor, while indirectly capital increases output through an increase in per capita productivity through specialization and division of labor.

According to Smith, the process of economic growth is cumulative. When prosperity arises in various sectors, this prosperity will encourage capital accumulation, technological progress, population growth, market expansion, division of labor, and continuous increase in profits. These profits are obtained from investments made by capital owners to maintain their capital in the business. This growth process will eventually reach a stationary position when the "upper limit" determined by the availability of natural resources is reached. At this point, capital growth, there are two important factors that support this

process, namely: market expansion and a level of profit that exceeds the minimum profit so that it can be invested (Ardiyansyah , M, 2023) .

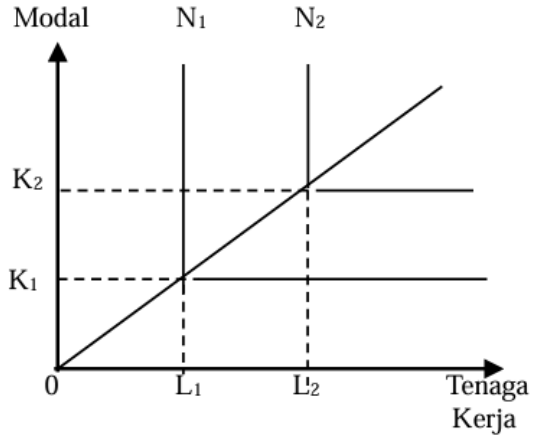
Solow (Neoclassical)

In 1956, Robert Solow, a neoclassical figure, developed the theory of economic growth analysis that relies on production elements like labor, capital accumulation, population, and the degree of technical advancement. According to this traditional approach, technology plays a significant influence in economic expansion. According to the Solow growth model, the capital-output ratio (COR) is flexible, allowing the economy to mix labor and capital to produce a given amount of production. The fundamental premise of this model is that capital will experience diminishing return. Lack of workforce expansion and technical advancement will cause the return on capital to decline to the point where new capital is only enough to replace depreciated capital, which will prohibit the economy from expanding.

Furthermore, raising the savings rate will only propel economic expansion until it reaches a stable state where the only factor influencing production growth per worker is technical advancement. As technology advances, the functions of production and savings will converge as well. As technological advancements lead to increases in output per capita, the steady state will eventually rise as well (Wahyuni et al., 2013). Donou-Adonsou (2017) also noted that employing high-quality technology can spur economic growth more quickly than enhancing the caliber of human resources alone. In the meantime, enhancing the caliber of human resources—which are crucial to the production process—also contributes significantly to economic expansion.

Harrod-Domar Theory

In capital formation, the role of supply and demand is considered a major factor. Investment is seen as having an important role in the economy because it increases the ability of a region to produce goods. According to the Harrod-Domar theory , capital investment made by the community at a certain time is used for two purposes: 1) replacing damaged capital equipment, and 2) increasing the number of capital equipment in the community. The additional production generated compared to capital investment will produce a capital-production ratio value (capital output ratio).



Source: Carlos, 2007

Figure 1. Harrod-Domar Production Function

The effective capacity increase of capital equipment (after deducting depreciation) can be formulated as:

$\Delta Ys = \delta . I$ ……...(1)

Where :

ΔYs = increase in effective capacity of new capital equipment

I = the amount of capital formation

δ = capital production ratio

Increased capital investment will cause an increase in national income which is influenced by the size of the multiplier . The relationship between the increase in national income (ΔYd) and the increase in capital investment (ΔI) can be expressed as:

$Yd = 1/\alpha . \Delta I$

In addition , the level of economic growth of a society is determined by the saving ratio (s) and capital. output (v).

Previous Research

Research conducted by (Lucya & Anis, 2019) examines the Influence of Technology and Education on Economic Growth in Indonesia. The model used in this study is multiple linear regression. The results of this study indicate that the level of education has a positive influence on Indonesia's economic growth and technology is also found to have a positive influence on the level of economic growth in Indonesia. The similarities between the research conducted by Lucya and Anis and this study lie in the independent variable, namely technology. While for the research, it lies in the object of research where Lucya and Anis ' research analyzes in Indonesia while this study analyzes in NTB Province. And the research conducted by Lucya and Anis does not use Time series , while this study uses the 2018-2022 time series.

Research conducted by (Theresia Oktavia, 2020) examines the Analysis of the Influence of Information and Communication Technology (ICT) and Education on Economic Growth. The model used in this study is panel data regression analysis. The results of this study indicate that economic growth is positively and significantly influenced by technology and education. Based on this, it can be concluded that every increase in education and technology also has an impact on increasing economic growth. The similarity of the research conducted by Theresia Oktavia lies in the independent variables, namely economic growth and technology and lies in the analysis method, namely using panel data analysis. While the difference lies in the object of the research, namely where Theresia Oktavia conducted research in Indonesia while this research was conducted in NTB Province. The difference also lies in Time The series used by Theresia Oktavia is not specific, while this research uses a time series, namely 2018-2022.

Research conducted by (Amri Yahya, Muhammad Arif Pohan, 2024) examines the Analysis of the Influence of Technology on Economic Growth in Medan City in 2020-2023. The method used in Amri Yahya and Muhammad Arif Pohan's research is multiple linear regression analysis. The results of the study show that investment in technology and human resources in the technology sector has a positive and significant influence on the economic growth of Medan City, while technological infrastructure does not have a significant influence. The difference lies in the variables analyzed by Amri Yahya and Muhammad Arif Pohan, namely in the Independent variable, namely Technology, while this study uses three variables, namely technology, human resources and productive age and lies in the object of research, namely Medan City, the data analysis method used is multiple linear regression. And Time The series used is Amri Yahya's research with a time series of 2020-2023, while this research is 2018-2022.

Research conducted by (Rahmadani Putri, Idris, 2020) examines the Influence of Information and Communication Technology on the Labor Market and Economic Growth in Indonesia. The models used are Simultaneous Equations (ILS) and OLS through the CEM, FEM and REM models and continued with classical trials. The difference in Rahmadani Putri and Idris' research lies in the object of their research, namely in Indonesia, while this research is in NTB Province. The research conducted by Rahma Putri and Idris did not use time series while this study uses a time span of 2018-2022. Then the variables analyzed by Ramadhani Putri and Idris are the influence of ICT while this study uses independent variables, namely technology, human resources, and productive age.

METHODOLOGY

Finding the influence or relationship between two or more variables is the goal of this study's quantitative research using an associative research approach. (Sugiyono , 2022). Secondary data for the 2018–2022 timeframe was gathered from government reports, official organizations like the NTB Central Statistics Agency (BPS), and other pertinent sources. The number of people in the productive age range, the quality of human resources (such as educational

attainment), technical advancements, and the NTB Province's GDP are all included in this statistics.

Technology users, human resources (HR), and productive age are the independent variables in the panel data regression analysis used to test the previously developed hypothesis. The dependent variable is the GDP. Regression model estimate, the traditional assumption test, the hypothesis test, and determination coefficient analysis are the components of panel data analysis.

Panel Data Regression Model

Log(Yit) = α + LogX1it + LogX2it + LogX3it + e

Information:
Log = Logarithm
α = Constant
Y = Growth Rate (%)
X1 = Internet User Technology (%)
X2 = Human Resources (Year)
X3 = Productive Age (people)
e = Error

Before selecting the right model for the variables to be studied, it is necessary to estimate the model to be selected. Research in panel data uses three models, namely Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) employing the Langrange test multiplier (LM), Hausman test, and Chow test. Because each variable has the same number of time units and there are 60 observations based on the study's starting observations, the panel data in this study is balanced. One of the three panel data regression models will be chosen as the best model, and it will thereafter be utilized for hypothesis testing and determination coefficient testing (R^2). Version 12 of the Eviews software is used to process the acquired data.

RESEARCH RESULT

Regression Analysis Model

Panel Data Regression Model Selection

Results estimate with third model, that is Common Effect Model (CEM), Fixed Effect Model (FEM) And Random Effect Model (BRAKE), Next, the model is used to conduct a model selection test. panel data. Which tests are used are Chow test, Houseman test and Lagrange Multiplier (LM) test. As for model Which set based on result of third test the is Random Effect Model (BRAKE) Which can be seen on Table 4.5 below:

Table 2. Results of Chow Test and Houseman Test

Test Chow	
Cross Chi- square section	0.0026
Decision	< 0.05

Model Selected	FEM
Test Houseman	
Cross section Random	0.0000
Decision	< 0.05
Model Selected	FEM
Lagrange test multiplier (LM)	
Breusch -Pagan (Both)	0.0000
Decision	< 0.05
Selected Models	BRAKE

Source: Processed Results Data with Eviews version 12

The following are the steps involved in testing model selection:

1. The Chow test seeks to determine which of the CEM and FEM model estimates is the best. The Hausman test can be performed since the chosen model is FEM, according to the Chow test findings, which show that 0.0025 < 0.05.
2. Between FEM and REM, the Hausman test seeks to determine which model estimate is superior. The FEM model is employed based on the Hausman test results, which show that 0.0000 < 0.05.
3. Between CEM and REM, the Lagrange test multiplier (LM) seeks to determine the optimal model estimate. The REM model is employed based on the Lagrange test multiplier results, where 0.0000 < 0.05.

Panel Data Regression Model Estimation

From the results of panel data regression calculations with model specification testing, the best model obtained was Random Effect Model (REM). The results of the data processing can be seen in table 4.6 as follows:

Table 3. Regression Results Panel Data Random Effect Model (REM)

Dependent Variable: Y
Method: Panel EGLS (Cross-section random effects)
Date: 01/21/25 Time: 15:09
Sample: 2017 2022
Periods included: 6
Cross-sections included: 6
Total panel (balanced) observations: 36
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-41.08329	8.738671	-4.701320	0.0000
LOGX1	0.000618	0.000407	1.520669	0.1382
LOGX2	4.176442	0.878887	4.751966	0.0000
LOGX3	0.031832	0.004000	7.957028	0.0000

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	3.323511	1.0000

Weighted Statistics			
R-squared	0.722496	Mean dependent var	3.399444
Adjusted R-squared	0.696480	S.D. dependent var	5.750418
S.E. of regression	3.168056	Sum squared resid	321.1706
F-statistic	27.77125	Durbin-Watson stat	2.194869
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.722496	Mean dependent var	3.399444
Sum squared resid	321.1706	Durbin-Watson stat	2.194869

Source: Processed Results Data with Eviews version 12

Based on the results of panel data regression using the Random Approach Effect Model (REM) obtained the following equation:

Log(Y) = -41.083 + 0.0006 Logx1 + 4.176 Logx2 + 0.0318 Logx3 + e

Information:
Log = Logarithm
α = Constant
Y = Growth Rate (%)
X1 = Internet User Technology (%)
X2 = Human Resources (Year)
X3 = Productive Age (people)
e = Error

The interpretation of the model is as follows :

a. The constant value (α) of 41.08% shows that if all independent variables, namely Technology (Log X1), Human Resources (Log X2), and Productive Age (Log X3), are zero, then the value of the GRDP variable (Log Y) is 41.08%.
b. The coefficient value of the Technology variable (Log X1) is positive at 0.0006. This indicates a unidirectional relationship. This means that if the Technology variable (Internet Users) (Log X1) increases by 1 percent, then the GRDP variable (Log Y) will increase by 0.06 percent, assuming other variables are constant (fixed).

c. The coefficient value of the Human Resources variable (Log X2) is positive at 4.17. This value indicates a unidirectional relationship. This means that if the Human Resources variable (Average Length of Schooling) (Log X2) increases by 1 year, then the GRDP variable (Log Y) will increase by 4.17 percent, assuming other variables are constant.
d. The coefficient value of the Productive Age variable (Log X3) is positive at 0.0318. This value indicates a unidirectional relationship. This means that if the Productive Age variable (Log X3) increases by 1 person, the GRDP variable (Log Y) will increase by 3.18% percent, assuming other variables are constant (fixed).

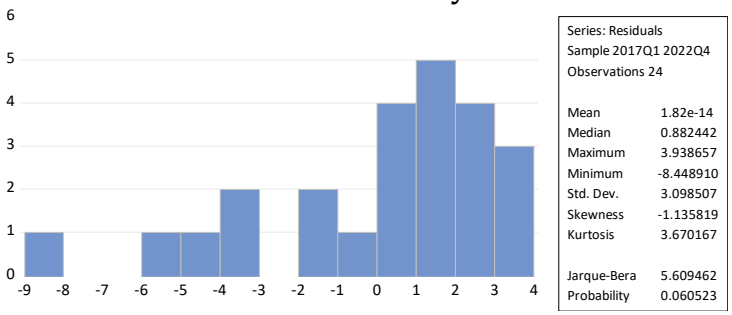
Classical Assumption Test

The panel data regression model applied in this study is the Random model. Effect Model with Ordinary approach Least Square (OLS). Therefore , the classical assumption test used in panel data regression with the OLS approach in this study is as follows :

Normality Test

Normality test is used to determine whether the data obtained comes from a population that has a normal distribution or not, because a good regression model is one that has a normal distribution. The normality test is basically not a requirement for BLUE (Best Linear Unbiased Estimator or Best Estimator, Linear, and Unbiased), and some opinions also do not require this requirement as something that must be met. However, because the use of the F test and t test requires the error factor to follow a normal distribution (Ghozali , 2021), the normality test is still carried out in this study. The results of the normality test are:

Table 4. Normality Test



Source: Data Processing Results with Eviews version 12

Normality test is seen from the P-Value Jarque-Bera or Probability value where in this study is 0.0605 > 0.05. Thus, it can be explained that the data used is normally distributed and can be carried out for further testing.

Multicollinearity

Multicollinearity test is carried out to test whether the regression model finds a correlation between independent variables (Ghozali , 2021) . A good

regression equation is one that does not have a correlation between independent variables or is said to be free from multicollinearity . The results of the multicollinearity test can be seen in the following table:

Table 5. Multicollinearity Test

Variance Inflation Factors
Date: 01/22/25 Time: 13:23
Sample: 2017Q1 2022Q4
Included observations: 36

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	109.9273	238.9538	NA
LOGX1	2.92E-07	16.41630	1.796365
LOGX2	1.171158	125.4728	1.588555
LOGX3	2.07E-05	9.068782	1.768338

Source: Data Processing Results with Eviews version 12

From the results of the multicollinearity test above can be seen based on the VIF value of each independent variable is <10 then it is stated that there is no multicollinearity .

Heteroscedasticity

Heteroscedasticity test is carried out to test whether in a regression model occurs inequality variance from residual a observation to other observations (Ghozali , 2021) . A good model is a model that does not experience heteroscedasticity . The results of the heteroscedasticity test can be seen in the following table:

Table 6. Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.425060	Prob. F(3,20)	0.7372
Obs*R-squared	1.438497	Prob. Chi-Square(3)	0.6965
Scaled explained SS	1.333690	Prob. Chi-Square(3)	0.7211

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/22/25 Time: 13:25
Sample: 2017Q1 2022Q4
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	65.26500	50.38616	1.295296	0.2100
LOGX1	-0.002445	0.002598	-0.941108	0.3579
LOGX2	-5.245964	5.200753	-1.008693	0.3252
LOGX3	-0.019222	0.021871	-0.878864	0.3899

R-squared	0.059937	Mean dependent var	9.200717
Adjusted R-squared	-0.081072	S.D. dependent var	15.35793
S.E. of regression	15.96835	Akaike info criterion	8.530106
Sum squared resid	5099.761	Schwarz criterion	8.726448
Log likelihood	-98.36127	Hannan-Quinn criter.	8.582195
F-statistic	0.425060	Durbin-Watson stat	2.214215
Prob(F-statistic)	0.737152		

Source: Data Processing Results with Eviews version 12

From the results of the heteroscedasticity test using the Breusch -Pagan Godfrey test above can be seen based on the Chi-Square Probability value on Obs * R-squared using the dependent variable RESID, which means that after adjustments are made by removing one observation sample, it is stated that the value is > 0.05, indicating that there is no heteroscedasticity .

Autocorrelation Test

Autocorrelation test aims to test whether in a linear regression model there is a correlation between the disturbance error (residual) in period t with the disturbance error in period t-1 (previous). Autocorrelation testing can use the LM Test . The data from the autocorrelation test results can be seen in the following table:

Table 7. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.373381	Prob. F(2,18)	0.6936
Obs*R-squared	0.956021	Prob. Chi-Square(2)	0.6200

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/22/25 Time: 13:27
Sample: 2017Q1 2022Q4
Included observations: 36
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.009670	10.90696	-0.092571	0.9273
LOGX1	-1.52E-05	0.000565	-0.026894	0.9788
LOGX2	0.096261	1.123420	0.085685	0.9327
LOGX3	0.001023	0.004849	0.211023	0.8352
RESID(-1)	-0.098295	0.234969	-0.418334	0.6807
RESID(-2)	-0.196325	0.248804	-0.789077	0.4403

R-squared	0.039834	Mean dependent var	1.82E-14
Adjusted R-squared	-0.226879	S.D. dependent var	3.098507
S.E. of regression	3.432048	Akaike info criterion	5.516509
Sum squared resid	212.0211	Schwarz criterion	5.811023
Log likelihood	-60.19811	Hannan-Quinn criter.	5.594644
F-statistic	0.149352	Durbin-Watson stat	2.012459
Prob(F-statistic)	0.977627		

Source: Data Processing Results with Eviews version 12

Based on the results in the table above, the Autocorrelation test can be seen based on the Probability Chi-Square value on Obs * R-squared using the dependent variable RESID, which means that after adjustments are made by eliminating one observation sample which then states that the value is > 0.05, it shows that there is no autocorrelation .

Statistical Test t

The t-test is used to determine how much influence each independent variable has on the dependent variable (Ghozali , 2021) . The data results from the t-statistic test in this study can be seen in the following table:

Table 8.Results of the T-Statistic Test (Partial)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-41.08329	8.738671	-4.701320	0.0000
LOGX1	0.000618	0.000407	1.520669	0.1382
LOGX2	4.176442	0.878887	4.751966	0.0000
LOGX3	0.031832	0.004000	7.957028	0.0000

Source: Data Processing Results with Eviews version 12

Each independent variable's t-count value and probability value are displayed in the table above. Additionally, the interpretive one-way hypothesis test with a significance level of 0.05 or 5% was used in this investigation. Therefore, the following explanation of the hypothesis can be proven:

1. Technology (X1)

   The technology variable (X1) has a computed t value of 1.5206 with a probability of the technology variable of 0.138 > 0.05, according to the regression coefficient test with a significance level of 5% (0.05). This indicates that the technology variable has a partially positive but negligible impact on the GDP variable (Y).
2. Human Resources (X2)

   The human resources variable (X2) has a calculated t value of 4.7519 with a probability of 0.00 < 0.05, indicating that it has a partially positive and significant influence on the GRDP variable (Y) according to the regression coefficient test conducted with a significance level of 5% (0.05).
3. Productive Age (X3)

   The productive age variable (X3) has a computed t value of 7.9570 with a probability of 0.00 < 0.05, indicating that it has a partially positive and significant influence on GRDP (Y) according to the regression coefficient test with a significance level of 5% (0.05).

F Statistic Test

The F test is used to determine how much the independent variables together influence the dependent variable (simultaneously). In this study, it is based on the Probability value (F- statistic) of the results of data processing with Fixed regression. Effect Model and by using the F table value of 2.479 where the significance value is 0.05 or 5% with a $df_{1\ value}$ of 4 and a $df_{2\ values}$ of 85. Where the data from the F Statistics test results can be seen in the following table:

Table 9.Results of F Statistic Test (Simultaneous)

Weighted Statistics			
R-squared	0.722496	Mean dependent var	3.399444
Adjusted R-squared	0.696480	S.D. dependent var	5.750418
S.E. of regression	3.168056	Sum squared resid	321.1706
F-statistic	27.77125	Durbin-Watson stat	2.194869
Prob(F-statistic)	0.000000		

Source: Data Processing Results with Eviews version 12

Based on the results of data processing, the probability value (F- statistic) is 0.000000 < 0.05 or based on the calculated F value > F table (27.771 > 2.479) so that the independent variables consisting of Technology (X1), Human Resources (X2) and Productive Age (X3) together influence the dependent variable in this case, namely GRDP (Y).

Coefficient of Determination Test

Coefficient determination (R^2) aiming For measure how much Far the abilities of the model to explain the variation of the dependent variable . As for The results of the data from the analysis of the coefficient of determination ($R2$) in this study can seen on the following table :

Table 10. Results of Determination Coefficient Test

R-squared	0.722496	Mean dependent var	3.399444
Adjusted R-squared	0.696480	S.D. dependent var	5.750418
S.E. of regression	3.168056	Akaike info criterion	5.248553
Sum squared resid	321.1706	Schwarz criterion	5.424499
Log likelihood	-90.47395	Hannan-Quinn criter.	5.309963
F-statistic	27.77125	Durbin-Watson stat	2.194869
Prob(F-statistic)	0.000000		

Source: Data Processing Results with Eviews version 12

Based on the table, the value of the coefficient of determination or R2 is based on the results of the regression with Random Effect Model, namely the value Adjusted R-squared (if using > 1 independent variable where in this study uses 3 independent variables) is 0.696 which means that the variables Technology (X1), Human Resources (X2) and Productive Age (X3) are able to explain the influence on the GRDP variable (Y) of 0.696 or 69.6 percent. While the remaining 30.6 percent is influenced by variables outside the model.

DISCUSSION

The Influence of Technology (X1) on Economic Growth (GRDP)

Based on the results of hypothesis testing, the technology variable represented through internet users shows that technology has a positive but insignificant influence on GRDP in NTB Province. This study is in line with research conducted by Winey and Siregar (2019) which states that technology has

a positive but insignificant influence on economic growth. In addition, Setiawan & Wijaya (2019) in their study also revealed that comprehensive adoption of technology can increase business efficiency and economic competitiveness, although its implementation takes time.

This shows that although technology contributes to economic growth, its application in NTB Province is still not optimal. Factors such as limited supporting infrastructure, low digital literacy , and lack of technology training for the community are the main obstacles. According to Nasution et al. (2021), increasing digital literacy and technological infrastructure is a strategic step that can strengthen the influence of technology on GRDP. By increasing public access to technology and providing adequate training, the influence of technology on GRDP is expected to be more significant in the future.

The Influence of Human Resources (X2) on Economic Growth (GRDP)

Based on the results of the hypothesis research test, the human resource variable represented by the average length of schooling, shows that HR has a positive and significant influence on PDRB in NTB Province. This research is consistent with the research conducted by Suswita et al. (2020) who stated that the quality of human resources has a significant influence on economic growth. In addition, Manurung & Halim (2020) in their research stated that education as the main element of human resources can increase the contribution to GRDP by increasing work productivity.

Quality human resources can increase productivity, efficiency, and innovation in various economic sectors. According to Todaro & Smith (2020), investment in education and training is the main key in creating human resources that can support economic development. In the context of NTB Province, improving the quality of human resources can be done through the provision of equitable education, training based on labor market needs, and empowering local communities. Thus, the contribution of human resources to GRDP can continue to increase.

The Influence of Productive Age (X3) on Economic Growth (GRDP)

The results of the hypothesis test show that the productive age variable represented by the number of the workforce, shows that the productive age has a positive and significant influence on the GRDP in NTB Province. This study is in line with research conducted by Sugiarto (2019) which states that the productive age population makes a significant contribution to economic growth. Bloom et al. (2007) stated that the demographic bonus can be utilized to increase economic growth if accompanied by supportive policies.

The productive age population is the backbone of the economy because they are the main source of labor that plays a role in increasing productivity. According to Firdaus et. al. (2020), the utilization of the demographic bonus must be done by providing appropriate employment, providing skills training, and ensuring access to health facilities. In the context of NTB Province, optimizing the demographic bonus can be one of the main strategies to increase GRDP, as long as it is supported by appropriate and sustainable policies.

CONCLUSIONS

Based on the results of the discussion in this proposal, the researcher draws the following conclusions:

1. The Technology variable (X1) has a positive and significant influence on economic growth in NTB Province. Increasing technology adoption, especially in the agricultural, industrial, and tourism sectors, drives production efficiency and increases competitiveness. Investment in technological infrastructure and workforce training to master digital technology are key to accelerating economic growth. Digitalization of micro-businesses and the use of e-commerce also play a role in increasing the productivity of the local economic sector.
2. Human Resources (X2) variable has a positive and significant influence on economic growth in NTB Province. Better quality of human resources, marked by increasing levels of education and skills of the workforce, increases productivity and innovation in the business world. Workforce capacity building programs through vocational training and education contribute to better workforce absorption. Therefore, investment in the education and health sectors is a strategic step in increasing regional economic growth.

The Productive Age variable (X3) has a positive and significant influence on economic growth in NTB Province. The demographic bonus owned by NTB Province, with a dominant productive age population, provides great potential in driving economic growth. However, to maximize this potential, policies are needed that support job creation, improving workforce skills, and entrepreneurship programs that encourage productive age people to play an active role in the economic sector.

RECOMMENDATIONS

1. The factors analyzed in this study are a small part of the various aspects that influence economic growth , so that further research can add others variables such as investment , fiscal policy , and economic infrastructure to get broader results.
2. This study uses a five-year time span, so it is recommended for further researchers to extend the research period in order to get more comprehensive analysis of economic growth trends in NTB Province .

FURTHER STUDY

This research has been conducted in accordance with scientific procedures, but has several limitations. The factors that influence economic growth in this study consist of only three variables, namely technology, human resources, and productive age. In addition, this study uses data over a five-year period (2018-2022), which may not be enough to capture the dynamics of economic growth in the long term.

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