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IDEAL
Vol. 1, No. 2 (2025)

Original Article

The Influence of the Composite Indicator of the Human Development Index on Economic Growth in West Nusa Tenggara Province 2013 – 2023

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This article contributes to:

Abstract. This study investigates the relationship between economic growth and human development indicators in West Nusa Tenggara Province during the period of 2013–2023. Using a quantitative descriptive approach, the research utilizes secondary time series data collected through library research and documentation techniques from official institutions. The variables include Economic Growth (dependent) and four independent variables representing the dimensions of the Human Development Index (HDI): Life Expectancy, Average Years of Schooling, Expected Years of Schooling, and Per Capita Expenditure. Multiple linear regression analysis, supported by classical assumption tests and statistical evaluations (t-test, F-test, and adjusted R^2), is employed to examine the data. The results indicate that, both partially and simultaneously, the HDI components do not have a significant effect on economic growth, suggesting an indirect relationship. The findings highlight the need for policy interventions that enhance the economic sector's value-added potential to promote job creation and improve HDI in the region.

Keywords: Economic Growth, Human Development Index, Life Expectancy, Education, Per Capita Expenditure, West Nusa Tenggara.

1. Introduction

Development is a conscious, planned, and sustainable process that covers various dimensions of people's lives, both social, economic, and environmental [1]. Essentially, development can be understood as a systematic effort made by humans to transform conditions of balance that are considered less than optimal into new conditions that are better and more sustainable. The main goal of the development process is to achieve prosperity that is evenly distributed across all levels of society [2]. In developing countries, the focus of development is generally directed at improving the standard of living and welfare of the community, which often confronts two main orientations: growth and equity. In practice, the issue of economic growth is the main focus as an indicator of development success [3].

Economic growth itself is defined as a positive change in the production capacity of a country or region in a certain period, which is usually measured by the percentage change in national income or Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP) [4]. GRDP specifically describes the ability of a region to create added value from economic activities in a certain period, and is the main indicator in assessing regional economic performance [5].

Article info
Revised: 2025-4-23
Accepted: 2025-5-20
Publish: 2025-5-28

In the context of measuring human welfare, the United Nations Development Programme (UNDP) developed the Human Development Index (HDI) which reflects development achievements in three basic dimensions: long and healthy life (life expectancy at birth), knowledge (literacy rate, average length of schooling, and expected length of schooling), and a decent standard of living represented by people's purchasing power [6]. The HDI is an important indicator because it empirically shows a close relationship between the quality of human development and the potential for long-term economic growth. People's income, one of which is shown through GRDP per capita, is one of the determining factors of welfare. The higher the per capita income of a region, the greater the potential for increasing the welfare of its population, both in terms of education, health, and consumption. This increase in income is believed to be able to create more jobs and expand access to basic services, which will indirectly encourage an increase in the HDI [7].

West Nusa Tenggara (NTB) Province, which consists of 8 districts and 2 cities in the Lesser Sunda Islands region, is one of the provinces that continues to strive to improve its development achievements. Although consisting of more than 280 islands with two main islands—Lombok and Sumbawa—this province has been ranked 26th in terms of national HDI achievement for the past decade [8]. Based on data from the NTB Province BPS, the rate of economic growth in this region showed significant fluctuations in the period 2013–2023, with a sharp decline in 2018 and 2020 due to the impact of the Covid-19 pandemic. However, efforts to gradually recover the economy have shown positive results, reaching growth of 1.8% in 2023. In 2019, the construction and manufacturing sectors recorded the highest growth among other sectors.

On the other hand, NTB's Human Development Index shows a consistent increasing trend from year to year. In 2023, NTB's Human Development Index reached 72.37, a significant increase compared to previous years although it was still below the national average (72.29). This achievement was supported by improvements in all dimensions of the Human Development Index, including increasing life expectancy, average length of schooling, and per capita expenditure reflecting a decent standard of living. The 2020–2023 period is an important momentum in the recovery and strengthening of human development indicators in NTB post-pandemic [9]. This study aims to analyze the relationship between economic growth and the Index.

2. Method

This study uses a quantitative descriptive approach that aims to describe and analyze the relationship between human development indicators and economic growth in West Nusa Tenggara Province during the period 2013–2023 [10]. Descriptive research is conducted to provide a factual and accurate picture of the phenomenon being studied, without manipulating the existing variables. Meanwhile, a quantitative approach is used because the entire data analysis process is carried out numerically, utilizing statistical data obtained through documentation techniques and literature studies [11]. This method is also based on a positivistic paradigm that emphasizes the principles of objectivity, rationality, systematicity, and can be tested empirically.

This research was conducted in the West Nusa Tenggara Province with a data coverage of ten years, namely from 2013 to 2023. Data collection was conducted in 2024–2025. The selection of this research location was based on the condition of the Human Development Index (HDI) in NTB which is consistently ranked low nationally, so a deeper study is needed regarding the factors that influence it. Data collection techniques are carried out through two main approaches. First, library research, namely the activity

of reading, recording, and processing various library sources that are relevant to the research. Second, documentation, namely the collection of secondary data that has been published by official agencies, such as HDI data and economic growth rates from the Central Statistics Agency (BPS), Health Office, Education Office, and Bappenas.

The type of data used in this study is secondary data in the form of time series. This data is obtained from official and documented sources, so researchers do not need to collect primary data directly [12]. The variables used in this study consist of dependent and independent variables. The dependent variable in this study is Economic Growth (Y) which is measured through the increase in real Gross Regional Domestic Product (GRDP) from year to year. Meanwhile, the independent variables include three main dimensions of the HDI, namely Health which is measured through Life Expectancy (X1), Education which is measured through Average Years of Schooling (X2) and Expected Years of Schooling (X3), and Standard of Living which is measured by Per Capita Expenditure (X4).

The operational definition of the variables in this study is as follows: Economic Growth (Y) is measured in percent (%) based on the annual real GRDP change. Health (X1) is measured through Life Expectancy expressed in years. Education is represented by Average Years of Schooling (X2) and Expected Years of Schooling (X3), both also expressed in years. Standard of Living (X4) is measured through Per Capita Expenditure in rupiah (Rp). To analyze the relationship between these variables, the multiple linear regression analysis method is used. The analysis model used is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \qquad (1)$$

Where YYY is Economic Growth, X1 to X4 are independent variables, β0\beta_0β0 is a constant, β1 to β4 are regression coefficients, and eee is the error term. This analysis is assisted by EViews 12 software. Before conducting the regression test, a Classical Assumption Test is conducted to ensure that the regression model meets the validity criteria, namely: (1) Multicollinearity Test to identify the presence of correlation between independent variables using the VIF value, (2) Normality Test to check the distribution of residuals using the significance test, (3) Autocorrelation Test with the Durbin-Watson Test to detect relationships between residuals sequentially in time series data, and (4) Homoscedasticity Test to ensure that the residuals have constant variance throughout the range of predicted values.

After the classical assumptions are met, a statistical test is carried out which includes: (1) Partial Test (t-Test) to determine the influence of each independent variable on the dependent variable individually, (2) F-Test to determine the influence of all independent variables simultaneously on the dependent variable, and (3) Determination Coefficient (Adjusted R^2) to measure how large a proportion of the variation in the dependent variable can be explained by the independent variables in the model.

3. Results and Discussion

3.1 The Relationship between Economic Growth and Life Expectancy

According to Coque et al. [13] define health economics as the application of economic theory, concepts and techniques to the health sector, so that health economics is closely related to the allocation of resources among various health efforts, the amount of resources used in health services, the organization and financing of various health services, the efficiency of allocation and use of various resources and the impact of prevention, treatment and health recovery efforts on individuals and society.

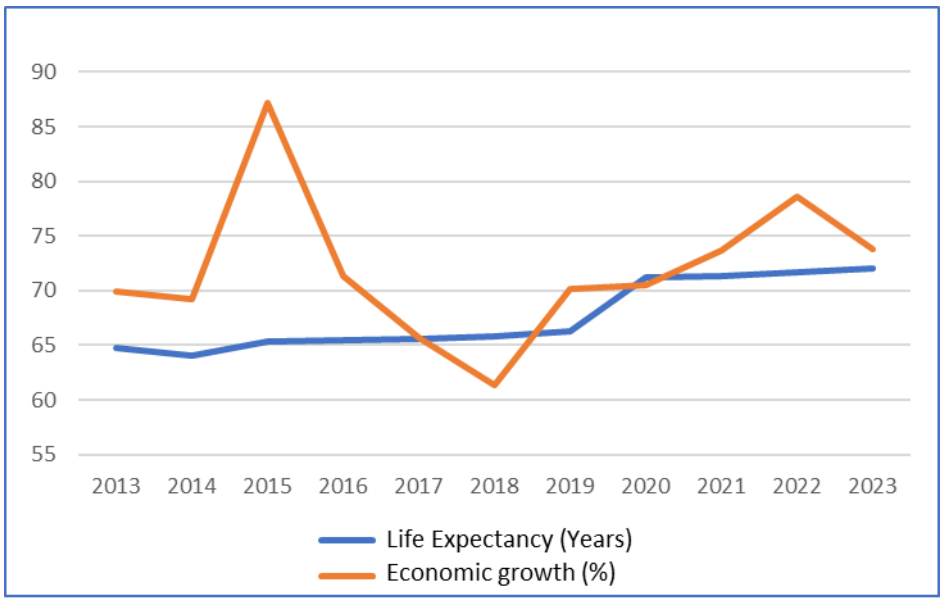

Figure 1. Economic Growth Rate and Life Expectancy of NTB Province 2013 - 2023

3.2 The Relationship between Economic Growth and Average Years of Schooling and Expected Years of Schooling

Economic growth is an increase in output per capita in the long run. In this sense, the theory must include the theory of GDP and the theory of population growth [14]. The level of education is a long-term process that uses systematic and organized procedures, in which managerial workers learn conceptual and theoretical knowledge for general purposes. The basic measure of the level of education is the previous year. The development is always expressed in the form of a percentage change in national income in a given year compared to the previous year.

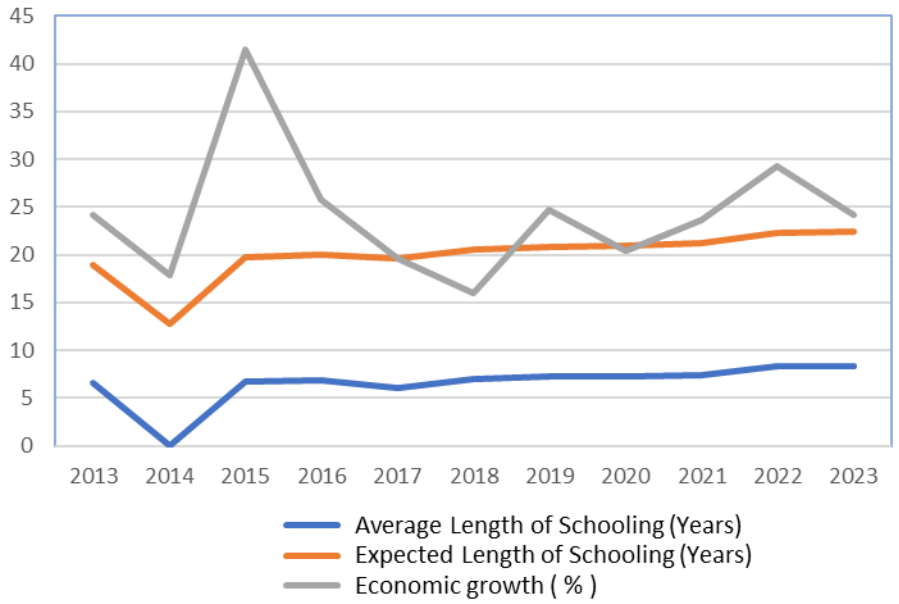

Figure 2. Average Length of Schooling, Expected Length of Schooling and Economic Growth Rate of NTB Province 2013 - 2023

3.3 The Relationship between Economic Growth and Per Capita Expenditure

Per capita expenditure is used to measure human living standards. This is also influenced by knowledge and opportunities to realize knowledge in various productive activities so as to produce output in the form of goods or services as income. Then the existing income creates expenditure or consumption. Per capita expenditure provides an overview of the level of purchasing power PPP (Purchasing Power Parity) of the

community, and as one of the components used in viewing the status of human development in a region [15].

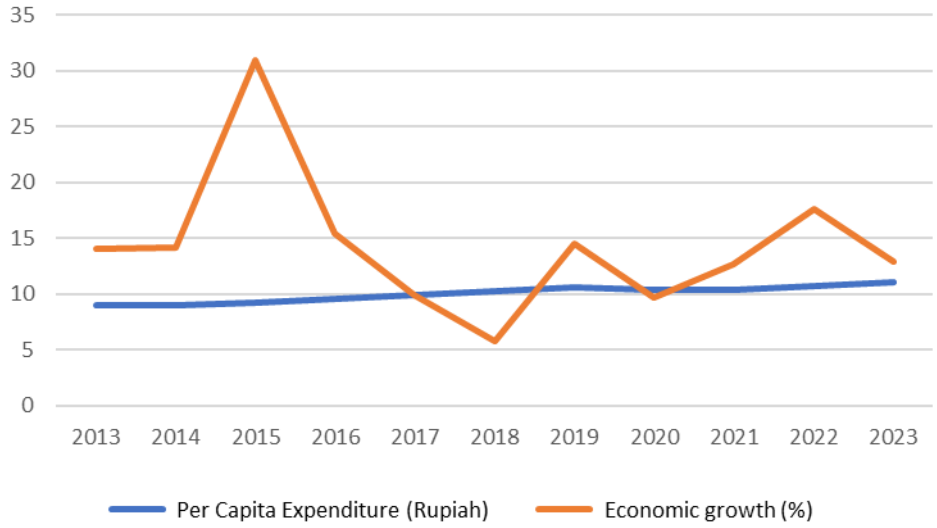

Figure 3. Per Capita Expenditure and Economic Growth of NTB Province 2013 – 2023

3.4 Multiple Linear Regression Analysis

The constant value (B0) is 15.263, meaning that if the independent/dependent variables, namely Life Expectancy (X1), Average Length of Schooling (X2), Expected Length of Schooling (X3), Per Capita Expenditure (X4) are 0, then the economic growth rate variable is 15.263 Percent (%). The regression coefficient value of the Life Expectancy variable (X1) is 0.381. If the number of Life Expectancies increases by 1%, Economic Growth will increase by 0.4%.

Table. 1. Multiple Linear Regression Result Analysis

Model	Unstandar.Coeff.		Standar. Coeff.	t	Sig.	Collin. Stat.		Durbin Watson
	B	Std.Error	Beta			Tol.	VIF	
C	15.263	99.037		0.154	0.883	-	-	-
X1	0.381	1.454	0.182	0.262	0.802	0.260	3.842	2.005
X2	0.001	0.001	0.202	5.00	0.632	0.786	1.273	
X3	3.503	15.606	0.263	0.224	0.830	0.091	8.950	
X4	-8.298	9.037	-0.907	-0.91	0.394	0.129	7.772	

$$Y = 15.263 + 0.381(X_1) + 0.001\ (X_2) + 3.503\ (X3) - 8.298 + e$$

The regression coefficient value of the Expected Years of Schooling variable (X2) is 0.001, if the number of Expected Years of Schooling is 1% then Economic Growth will increase by 0.1%. The regression coefficient value of the Expected Years of Schooling variable (X3) is 3.508, if the number of Expected Years of Schooling increases by 1% then Economic Growth will increase by 3.5%. The regression coefficient value of the Per Capita Expenditure variable (X4) is -8.298, if the number of Per Capita Expenditure increases by 1% then Economic Growth will decrease by -8.3%.

3.5 Assumption Test Results

The normality test aims to test whether in a regression model, the dependent variable and the independent variable have a normal distribution or not [16]. If the probability value is greater than the error degree value, which is α = 0.05, then this study has no problems or in other words, the data is normally distributed. Conversely, if the probability value is smaller than the error degree value, which is α = 0.05, then in this study there is a normality problem or in other words, the data is not normally distributed.

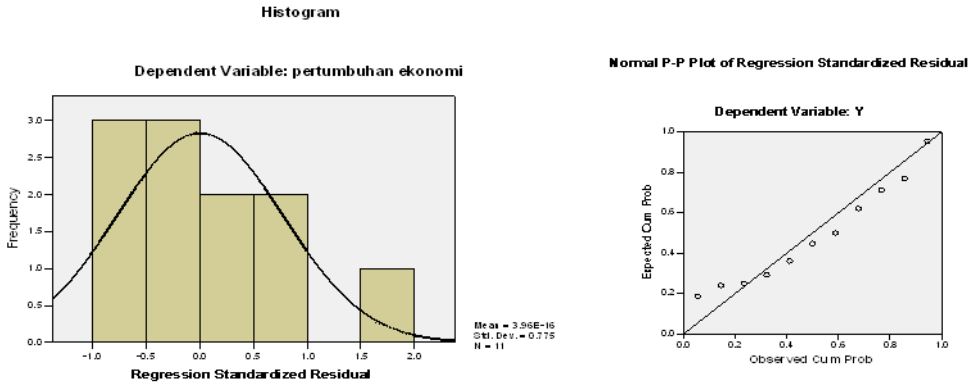

Figure 4. Normality Test Results

Based on the Kolmogorov-Smirnov test, a significance value of 0.775 > 0.05 was obtained, meaning that the results of the Normality test research were normally distributed. Based on table 1, the results obtained from the multicollinearity test show that the VIF values of all independent variables are <10, so it can be concluded that there is no multicollinearity problem between independent variables in the regression model. The heteroscedasticity test aims to determine whether in the model, the residual has a constant variance or not. A good regression model must be homoscedastic (the variance of the residual is constant). The residual has a constant variance or cannot be detected by the Heteroscedasticity test, if Obs*R-square is found to be more than 0.05, it can be concluded that there is no heteroscedasticity.

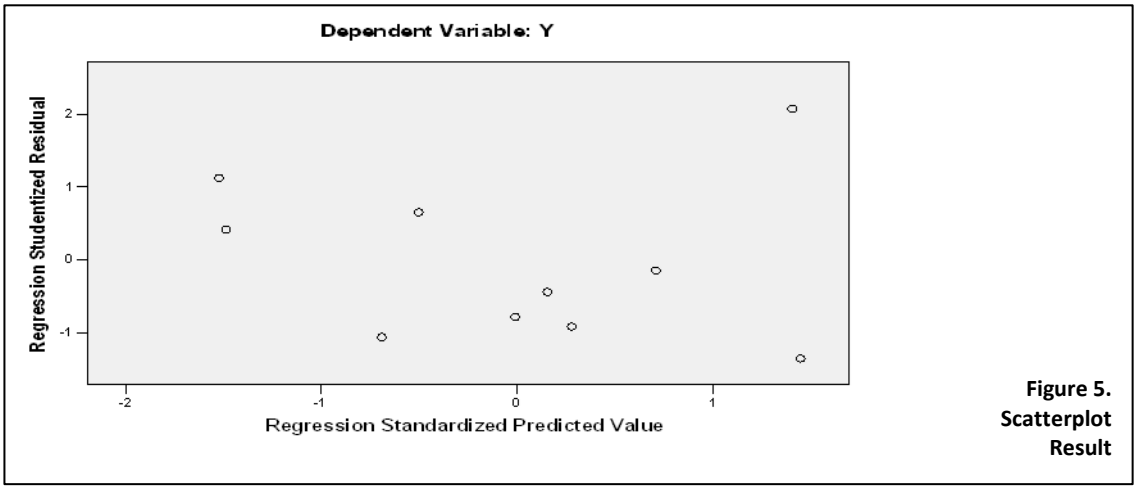

Figure 5. Scatterplot Result

Based on the scatterplot results, it can be seen that the points are spread randomly and do not form a certain pattern such as tapering, spreading curved, or forming a certain line. This random distribution indicates that the residual variance is constant, or in other words, there is no heteroscedasticity in the regression model. Autocorrelation Test Results used the Durbin-Watson test. The results showed a Durbin-Watson value of 2.005, which is within the ideal value range of 1.5 to 2.5. Thus, it can be concluded that there is no autocorrelation in this regression model.

3.6 Hypothesis Test Results

By testing the Regression coefficient using = 5% (0.05), the Life Expectancy variable has a t-count value of 0.262 with a significant value of 0.802> 0.05, then H0 is accepted and H1 is rejected, meaning that the Life Expectancy variable does not have a significant effect on Economic Growth in West Nusa Tenggara. By testing the Regression coefficient using = 5% (0.05), the Expectancy of School Years variable has a t-count value of 5.00 with a significant value of 0.632> 0.05, then H0 is accepted and H2 is rejected, meaning that

the Expectancy of School Years variable does not have a significant effect on Economic Growth in West Nusa Tenggara. By testing the Regression coefficient using = 5% (0.05), the Average Years of Schooling variable has a t-count value of 0.224 with a significant value of 0.830> 0.05, then H0 is accepted and H3 is rejected, meaning that the Average Years of Schooling variable does not have a significant effect on Economic Growth in West Nusa Tenggara. By testing the Regression coefficient using = 5% (0.05), the Life Expectancy variable has a t-count value of -0.907 with a significant value of 0.394> 0.05, then H0 is accepted and H4 is rejected, meaning that the Life Expectancy variable does not have a significant effect on Economic Growth in West Nusa Tenggara.

Table 2. ANOVA Result

Model	Sum of Squares	df	Mean Square	F	Sig.	R^2
Regression	110.118	4	27.529	493	0.743	0.247
Residual	334.304	6	55.884			
Total	445.421	10				

Based on the results of data processing, the calculated F value is 0.493 with a significance value (Sig.) of 0.743. The significance value is greater than 0.05 (0.743 > 0.05), so it can be concluded that the regression model is not statistically significant. This means that simultaneously or together, variables X1, X2, X3, and X4 do not have a significant effect on variable Y. Based on the results of the study above, the R Square value of 0.497 was obtained, which indicates the level of relationship (correlation) between the independent variables (X1, X2, X3, and X4) to the dependent variable (Y). This means that the R Square (R^2) value of 0.247 indicates that 24.7% of the variation that occurs in the Y variable can be explained by the variables X1, X2, X3, and X4 together, while the remaining 75.3% is explained by other factors outside the model.

3.7 Discussion

3.7.1 The Influence of the Health Sector on Economic Growth

Health as measured by Life Expectancy Rate affects Economic Growth. Good health in the population can increase labor productivity, which in turn can increase economic growth. However, population health does not always have a significant effect on economic growth due to various factors, including poor economic conditions, lack of access to health services, and poor environmental factors. In addition, uncontrolled population growth can also be an obstacle to economic development, because more and more needs must be met with limited resources [17]. Not in line with the theory put forward, based on the results of multiple linear regression and hypothesis testing which show that the Life Expectancy variable does not have a significant and positive effect on Economic Growth in West Nusa Tenggara Province. In other words, the level of public health is only one factor in increasing economic growth. The results of this study are supported by research conducted by Esen and Çelik Keçili [18] which revealed that the health index variable does not have a significant and positive effect on economic growth.

3.7.2 The Influence of Education on Economic Growth

The Education Index measured by Expected Years of Schooling and Average Years of Schooling has an impact on increasing Economic Growth [19]. The length of time a population has been educated has an impact on economic growth because education increases human capital, which means increasing the skills, knowledge, and ability of individuals to work productively. This in turn increases labor productivity, innovation, and economic competitiveness. Not in line with the theory put forward, based on the results of multiple linear regression and hypothesis testing which show that the variables Expected Years of Schooling and Average Years of Schooling do not have a significant and positive effect on Economic Growth in West Nusa Tenggara Province. In other words, the

level of community education is only one factor in increasing economic growth. The results of this study are supported by research conducted by Guzel et al. [20] which revealed that the education and health index variables do not have a significant and positive effect on economic growth.

3.7.3 The Influence of Per Capita Expenditure on Economic Growth

The standard of living of the population affects economic growth because a better standard of living creates conditions that are more conducive to economic growth. People with a better standard of living have higher economic capacity, which in turn encourages consumption, investment, and productivity, thereby increasing economic growth. The standard of living of the population does not always significantly affect economic growth because economic growth is often more determined by other factors, such as investment, technology, and the quality of human resources. An increase in population without increasing quality and productivity can actually be a burden on the economy, while uneven economic growth can increase income inequality and does not automatically increase the standard of living of all residents.

Not in line with the theory put forward, based on the results of multiple linear regression and hypothesis testing which show that the Per Capita Expenditure variable has a negative and insignificant effect on Economic Growth in West Nusa Tenggara Province. In other words, the level of community expenditure is not a factor in increasing economic growth in West Nusa Tenggara Province. The results of this study are supported by research conducted by Ghifara et al. [21] which revealed that there was no significant effect of per capita expenditure on economic growth in East Java Province.

4. Conclusion

Based on the discussion, the author concludes as follows: (a) partially Life Expectancy, Expected Years of Schooling, Average Years of Schooling, do not have a significant and positive effect on Economic Growth in West Nusa Tenggara Province in 2013-2023, it is suspected that it has an indirect effect on the variables. Partially Per Capita Expenditure does not have a significant and negative effect on Economic Growth in West Nusa Tenggara Province in 2013-2023, it is suspected that it has an indirect effect on the variables. Simultaneously Life Expectancy, Expected Years of Schooling, Average Years of Schooling, and Per Capita Expenditure do not have a significant effect on Economic Growth in West Nusa Tenggara Province in 2013-2023, it is suspected that it has an indirect effect on the variables. It is hoped that the West Nusa Tenggara Provincial Government will be able to further increase the value added of each economic sector to support economic growth so as to further increase the absorption of labor more positively and significantly to increase the NTB Province's Human Development Index (HDI).

5. Acknowledgments

I would like to extend my sincere gratitude and appreciation to NTB Government for it invaluable contributions and support throughout this research endeavour. Her dedication, insights, and expertise have been instrumental in shaping the outcomes of this study. I am deeply thankful for her guidance, encouragement, and unwavering commitment to excellence, which have significantly enriched the quality and depth of this research.

6. Declaration

Author contributions and responsibilities - The authors made major contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

Funding - This research did not receive external funding.

Availability of data and materials - All data is available from the author.

Competing interests - The authors declare no competing interests.

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