



## Research Paper

# Analysis of The Influence of Regional Income and Expenditure and Human Development Index on Economic Growth in The District / City of Aceh Province

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## Abstract

### Artikel Info

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This study aims to analyze the effects of Regional Revenue, Regional Expenditure, and the Human Development Index (HDI) on Economic Growth (Non-Oil and Gas GRDP) in 23 regencies/municipalities of Aceh Province during the period 2017–2023. A quantitative approach with panel data regression was employed, combining time series and cross-sectional data. The best estimation model was selected through Chow, Hausman, and Lagrange Multiplier tests. The findings reveal that, partially, Regional Revenue, Regional Expenditure, and HDI have a positive and significant impact on regional economic growth. Simultaneously, the three independent variables significantly influence economic growth, with a coefficient of determination ( $R^2$ ) of 76,9%. This indicates that 76,9% of the variation in economic growth is explained by the model, while the remaining 23,1% is influenced by other factors beyond the scope of this study. These results highlight the importance of strengthening regional revenue, ensuring efficient government spending, and enhancing human capital development to promote sustainable economic growth in Aceh. The study contributes to regional economic literature and provides valuable insights for policymakers in designing fiscal and development strategies, while also serving as a reference for future research.

**Keywords:** Regional revenue; Regional expenditure; Human development index

## 1. Introduction

In Aceh province, development efforts have been made through various programs financed by local revenue and government spending. In addition, improving the quality of human resources reflected in the Human Development Index (HDI) is also an important factor in promo-



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ting sustainable economic growth. High levels of the Human Development Index will affect economic growth through the ability of people to contribute more in increasing their productivity and creativity [1]. Regional revenues derived from local revenue (PAD), balance funds, and others, have an important role in Financing Regional Development. On the other hand, local government spending reflects the extent to which fiscal policy is directed to support productive sectors [2]. Meanwhile, HDI reflects human development achievements in terms of health, education, and people's purchasing power, which in theory have a close relationship with productivity and economic growth.

Empirically, government spending is considered as the implementation of the role or government intervention in improving the economic welfare of the community [3]. Meanwhile, local financial resources owned and obtained by local governments need to be allocated effectively and efficiently for regional development. The allocation of financial resources aims to increase economic growth which is expected to increase as well as improve the welfare of the community [4]. According To R.A. Chalit (2023) quoted from the APBD article is a concrete form of the regional finance work plan that presents the receipts and expenditures of local governments in the form of money to achieve certain goals in a budget year. Regional revenue and expenditure budget is a government work plan expressed quantitatively, usually in monetary units that reflect the sources of regional revenues and expenditures to finance regional activities and projects within one fiscal year, which is expected to reflect the needs of the community by taking into account the potential diversity of Regions owned [5].

Economic growth is defined as the process of increasing per capita output in the long term. Economic growth is emphasized on three main aspects, namely process, per capita output and long term. Economic growth can be measured through an increase in Gross Regional Domestic Product (GRDP) which reflects the economic performance of a region. Economic growth is the increase in economic value in an area from period to period. Economic growth is also an indicator of successful economic development in an area [6].

Economic development refers to the financial improvement that occurs in the process of producing goods and services. Developments in a country include increased industrial production and infrastructure development. Development of facilities and infrastructure as well as the development of the service sector and the increasing consumption of prestigious goods. A measure usually used to indicate how much economic growth an economy has achieved can be measured by how quickly its national income grows [7]. Government spending is the main instrument of fiscal policy that serves to increase people's purchasing power, accelerate infrastructure development, and support inclusive economic growth in the region [8]. Law Number 1 of 2022 on financial relations between the Central Government and local governments (HKPD law). This law aims to improve the efficiency and effectiveness of regional spending management through performance-based optimization of transfers to Regions (TKD). Human Development Index (HDI) is an indicator that shows the development, especially in the development of human resources. To support the implementation of development requires qualified human resources in addition to the fulfillment of the quantity of labor demand [9].

## 2. Method

### 2.1 Research approach

The type of data used in the study is panel data and data processed using Eviews 12. The study was conducted in Aceh province with all districts totaling 23 districts / cities in Aceh province for the period 2017-2023.

## 2.2 Data sources

Source data obtained from Aceh province published by the Central Bureau of Statistics. In addition, the data used is time series data with cross section from 2017-2023.

## 2.3 Data analysis techniques

To determine the effect of the dependent variable on the Independent, the panel data regression model is used with the following equation Agus, 2017 [10]:

$$Y = a + b1X1it + b2X2it + b3X3it + e$$

Where:

Y = economic growth

A = constant

b1, b2, b3 = regression coefficients

X1 = government revenue

X2 = government spending

X3 = Human Consumption Indeks

e = error term

i = Kabupaten/Kota

t = time period

## 3. Results and Discussion

### 3.1 Uji descriptif the F-test description

Descriptive statistics are methods related to the collection and presentation of a data set so as to provide useful information [11].

**Tabel 1. Descriptive Statistical Results**

	Y	X1	X2	X3
Mean	3.060435	1293.093	1173.565	72.22019
Median	3.570000	1190.530	1085.780	71.89000
Maximum	12.54000	2803.840	2068.970	88.32000
Minimum	-4.810000	598.2500	598.2500	62.88000
Std. Dev.	3.565862	489.8125	339.5184	5.131267
Skewness	-0.134812	0.975932	0.764558	0.706809
Kurtosis	2.731033	3.203948	2.871673	3.239958
Jarque-Bera	0.972979	25.83628	15.79589	13.79164
Probability	0.614781	0.000002	0.000372	0.001012
Sum	492.7300	208188.0	188943.9	11627.45
Sum Sq. Dev.	2034.459	38386606	18443637	4212.785
Observations	161	161	161	161

Source: data processed with Eviews 12

General description of the variables used in the study. Economic growth (non-oil and gas GRDP) has an average value (mean) of 3.060435. The Maximum value is 12.54000. The smallest value (minimum) of -4.810000. And the value of the standard deviation of 3.565862. The average value of regional income amounted to 1293,093. The largest value of 2803,840. The smallest value of 598.2500 and the standard deviation of 489.8125. The average value of regional shopping amounted to 1173,565. The largest value of 2068,970. The smallest value is equal to 598.2500. And the value of the standard deviation of 339.5184. The average value of Human Development Index

is 72.09596. The largest value of 88.32000. The smallest value of 62.88000. And the value of the standard deviation of 5.155863.

### 3.2 Selection of the best models

Determine the best method among the three calculation methods that have been done. Here are the test results of the model. Chow test is used to compare between Common Effect and Fixed Effect [12].

**Table 2. Chow test results**

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.202607	(22,135)	0.0032
Cross-section Chi-square	49.379893	22	0.0007

Source: data processed with Eviews 12

The probability of a Chow test of 0.0032 is less than a 0.05, so the null hypothesis is rejected, thus the best model of the Chow Test is the Fixed Effect.

### 3.2 Hausman test

The hausman test is performed if the chow Test shows a probability value smaller than 0.05. The hausman test compares between fixed and random effects [13].

**Table 3. Hausman test results**

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.1837181	3	0.0481

Source: data procesed with Eviews 12

The probability of the hausman test obtained a value of 0.0481 is smaller than a 0.05 so that the null hypothesis is rejected, thus the best model of the Hausman test is the Fixed Effect.

### 3.3 Langrange multiplier test

LM test is a statistical method to choose the most appropriate panel data regression model between Common Effect model and Random Effect model [14].

**Table 4. Langrange multiplier test**

Null (no rand. effect)	Cross-section	Period	Both
Alternative	One-sided	One-sided	
Honda	2.731724 (0.0032)	-1.221409 (0.8890)	1.067954 (0.1428)
King-Wu	2.731724 (0.0032)	-1.221409 (0.8890)	0.181879 (0.4278)
SLM	3.007752 (0.0013)	-1.043854 (0.8517)	-- --
GHM	-- --	-- --	7.462318 (0.0091)

Source: data processed with Eviews 12

From the above LM test results show the probability value of  $0.0032 < 0.05$ . Thus, from the results of testing Chow, Hausmann, and LM can be concluded that the best model for this study is the Fixed Effect Model.

### 3.4 Fixed effect regression

Model Based on the results of previous tests, the best model is a Fixed Effect method, so this study uses a Fixed Effect method. This study in accordance with research [15].

**Table 5. Fixed effect**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-96.98846	9.901518	-9.795313	0.0000
LOGX1	16.88560	1.734418	9.735598	0.0000
LOGX2	4.382561	1.566401	2.797854	0.0059
LOGX3	18.62994	6.671852	2.792319	0.0060
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.768736	Mean dependent var		3.060435
Adjusted R-squared	0.725909	S.D. dependent var		3.565862
S.E. of regression	1.866861	Akaike info criterion		4.233246
Sum squared resid	470.4980	Schwarz criterion		4.730864
Log likelihood	-314.7763	Hannan-Quinn criter.		4.435299
F-statistic	17.94990	Durbin-Watson stat		2.244651
Prob(F-statistic)	0.000000			

Source: data processed with Eviews 12

The results of the fixed effect test on the realization of regional income probability is 0.0000 less than a 0.05 which means that regional income has a positive and significant effect on economic growth. In regional spending value of 0.0059 is smaller than a 0.05 which means that regional spending has a positive and significant effect on economic growth. In the HDI value of 0.0060 is smaller than a 0.05 which means HDI has a positive and significant effect on economic growth. And the result of R-squared is 0.768736. Persamaan regresi:  $Y_{it} = 0.768736 + 16.88560X_{1it} + 4.382561X_{2it} + 18.62994X_{3it} + e_{it}$ .

### 3.5 Coefficient of determination

The value of the coefficient of determination is equal to 0.768736, which means that the independent variable consisting of regional income, regional expenditure, Human Development Index is able to explain the effect of the dependent variable, namely Non-oil and gas GRDP economic growth of 76.9% while the remaining 23.1% is explained by other variables outside the model.

### 3.6 Statistical test F

F test was conducted to determine whether all variables together affect the dependent variable or not [16].

**Table 6. Uji F-Test**

F-statistic	17.94990
Prob(F-statistic)	0.000000

Source: data processed with Eviews 12

Based on the test results that have been done, there is a statistical F value of 17.94990. with a probability of  $0.000000 < 0.05$ , thus rejecting  $H_0$  and accepting  $H_a$ , so it can be concluded that regional income, regional expenditure, HDI together have a significant effect on economic growth (non-oil and gas GRDP) districts/cities in Aceh province.

### 3.7 Statistical test t

The T-test is a statistical test used to test whether the difference in the responses of two groups is statistically significant or not [17].

**Table 7. T Test**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-96.98846	9.901518	-9.795313	0.0000
LOGX1	16.88560	1.734418	9.735598	0.0000
LOGX2	4.382561	1.566401	2.797854	0.0059
LOGX3	18.62994	6.671852	2.792319	0.0060

Source: data processed with Eviews 12

From the regression results in the table above it can be seen that the variable regional income in the fixed effect model shows the probability value of 0.0000 is smaller than a 0.05 then  $H_0$  rejected and  $H_1$  accepted means a significant effect on the economic growth of non-oil and gas GRDP. Variable regional expenditure in the fixed effect model shows the probability value of 0.0059 is smaller than a 0.05 then  $H_0$  rejected and  $H_1$  accepted which means a significant effect on the economic growth of non-oil and gas GRDP. The HDI variable in the fixed effect model shows that the probability value of 0.0060 is smaller than a 0.05, so  $H_0$  is rejected and  $H_1$  is accepted, which means that it has a significant effect on Non-oil and gas GRDP economic growth.

Based on the tests that have been carried out, the probability of the realization of regional income is 0.0000 with a coefficient of 16.88560, where regional income has an influence on the economic growth of non-oil and gas GRDP District/City of Aceh province. It is estimated that every increase of 1 unit in regional revenue will increase economic growth (non-oil and gas GRDP) by 16,88560 percent. Then it affects economic growth. This is in accordance with research conducted by [18] with the title " analysis of the effect of government spending, Tenga work, and local revenue on Regional economic growth of East Java Province in 2010-2015", where local revenue has a significant effect on economic growth. Regional income has a significant influence on economic growth, especially on the increase in non-oil and gas Gross Regional Domestic Product (GRDP). This is because local revenues, both from local taxes, levies, and transfer funds from the central government, are the main source of development financing in the region. With adequate revenue, local governments can build infrastructure that supports economic activities such as roads, markets, irrigation, and other public facilities, which directly support the growth of non-oil and gas sectors such as agriculture, processing industry, trade, and services.

The Effect Of Regional Expenditure Realization On Economic Growth In Aceh Regency / City  
Based on the results of tests that have been conducted, the probability of regional spending is

0.0059 with a coefficient of 4.382561, where regional spending has a significant effect on economic growth (non-oil and gas GRDP) districts/cities in Aceh province. It is estimated that every 1 unit increase in regional spending will increase economic growth by 4.382561 percent. Then it affects economic growth. These results are in accordance with research conducted by [19] with the title " analysis of the influence of Local Government capital expenditure, absorbed Labor and Human Development Index on economic growth and poverty (Case Study of 35 districts/cities in Central Java province)". This happens because regional spending is used for infrastructure development, education, and public services that encourage productivity and economic activity.

Based on the results of regression testing that has been done, the probability of HDI is 0.0060 with a coefficient of 18.62994, where HDI has an influence on economic growth (non-oil and gas GRDP) in the Regency/city of Aceh province. It is estimated that every 1 unit increase in HDI will increase economic growth by 18.62994 percent. Then it affects economic growth. This is in accordance with research conducted by [20] with the title " analysis of the influence of regional spending and Human Development Index on the economic growth of districts and cities in Bolanang Mongondow Raya". This happens because the Human Development Index (HDI) reflects the quality of life of the community which includes aspects of education, health, and purchasing power. When HDI increases, it means that people have better access to education and health services, as well as higher purchasing power.

#### **4. Conclusions and Implications**

Based on the results of the research that has been done, there are the following conclusions:

1. Regional income variables have a positive and significant influence on economic growth (non-oil and gas GRDP) in the districts/cities of Aceh province. It is estimated that every 1 unit increase in regional revenue realization will increase economic growth (non-oil and gas GRDP) by 16.89%.
2. Variable regional spending has a positive and significant effect on economic growth (non-oil and gas GRDP) in the District/City of Aceh province. It is estimated that every 1 unit increase in regional spending will increase economic growth by 4.38%.
3. Variable HDI has a positive and significant influence on economic growth (non-oil and gas GRDP) in the District/City of Aceh province. It is estimated that every 1 unit increase in HDI will increase economic growth by 18.63%. Overall (simultaneous variables) it can be concluded that regional income, regional expenditure and Human Development Index have a positive and significant influence on economic growth (non-oil and gas GRDP) in districts/cities in Aceh province. The implication of this study is to local governments to focus more on increasing local revenue, local spending and HDI for the benefit of increasing economic growth.

#### **5. Recommendations**

Based on the results of research on the influence of regional income, regional expenditure, and Human Development Index (HDI) on economic growth in Aceh province, there are three strategic recommendations that need to be implemented. First, local governments are advised to optimize local revenue (PAD). Second, regional spending should be strategically directed at the productive sector. Third, increasing HDI is a priority through policies that focus on the quality of education, equitable distribution of health services, etc.

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### **Authors' contributions and responsibilities**

Ainisyfak: conceptualization, methodology, investigation, formal analysis, visualization, and writing – original draft. Yuliana: supervision and writing – review & editing. Isthafan Najmi: supervision and writing – review & editing. Yuni Ayu Safitri: supervision and writing – review & editing.

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### **Availability of data and materials**

All data are available from the authors.

### **Competing interests**

The authors declare no competing interest.

### **Additional information**

No additional information from the authors.

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