

The Influence of Local Taxes, Local Government Expenditure, Investment, and the Human Development Index (HDI) on Economic Growth in the Barsela Aceh Region

Novia Ramdhani¹ Novia¹, Sri Rosmiati Sani², Mutiara Shifa³

¹²³ Universitas Teuku Umar, Indonesia

Correspondence e-mail: srirosmiatisani@utu.ac.id

WhatsApp Number: 081368156133

Article history Abstract

Submitted: 2026/10/03; Revised: 2026/10/05; Accepted: 2026/10/09

This study aims to analyze the effects of local taxes, regional expenditure, investment, and the Human Development Index (HDI) on economic growth in the Southwest (Barsela) region of Aceh Province. The study employs a quantitative approach using panel data that combine time-series data for 2011–2025 and cross-sectional data from eight regencies/cities, yielding a total of 120 observations. The data were obtained from the Directorate General of Fiscal Balance of the Ministry of Finance of the Republic of Indonesia and Statistics Indonesia. The analysis uses panel-data regression, with model selection based on the Chow, Hausman, and Lagrange Multiplier tests. The final model is the Common Effect Model (CEM). Because heteroskedasticity was detected, hypothesis testing uses White cross-section robust standard errors. The results show that local taxes have a positive but insignificant effect, regional expenditure has a negative but insignificant effect, investment has a positive and significant effect, and HDI has a negative and significant effect on economic growth. Simultaneously, the four variables have a significant effect. The adjusted R-squared value of 0.085746 indicates that the model explains 8.57% of the variation in economic growth, while the remaining 91.43% is explained by factors outside the model.

Keywords

economic growth; human development index; investment; local expenditure; local taxes

© 2026 by the authors.

Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY SA) license.

INTRODUCTION

Fiscal decentralization grants regency/city governments broader authority to manage regional revenue and expenditure sources. In the context of development, this authority makes fiscal capacity, expenditure quality, investment, and human

development important components of regional economic dynamics. Economic growth is used as an indicator of development performance because it reflects changes in a region's real capacity to produce goods and services through developments in Gross Regional Domestic Product (GRDP) at constant prices. In the Southwest (Barsela) region of Aceh Province, this issue is relevant because the eight regencies/cities differ in fiscal capacity, economic structure, resources, and regional characteristics.

The Barsela region examined in this study comprises Aceh Jaya, Aceh Barat, Nagan Raya, Aceh Barat Daya, Aceh Selatan, Aceh Singkil, Subulussalam City, and Simeulue. Nova's thesis indicates that economic growth in this region fluctuated during 2021–2025. Growth increased through 2023 and then declined in 2024 and 2025. Clear differences among regencies/cities also indicate that local fiscal capacity and economic structures are not uniform. This condition provides an important rationale for jointly examining factors associated with economic growth using panel data.

Local taxes are one source of Regional Original Revenue (PAD) that can strengthen local governments' capacity to finance public services and development. Theoretically, increased regional revenue can expand fiscal space, but its impact on economic growth depends on the government's ability to manage and allocate that revenue. Studies cited in the thesis report mixed findings. Mina et al. (2020), Alpad (2022), and Utami and Masyitah (2023) discuss the relationship between tax revenue or PAD and economic growth, while Pratama (2019) found a positive relationship between local taxes and economic growth in regencies/cities in Aceh Province. Differences in research settings, periods, and variables leave room for further testing in Barsela.

Regional expenditure is a government instrument for providing public goods and services, implementing development, and supporting public services. From the perspective of endogenous growth, government spending can affect growth through infrastructure, education, health, and public-service provision. However, the size of expenditure does not automatically indicate its impact on growth when its composition and effectiveness differ. Sari (2018), Juwari et al. (2016), Munir and Mahdar (2016), and Vellia and Mildawati (2021) show that the relationships among fiscal capacity, expenditure, and growth may vary according to regional context and expenditure type.

Investment is the allocation of capital expected to increase production capacity, create employment opportunities, and expand economic activity. In endogenous growth theory, capital accumulation is one factor supporting growth. Barsela has potential in agriculture, plantations, fisheries, trade, and tourism, offering

opportunities for investment. However, previous studies have not produced fully consistent findings. Astuti (2018) and Fadliyanti (2021) examine the relationship between investment and economic growth, while Maulida et al. (2022) report different findings for Aceh Province. These differences reinforce the need to examine the relationship between investment and growth in the eight Barsela regencies/cities.

In addition to fiscal factors and investment, human-resource quality is part of the economic growth process. The Human Development Index (HDI) represents human development achievements across the dimensions of a long and healthy life, knowledge, and a decent standard of living. From a development perspective, improvements in human quality are expected to increase society's productive capacity. However, the statistical relationship between HDI and economic growth is not always consistent because it is influenced by the ability of labor markets and economic structures to absorb human-resource quality. Maulida et al. (2022) found a positive effect of HDI on economic growth in Aceh Province, whereas this study examines the relationship within Barsela, where economic characteristics differ across regions.

Accordingly, this study addresses the research gap by jointly examining the effects of local taxes, regional expenditure, investment, and HDI on economic growth in the eight Barsela regencies/cities during 2011–2025. Panel data allow the study to consider time dimensions and differences among regional units simultaneously (Basuki, 2021). The study aims to determine the partial effects of each variable and the simultaneous effect of all four variables on economic growth in the southwestern region of Aceh Province. The findings are expected to provide more specific empirical evidence on the relationship between fiscal factors, investment, human development, and regional economic growth.

Research objectives

The study aims to: (1) determine the effect of local taxes on economic growth; (2) determine the effect of regional expenditure on economic growth; (3) determine the effect of investment on economic growth; (4) determine the effect of HDI on economic growth; and (5) determine the simultaneous effect of local taxes, regional expenditure, investment, and HDI on economic growth in the southwestern region of Aceh Province.

METHODS

This study uses a quantitative approach with secondary panel data. The research objects are eight regencies/cities in the southwestern region of Aceh Province: Aceh Jaya, Aceh Barat, Nagan Raya, Aceh Barat Daya, Aceh Selatan, Aceh Singkil,

Subulussalam City, and Simeulue. The observation period is 2011–2025. With eight cross-sectional units and fifteen years of observations, the study uses 120 observations. Economic growth and HDI data are sourced from Statistics Indonesia (BPS), while local tax and regional expenditure data are sourced from the Directorate General of Fiscal Balance (DJPK), Ministry of Finance of the Republic of Indonesia; investment data are sourced from BPS.

The dependent variable is economic growth (Y), measured as the percentage growth rate of GRDP at constant prices. The independent variables comprise local taxes (X_1), measured by total realized local tax revenue in billions of rupiah; regional expenditure (X_2), measured by total realized expenditure in billions of rupiah; investment (X_3), measured by total realized investment in millions of rupiah; and HDI (X_4), measured using the Human Development Index. These operational definitions follow the research design in the thesis and are retained in this article.

The analysis uses panel-data regression. Panel data combine time-series and cross-sectional dimensions, allowing variation across regions and over time to be observed. Three estimation approaches are considered: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Model selection is conducted using the Chow test, Hausman test, and Lagrange Multiplier (LM) test, following the panel-regression approaches described by Basuki (2021), Candra (2024), Hutagalung (2022), and Wibowo (2025).

Basic panel-data regression model

$$PE_{it} = \alpha + \beta_1 PD_{it} + \beta_2 BD_{it} + \beta_3 INV_{it} + \beta_4 IPM_{it} + \varepsilon_{it}$$

Note: PE_{it} is the economic growth of regency/city i in year t ; α is the constant; PD is local tax; BD is regional expenditure; INV is investment; HDI is the Human Development Index; β_1 – β_4 are regression coefficients; ε is the error term; i denotes a regency/city in Barsela, and t denotes the years 2011–2025.

Model selection and testing

The Chow test compares CEM and FEM, the Hausman test compares FEM and REM, and the LM test compares CEM and REM. The model-selection hypotheses follow the thesis design. Multicollinearity and heteroskedasticity are then tested. Because the results indicate heteroskedasticity, statistical inference uses White cross-section robust standard errors. Hypothesis testing includes the t-test for partial effects, the F-test for simultaneous effects, and the coefficient of determination to assess the model's ability to explain variation in economic growth.

RESEARCH FRAMEWORK

The research framework positions local taxes, regional expenditure, investment, and HDI as independent variables intended to explain variation in economic growth in Barsela, both partially and simultaneously. This framework is a simplified version of the conceptual framework in the thesis to suit the scope of a journal article.

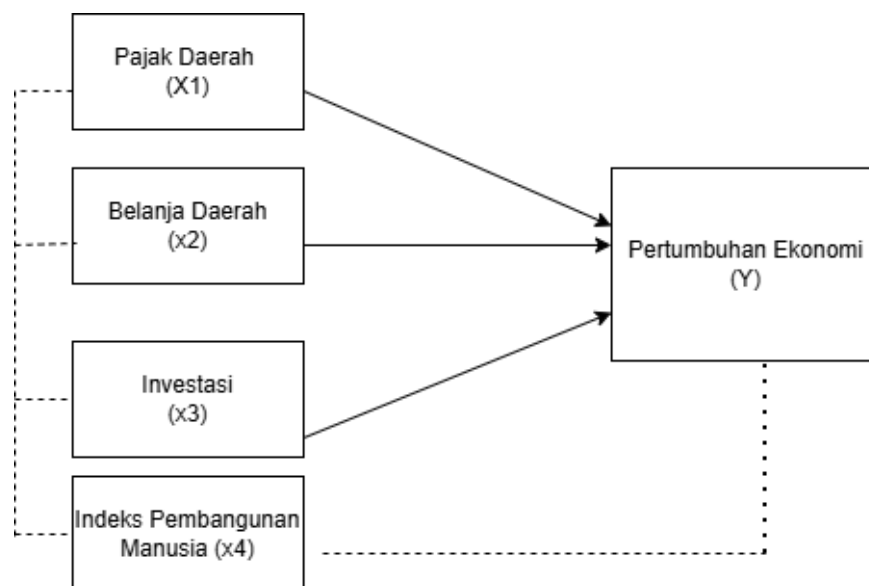


Figure 1. Research framework of local fiscal factors, investment, human development, and economic growth.

Figure 1 shows four main pathways affecting economic growth. Local taxes represent regional revenue capacity, regional expenditure represents government spending, investment represents capital accumulation, and HDI represents human development achievements. The four variables are also tested jointly using the F-test to determine their simultaneous effect.

FINDINGS AND DISCUSSION

Descriptive statistics

Descriptive statistics provide an initial overview of the data distribution across 120 observations. Average economic growth is 4.0355%, with a minimum of -9.00% and a maximum of 7.05%. This variation indicates substantial differences in growth performance across regions and years. Local taxes average IDR 11.00325 billion, while regional expenditure averages IDR 850.1692 billion. Average investment is IDR 1,111.843 million, and average HDI is 67.24892.

Table 1. Descriptive statistics of research variables

Statistic	Growth (Y)	Tax (X ₁)	Expenditure (X ₂)	Investment (X ₃)	HDI (X ₄)
Mean	4.035500	11.00325	850.1692	1111.843	67.24892

Median	4.330000	6.965000	859.3650	712.1400	67.29000
Maximum	7.050000	99.41000	1891.450	4151.280	76.30000
Minimum	-9.000000	1.34000	152.3000	35.45000	59.34000
Std. Dev.	1.835765	12.09951	319.2126	938.4846	3.683627

Source: Data processed from BPS and DJPK, 2026.

Table 1 shows that economic growth has a standard deviation of 1.835765, while investment varies considerably, with a standard deviation of 938.4846. For HDI, the minimum of 59.34 and maximum of 76.30 indicate differences in human development achievements across regions. These descriptive findings support the use of panel data because the economic characteristics of the eight regencies/cities are not entirely homogeneous.

Panel model selection

Table 2. Results of panel model selection tests

Test	Statistic	df	Probability	Model implication
Chow: Cross-section F	0.451292	(7,107)	0.8673	CEM preferred to FEM
Chow: Cross-section χ^2	3.462467	7	0.8392	CEM preferred to FEM
Hausman: Cross-section random	1.15779	4	0.8850	REM preferred to FEM
LM: Breusch-Pagan cross-section	1.558834		0.2118	CEM preferred to REM

Source: Data processed, 2026.

The Chow test yields a probability of 0.8673, greater than 0.05, so CEM is not rejected in favor of FEM. The Hausman test yields a probability of 0.8850, indicating that REM is more appropriate than FEM. However, the final decision between CEM and REM is determined by the LM test. The cross-section probability of 0.2118 is greater than 0.05, so CEM is retained as the final model. Accordingly, the article uses the Common Effect Model.

Common Effect Model and robust inference

The initial CEM estimation produces the equation $PE_{it} = 12.99075 + 0.011112PD_{it} - 0.001518BD_{it} + 0.000438INV_{it} - 0.122851HDI_{it} + e$. Because the study detects heteroskedasticity, inference uses White cross-section robust standard errors. Therefore, the probabilities used to draw conclusions about partial effects are the robust results, not the probabilities obtained from CEM standard errors before correction.

Table 3. Common Effect Model estimation and White cross-section robust results

Variable	Coefficient	Robust Std. Error	Robust t-Statistic	Prob.
C	12.99075	2.502482	5.191147	0.0001
Local tax (X_1)	0.011112	0.019157	0.580031	0.5711
Regional expenditure (X_2)	-0.001518	0.001516	-1.001540	0.3336
Investment (X_3)	0.000438	0.000106	4.113000	0.0011
HDI (X_4)	-0.122851	0.041111	-2.988283	0.0098

Source: Data processed, 2026.

Table 3 presents the main research results. The local tax coefficient of 0.011112 indicates a positive direction, but its probability of 0.5711 exceeds 0.05, meaning the effect is not significant. The regional expenditure coefficient of -0.001518 indicates a negative direction, with a probability of 0.3336, so its effect is also not significant. Investment has a positive coefficient of 0.000438 and a probability of 0.0011, indicating a positive and significant effect. HDI has a coefficient of -0.122851 and a probability of 0.0098, indicating a negative and significant effect at the 5% level.

Table 4. Correlation matrix among independent variables

	X_1	X_2	X_3	X_4
X_1	1.000000	0.590103	0.575906	0.388952
X_2	0.590103	1.000000	0.524062	0.560372
X_3	0.575906	0.524062	1.000000	0.554922
X_4	0.388952	0.560372	0.554922	1.000000

Source: Data processed, 2026.

Correlations among the independent variables are below 0.60. The highest value is the correlation between local taxes and regional expenditure (0.590103), while the lowest is between local taxes and HDI (0.388952). In the thesis, these results are used as a basis

for concluding that there is no indication of high multicollinearity among the independent variables.

Table 5. Simultaneous test and coefficient of determination

Indicator	Value	Interpretation
F-statistic	3.766737	Model jointly significant
Prob(F-statistic)	0.006472	< 0.05
R-squared	0.116737	11.67%
Adjusted R-squared	0.085746	8.57%

Source: Data processed, 2026.

The F-test yields a probability of 0.006472, below 0.05. Thus, local taxes, regional expenditure, investment, and HDI jointly have a significant effect on economic growth. The R-squared value of 0.116737 means that the four variables explain 11.67% of the variation in economic growth before adjustment. After adjusting for the number of variables, the adjusted R-squared of 0.085746 indicates an explanatory capacity of 8.57%, while 91.43% of the variation in economic growth is attributable to factors outside the model.

Local taxes and economic growth

The findings show that local taxes have a positive but insignificant effect on economic growth in Barsela ($p = 0.5711$). The positive coefficient of 0.011112 is conceptually consistent with fiscal decentralization, under which regional revenue can strengthen the government's capacity to finance development. However, the insignificant result indicates that variation in local tax revenue during the observation period is not sufficiently strong to statistically explain changes in regional economic growth.

This finding differs from Pratama (2019), who reported a positive and significant effect. Alpad (2022) also discusses a positive relationship between local taxes and economic growth in Aceh. Differences may be related to regional coverage, observation periods, revenue structures, and local economic characteristics. In Barsela, local tax revenue may be relatively small compared with other revenue sources, so changes in taxes may not be immediately reflected in regional economic growth.

The empirical implication is not that local taxes are unimportant, but that an increase in tax revenue alone has not been shown to sufficiently explain variation in economic growth in this model. This is consistent with the thesis discussion, which emphasizes the need both to optimize revenue and to use it productively. The relationship between taxes and growth should therefore be understood alongside expenditure structure and

regional fiscal capacity.

Regional expenditure and economic growth

Regional expenditure has a coefficient of -0.001518 and a robust probability of 0.3336 , making it statistically insignificant. This differs from the expectation that productive government spending can expand demand and production capacity. The most direct interpretation is that an increase in total regional expenditure has not been shown to be significantly associated with higher economic growth.

The thesis notes that, in the CEM estimation before correction, the probability for regional expenditure was 0.0329 ; after the standard errors were corrected for heteroskedasticity, the probability became 0.3336 . This change is important because it shows that inference should use robust standard errors. Accordingly, the conclusion that regional expenditure is insignificant is based on an estimation that accounts for heteroskedasticity.

This finding differs from Sari (2018), who reported a positive effect in a different research context. Munir and Mahdar (2016) and Juwari et al. (2016) highlight the importance of fiscal structure and expenditure allocation in supporting development. Differences may arise because total expenditure does not distinguish between productive and non-productive spending. Since this study uses total expenditure, expenditure composition is not tested directly. Therefore, the negative result should be interpreted as the direction of the coefficient, not as evidence that every form of government expenditure reduces economic growth.

Investment and economic growth

Investment has a positive and significant effect on economic growth, with a coefficient of 0.000438 and a probability of 0.0011 . This result indicates that increased investment is associated with higher economic growth in Barsela during the study period. The positive direction is consistent with endogenous growth theory, which identifies capital accumulation as a source of growth. Economically, investment can expand production capacity, create employment opportunities, and increase local economic activity.

This result differs from Maulida et al. (2022), who found a negative and insignificant effect of investment across Aceh Province. Astuti (2018) and Fadliyanti (2021) also indicate that the relationship between investment and growth should be considered in light of regional characteristics and investment types. In Barsela, the investment coefficient is relatively small despite being significant. This means that statistical significance is not equivalent to the magnitude of the economic impact represented by

the coefficient. The thesis also notes the possibility of investment being concentrated in particular sectors, unevenly distributed across regions, or separated from its impact on output by a time lag; however, these factors are not directly tested in the model.

The investment finding shows that the capital variable has a stronger empirical relationship with growth than the other three variables in the model. Nevertheless, this article retains an interpretation consistent with the estimation results and does not conclude that investment is the sole determinant of growth. The low adjusted R-squared indicates that many factors beyond investment and the variables in the model also contribute to variation in economic growth.

Human Development Index and economic growth

HDI has a negative and significant effect on economic growth, with a coefficient of -0.122851 and a probability of 0.0098 . This indicates a statistically negative relationship in the Barsela sample over 2011–2025. The finding runs counter to expectations in human development theory, which links improvements in education, health, and living standards to productivity. Therefore, the negative result does not automatically mean that human development hinders growth; rather, it indicates that, in this dataset and model specification, an increase in HDI is associated with a negative growth coefficient after other variables are taken into account.

The thesis suggests that human-resource quality may not yet be optimally absorbed by employment and productive economic activities. This explanation should be treated as a possibility because the research model does not directly test labor absorption, skills mismatch, or labor-market structure. Maulida et al. (2022) found a positive and significant effect of HDI on economic growth in Aceh Province. The difference in direction between that study and the Barsela findings highlights the importance of considering regional coverage, period, and local economic characteristics.

In Barsela, variation in HDI across regions is evident from the descriptive statistics, with a minimum of 59.34 and a maximum of 76.30 . This difference indicates that human development achievements are not uniform. The negative relationship should be followed up by research incorporating workforce quality, unemployment, economic-sector structure, productivity, and the alignment of education with labor-market needs. Thus, this empirical finding provides a basis for further testing rather than a conclusion that higher HDI generally causes lower growth.

Joint effect of local taxes, expenditure, investment, and HDI

The simultaneous test yields an F probability of 0.006472, indicating that the four variables jointly have a significant effect on economic growth. This finding suggests that economic growth dynamics in Barsela are not associated with just one policy source or development factor. Local taxes and regional expenditure represent the fiscal dimension, investment represents capital accumulation, and HDI represents the human development dimension. This combination is consistent with endogenous growth theory, which positions government policy, capital, and human quality as internal elements that may be associated with growth.

Although the simultaneous test is significant, the adjusted R-squared is only 0.085746. This means that the four variables have limited ability to explain variation in economic growth, and 91.43% of the variation remains unexplained by the model. The thesis identifies several potentially relevant factors, including central government transfers, prices of leading commodities, and the sectoral characteristics of each regency/city. Therefore, the simultaneous result should be interpreted alongside the model's limited explanatory power.

CONCLUSION

This study analyzes the effects of local taxes, regional expenditure, investment, and HDI on economic growth in eight regencies/cities in the southwestern region of Aceh Province during 2011–2025, using 120 panel-data observations. Model selection indicates that the Common Effect Model is the final model after considering the Chow, Hausman, and LM tests. Because heteroskedasticity was detected, inference uses White cross-section robust standard errors.

Partially, local taxes have a positive but insignificant relationship with economic growth. Regional expenditure has a negative but insignificant relationship. Investment has a positive and significant relationship, whereas HDI has a negative and significant relationship at the 5% level. Simultaneously, local taxes, regional expenditure, investment, and HDI significantly affect economic growth. The adjusted R-squared of 8.57% indicates that most variation in economic growth is still explained by factors outside the model.

Based on these findings, future research could expand the model by including fiscal transfers, prices of leading commodities, sectoral structure, employment, and productivity variables. Longer datasets or approaches that account for dynamic effects could also be used to examine possible lags between policy, investment, human development, and economic growth. For regional policymaking, the findings highlight the importance of viewing revenue, expenditure, investment, and human

development as interconnected components rather than isolated indicators.

REFERENCES

- Alpad, A. (2022). Analisis pengaruh pajak daerah terhadap pertumbuhan ekonomi Provinsi Aceh. 2(2), 651–655.
- Astuti, P. W. (2018). Analisis pengaruh investasi terhadap pertumbuhan ekonomi (studi pada 33 provinsi di Indonesia). Jurnal Ilmiah Mahasiswa FEB, 6(2).
- Basuki. (2021). Analisis data panel dalam penelitian ekonomi dan bisnis. PT Rajagrafindo Persada.
- Candra. (2024). Model regresi data panel pada pengaruh faktor curah hujan terhadap produksi kopi di Provinsi Sumatera Selatan tahun 2014–2021. Jurnal Penelitian Sains, 26(1), 30–39.
- Fadliyanti. (2021). Pengaruh belanja modal, investasi PMDN dan investasi PMA terhadap pertumbuhan ekonomi kabupaten/kota di Provinsi NTB. Journal of Economics and Business, 7(1), 18–39.
- Hutagalung, I. P. (2022). Analisis regresi data panel dengan pendekatan Common Effect Model (CEM), Fixed Effect Model (FEM) dan Random Effect Model (REM): Studi kasus IPM Sumatera Utara periode 2014–2020. FARABI: Jurnal Matematika dan Pendidikan Matematika, 5(2), 217–226.
- Juwari, S. D., & Ulfah, Y. (2016). Pengaruh pajak dan retribusi serta DAU dan DAK terhadap belanja daerah dan pertumbuhan ekonomi pada kabupaten/kota di wilayah Kalimantan. Jurnal GeoEkonomi.
- Maulida, et al. (2022). Pengaruh investasi, inflasi dan Indeks Pembangunan Manusia terhadap pertumbuhan ekonomi di Provinsi Aceh. JIM: Jurnal Ilmiah Mahasiswa, 21–38.
- Mina, et al. (2020). Pengaruh pajak daerah, retribusi daerah dan laba Badan Usaha Milik Daerah (BUMD) terhadap pertumbuhan ekonomi Kabupaten Aceh Utara. Jurnal Ekonomi Regional Unimal, 3(1), 39–51.
- Munir, M., & Mahdar, N. M. (2016). Pengaruh pertumbuhan ekonomi, Pendapatan Asli Daerah dan Dana Alokasi Umum terhadap pengalokasian anggaran belanja modal dalam mendukung pelaksanaan otonomi daerah, 3(2), 30–37.
- Pratama, M. I. (2019). Pengaruh pajak daerah, retribusi daerah dan belanja langsung terhadap pertumbuhan ekonomi kabupaten/kota di Provinsi Aceh.
- Riandhani, L., Andiny, P., Rizal, Y., & Safuridar. (2024). Pengaruh pajak daerah dan retribusi daerah terhadap pertumbuhan ekonomi Provinsi Aceh. Jurnal Bisnis, Ekonomi Syariah, dan Pajak, 1(4), 62–72. <https://doi.org/10.61132/jbep.v1i4.648>
- Sari, I. N. (2018). Pengaruh pertumbuhan ekonomi, PAD dan Dana Alokasi Umum. Jurnal Ilmu dan Riset Akuntansi, 7(12), 1–19.

- Utami, P., & Masyitah, E. (2023). Pengaruh pajak daerah, retribusi daerah, laba BUMD, dan belanja modal terhadap pertumbuhan ekonomi di Aceh. *Management, Accounting, Islamic Banking and Islamic Economic Journal*, 1(1), 82–94.
- Vellia, F., & Mildawati, T. (2021). Pengaruh pajak daerah dan retribusi daerah terhadap belanja daerah Kota Surabaya. *Jurnal Ilmu dan Riset Akuntansi*, 10(1), 1–18.
- Wibowo, S. A. (2025). Penggunaan EViews dalam pengujian data panel untuk penelitian akuntansi: Pendekatan konseptual dan aplikatif. *Reviu Akuntansi dan Bisnis Indonesia*, 9(1), 174–186.