An Analysis of the Impact of Regional Taxes, Social Assistance Expenditures, and Income Inequality on Economic Growth in Regencies/Cities in Aceh Province

Original Article

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Abstract

This study aims to analyze the impact of regional taxes, social assistance expenditures, and income inequality on the economic growth of regencies/cities in Aceh Province for the 2020-2023 period using a panel regression model. The analysis results indicate that regional taxes have a positive and significant impact on economic growth, where increased regional taxes contribute to the development of critical infrastructure and public services. Furthermore, social assistance expenditures also enhance household purchasing power, which directly boosts local economic growth. However, income inequality has a negative and significant impact on growth, as rising inequality hinders public access to education and healthcare and creates social instability. These findings underscore the importance of effective management of regional taxes and social assistance programs, as well as the need for policies to reduce income inequality as a strategy to promote inclusive and sustainable economic growth in Aceh. This study provides recommendations for local governments to formulate more progressive policies in managing economic resources for the welfare of society.

Keywords: Economic Growth, Income Inequality, Regional Taxes, Social Assistance Expenditures.

1. Introduction

Economic growth is one of the primary indicators reflecting the success of regional development. In Aceh Province, economic growth continues to face significant challenges despite its special autonomy status and abundant natural resource potential. Figure 1, illustrating economic growth trends in Aceh Province and Indonesia from 2017 to 2023, reveals several important patterns. From 2017 to 2019, Aceh exhibited relatively stable growth rates, hovering around 4% (4.18% in 2017, 4.61% in 2018, and 4.14% in 2019). However, in 2020, Aceh's economic growth sharply declined to -0.37%, following the significant impact of the global COVID-19 pandemic, which triggered economic contractions worldwide, including in Indonesia and Aceh Province.

In 2021, Aceh Province's economy began to recover with a growth rate of 2.81%, although it remained well below pre-pandemic levels. Similarly, Indonesia showed a recovery trend, with the national economic growth recorded at 3.07% in 2021, albeit lower than in previous years. In 2022 and 2023, Aceh again posted positive growth rates of 4.21% and 4.23%, respectively, although still slightly lower than Indonesia's higher growth rates of 5.31% in 2022 and 5.05% in 2023.
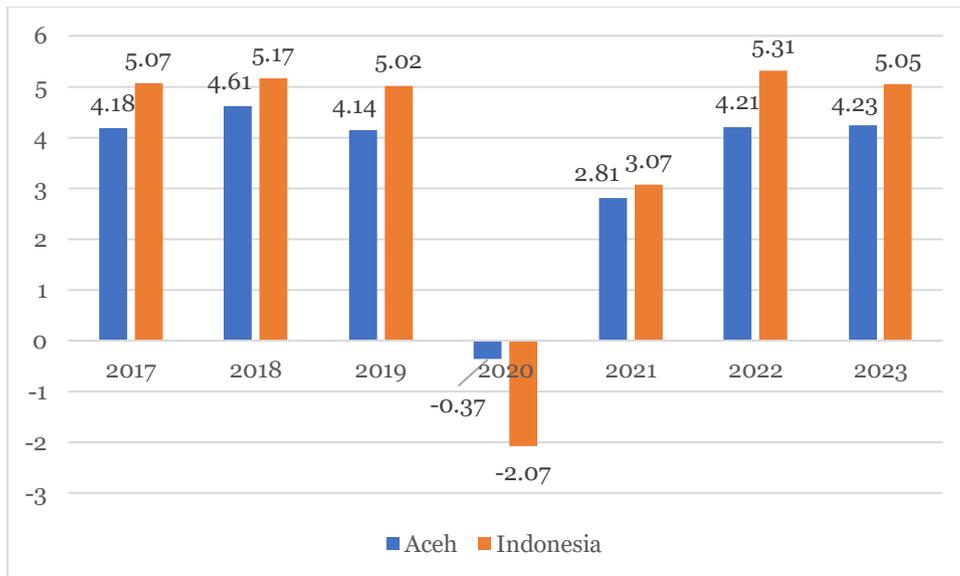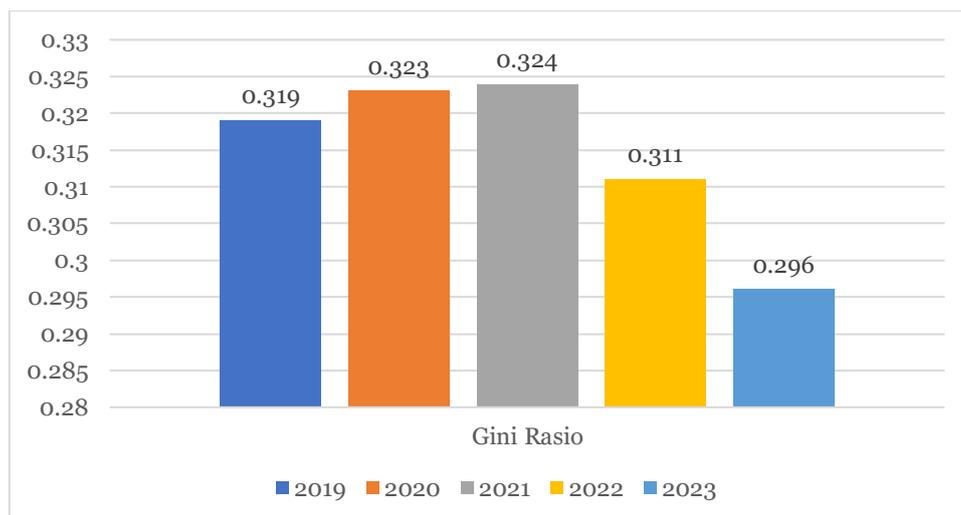
**Figure 1. Trends in Economic Growth
in Aceh Province and Indonesia, 2017-2023**
Source: Badan Pusat Statistik (2024)

The main issue highlighted in Figure 1 is that, although Aceh Province exhibits positive growth rates, these figures remain relatively lower than Indonesia's overall growth, particularly in the post-pandemic period. This indicates that Aceh faces structural challenges in accelerating its growth rate. Despite economic recovery, the growth disparity between Aceh and Indonesia deserves attention to foster more effective and sustainable development policies in the province.

One of the key instruments in regional economies is regional taxes, which serve as the primary source of local revenue (PAD). Regional taxes play a vital role in funding various development programs, including infrastructure, education, and healthcare. However, according to data from the Ministry of Finance, the contribution of regional taxes to Aceh Province's GRDP in 2022 was only 1.5%, significantly lower than the national average of 2.5%. This indicates untapped potential in the collection and management of regional taxes in Aceh Province, which could hinder government efforts to boost economic growth.

In addition to regional taxes, social assistance expenditures are a fiscal instrument used by local governments to support poor and vulnerable populations. According to Statistics Indonesia (BPS), Aceh Province had the highest poverty rate in Sumatra at 14.75% in 2023. The province allocates a significant budget for social assistance programs, which are expected to enhance household purchasing power, boost consumption, and ultimately accelerate economic growth. However, the effectiveness of social assistance spending is often influenced by the program's design, the accuracy of targeting beneficiaries, and its potential long-term impact on human development.

On the other hand, income inequality poses a significant challenge to achieving inclusive economic growth. Aceh Province's Gini Ratio in 2023 was recorded at 0.296, indicating a moderate level of income inequality. However, this disparity can still hinder economic growth, as low-income groups often face limited access to education, healthcare, and productive employment opportunities. Moreover, inequality has the potential to create social instability, which can disrupt the economic development process.

Figure 2. Trends in the Gini Ratio of Aceh Province, 2019-2023
Source: Badan Pusat Statistik (2024)

The relationship between regional taxes, social assistance expenditures, and income inequality on economic growth is a highly relevant issue in the context of development in Aceh Province. Well-managed regional taxes can increase local revenues, which can, in turn, be used to finance development programs, including social assistance. Effective social assistance is expected to reduce income inequality and enhance the participation of low-income groups in economic activities. However, if these three elements are not managed effectively, they could become barriers to economic growth.

Empirical studies on the impact of these three variables on economic growth are still limited, particularly in the context of Aceh Province. Most previous research tends to separate the analysis of the effects of regional taxes, social assistance expenditures, and income inequality on economic growth. By understanding how regional taxes, social assistance, and income inequality affect economic growth, this study is expected to support the local government's efforts in Aceh to achieve sustainable development goals. One of the key targets in the Sustainable Development Goals (SDGs) is to reduce income inequality (Goal 10) and ensure inclusive and sustainable economic growth (Goal 8). Therefore, this study is expected to provide direct benefits to the people of Aceh through more inclusive economic policies.

2. Literature Review

2.1. Income Inequality and Economic Growth

Various studies have examined the relationship between income inequality and economic growth, with diverse and often conflicting results. Alesina and Rodrik (1994), Persson & Tabellini (1991), and Perotti (1996) were among the early studies that found that inequality has a negative impact on economic growth. This finding was further developed in subsequent research, such as the works of Panizza (2002), Wan et al. (2006), Cingano (2014), Wahiba & El Weriemmi (2014), Yang & Greaney (2017), Braun et al. (2019), Royuela et al. (2019), and Rahmadi & Parmadi (2019). These studies suggest that inequality can slow growth through mechanisms such as social instability, low investment in human capital, and reduced economic efficiency.

However, this result contrasts with other studies that find a positive impact of inequality on growth. Research such as Forbes (2000) and Panzera & Postiglione (2021) suggests that, in certain contexts, an increase in income inequality can drive economic growth. This can

occur when inequality creates incentives for individuals to work harder, innovate, or take greater economic risks.

However, some studies explain that the impact of income inequality on growth is negative in the early stages of development but becomes positive in more mature stages of development (Shin, 2012). This is supported by Ogus Binatli (2012), who shows that during the period 1970–1985, the impact of inequality on growth was negative, whereas during the period 1985–2012, the impact became positive. A more segmented approach is also demonstrated by Fawaz et al. (2014), who found that the impact of income inequality on growth was positive in high-income developing countries but negative in low-income developing countries. This research indicates that the effect of income inequality on economic growth is not universal, but is influenced by the characteristics and economic conditions of each country.

2.2. Regional Taxes and Economic Growth

Rizal et al. (2022) explain that tax revenue has a positive and significant impact on economic growth, especially when used productively. This finding is supported by previous studies, such as Mutiara (2015), Saragih (2018), Vatavu et al. (2019), Ramadhan et al. (2021), which state that tax revenue is one of the main sources of funding to drive economic growth. In this context, tax revenue contributes through sustainable funding for local expenditures, particularly those of a productive nature, such as infrastructure, education, and public services. Saragih (2018) emphasizes that for taxes to have an optimal effect, their use must be directed towards supporting strategic sectors that can stimulate economic activity, thereby creating a multiplier effect.

However, there are conflicting views regarding the impact of taxes on economic growth. For example, Angelopoulos et al. (2007) found that lower taxes can stimulate economic growth, arguing that a lighter tax burden encourages investment and consumption, thus accelerating economic activity. Conversely, higher taxes can have the opposite effect, potentially hindering economic growth by reducing disposable income and investment incentives.

In the regional context, Saragih (2018) emphasizes that the positive impact of taxes on economic growth largely depends on the management and allocation of these revenues. Regional tax revenues directed towards financing productive projects have significant potential to accelerate economic growth. Therefore, although there are differing views, most studies agree that effective management of tax revenues, particularly by prioritizing productive spending, is a key factor in driving sustainable economic growth.

2.3. Social Spending and Economic Growth

The impact of social spending on economic growth is a complex topic that often yields diverse findings. Research by Bação et al. (2024) suggests that social spending can have a negative effect on economic growth, especially if such expenditures create economic incentive distortions. For example, high unemployment benefits tend to reduce the labor supply by weakening the incentives to work. On the other hand, Estevez-Abe et al. (2003) explain that social spending on education and healthcare can provide long-term benefits by promoting greater human capital accumulation. Moreover, policies that support a balance between work and family, along with active labor market policies, can have a positive impact on growth by enhancing workforce quality (Cahya & Maula, 2021). However, there are other challenges related to social spending, such as population aging, which leads to increased pension burdens in many developed countries. This may force governments to raise taxes, which could potentially slow down economic growth. Nevertheless, if pension benefits are linked to wages,

such policies can provide job security for skilled workers, encouraging them to invest in long-term skill development, thereby indirectly supporting economic growth.

3. Methods

The data collection in this study uses secondary data, with economic growth as the dependent variable, and regional taxes, social assistance expenditure, and income inequality as the independent variables. The data is sourced from the Ministry of Finance of the Republic of Indonesia and the Central Statistics Agency (BPS) for the districts/cities in Aceh Province from 2020 to 2023. The method used is panel regression analysis with the following equation:

$$PDRBit = a + \beta_1 PDit + \beta_2 BBSit + \beta_3 GRit + e$$

Explanation:

PDRB = Gross Domestic Product (GDP) per District/City in Aceh Province
PD = Regional Tax per District/City in Aceh Province
BBS = Social Assistance Expenditure per District/City in Aceh Province
GR = Income Inequality
a = Constant
$\beta_{1,2,3}$ = Regression Coefficients
i = Year
t = District/City

There are three models that can be used for panel data regression: Pooled OLS/Common Effect, Fixed Effect, and Random Effect. The tests that need to be conducted to determine the best model among these three are the Chow test, Hausman test, and Lagrange Multiplier test (Widarjono, 2018).

Next, classical assumption tests are conducted, which include tests for normality, autocorrelation, multicollinearity, and heteroscedasticity. However, one of the advantages of panel data is that normality and autocorrelation tests are not necessarily due to the nature of panel data, which combines both cross-sectional and time-series data, each with distinct characteristics from the respective methods (Basuki & Yuliadi, 2014; Napitupulu et al., 2021). Therefore, in this study, normality and autocorrelation tests will not be conducted, but classical assumption tests will include multicollinearity and heteroscedasticity tests.

Statistical testing will be performed using the t-test and F-test, as well as calculating the R^2 coefficient of determination. The t-test aims to identify the statistical significance of each regression coefficient individually, while the F-test is used to assess the joint statistical significance of the regression coefficients. The R^2 coefficient of determination is used to evaluate how well the independent variables explain the dependent variable.

4. Results and Discussion

4.1. Research Result

4.1.1. Model Selection Test

The initial step in analyzing panel data in a research study is selecting one of the several panel data regression models. The model selection is done through the Chow test, Hausman test, and Lagrange Multiplier test. If one model is chosen twice out of these three model

selection tests, then that model will be used for the analysis, as done in Syarifudin). Below are the results of the model selection tests for panel data analysis:

A. Chow Test Results

The Chow test is conducted to select the best model between the Fixed Effect Model (FEM) and the Common Effect Model (CEM). In Table 1, the p-value is 0.0000 < 0.05. According to the Chow test, the best analytical model is the Fixed Effect Model (FEM).

Table 1. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	454.124947	(22,66)	0.0000
Cross-section Chi-square	462.423691	22	0.0000

Source: Data Processed, 2024

B. Hausman Test Results

The Hausman test is used to select the best model between the Fixed Effect Model (FEM) and the Random Effect Model (REM). In Table 2, the Prob. value is 0.0002, which is less than 0.05. Based on the results of the Hausman test, the best analysis model is the FEM (Fixed Effect Model).

Since the FEM model was selected twice in both the Chow test and the Hausman test, the Lagrange Multiplier (LM) test is no longer necessary. According to Syarifudin (2020), the best model used to interpret panel data regression is the one that is selected twice after testing. Therefore, the best analysis model used in this study is the FEM (Fixed Effect Model).

Table 2. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	20.229079	3	0.0002

Source: Data Processed, 2024

4.1.2. Classical Assumption Test

A. Multicollinearity Test

The multicollinearity test aims to examine whether there is correlation or a relationship between the independent variables in the regression model. A good regression model should not have any relationships between the independent variables. The multicollinearity test can be observed from the correlation coefficients between the research variables, with the following guidelines:

a. If the correlation value > 0.8, it can be concluded that multicollinearity is present.
b. If the correlation value < 0.8, it can be concluded that multicollinearity is not present.

Table 3. Results of Multicollinearity Test

	PD	BBS	GR
PD	1.000000	0.004732	0.306866
BBS	0.004732	1.000000	0.103879
GR	0.306866	0.103879	1.000000

Source: Data Processed, 2024

Based on Table 3, it can be proven that the correlation coefficient values between the variables in this study are below 0.8. This indicates that there is no multicollinearity among the research variables.

B. Heteroscedasticity Test

The heteroscedasticity test can be performed using the Glejser test. If the probability value is greater than 0.05, it indicates that there is no heteroscedasticity. If the probability value is less than 0.05, it indicates the presence of heteroscedasticity. The results of the heteroscedasticity test are presented in Table 4, showing that the probability values for the variables PD, BBS, and GR are greater than 0.05. Therefore, it can be concluded that the probability values of the independent variables are above the 5% significance level, meaning the variables in this study are free from heteroscedasticity.

Table 4. Results of the Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	409.4439	217.6596	1.881120	0.0644
PD	0.175426	1.757541	0.099813	0.9208
BBS	0.794969	1.974461	0.402626	0.6885
GR	-864.0264	738.0757	-1.170647	0.2460

Source: Data Processed, 2024

4.1.3. FEM Model Estimation Test Results

The results of the panel data estimation regarding the impact of regional taxes, social assistance spending, and income inequality on economic growth in Aceh Province can be seen in Table 5 below:

Table 5. Results of FEM Model Estimation Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6945.591	473.8383	14.65815	0.0000
PD	12.02632	3.826114	3.143220	0.0025
BBS	12.03245	4.298342	2.799323	0.0067
GR	-4941.359	1606.769	-3.075339	0.0031
	Effects Specification			
Cross-section fixed (dummy variables)				

R-squared	0.996510	Mean dependent var	5984.312	
Adjusted R-squared	0.995188	S.D. dependent var	4371.710	
S.E. of regression	303.2685	Akaike info criterion	14.50020	
Sum squared resid	6070137.	Schwarz criterion	15.21288	
Log likelihood	-641.0091	Hannan-Quinn criter.	14.78784	
F-statistic	753.7564	Durbin-Watson stat	1.853257	
Prob(F-statistic)	0.000000			

Source: Data Processed, 2024

The data processing results in Table 5 for the F test show a statistical F probability value of 0.000000, which is smaller than 5%, indicating that the independent variables PD, BBS,

and GR have a significant joint effect on economic growth in Aceh Province. The R-squared value from the data processing results is 0.996510, meaning that 99.65% of the growth in Aceh Province is explained by PD, BBS, and GR in this study's model. The remaining 0.35% is explained by other variables not included in the study. The interpretation of these results can be explained as follows:

4.2. Discussion

4.2.1. The Effect of Local Tax on Economic Growth in Aceh Province

Table 5 shows a coefficient of 12.03245 with a significance level of 0.0025, indicating that local taxes have a positive and significant impact on economic growth. When local taxes increase, economic growth also rises, and vice versa. This finding is consistent with studies by Mutiara (2015), Saragih (2018), Vatavu et al. (2019), Ramadhan et al. (2021), and Rizal et al (2022).This finding can be explained through several key factors.

a) Local taxes in Aceh are often allocated to fund infrastructure projects, such as the construction of roads, bridges, and other public facilities. Investment in infrastructure is crucial as it improves accessibility and connectivity between regions. With better infrastructure, transportation costs are reduced, and travel times become more efficient, thus facilitating trade and business activities. In the context of Aceh, which faces geographical and historical challenges, strengthening infrastructure through local taxes can serve as a key driver for economic growth.

b) In addition, local taxes also contribute to financing public services, such as education and healthcare, which are essential for the people of Aceh. Improvements in the quality of education in the region can produce a more skilled and productive workforce, while good healthcare services will maintain public health. When the people of Aceh have better access to education and healthcare, they will be more capable of actively contributing to the economy. Therefore, effective management of local taxes not only enhances infrastructure but also supports the development of high-quality human resources (HR).

c) Proper management of local taxes can create economic stability in Aceh. Consistent revenue from taxes allows local governments to plan and implement development programs sustainably, including social assistance programs. This stability will attract the interest of investors, who are more likely to invest in regions with clear and well-planned fiscal policies. As investment increases, new jobs will be created, ultimately boosting household income and overall economic growth. Therefore, local taxes serve as a crucial tool in attracting investment and creating economic stability in Aceh Province.

With all the points mentioned above, it is evident that local taxes play a significant role in driving economic growth in Aceh Province. The use of taxes for infrastructure development, improvement of public services, creation of economic stability, and enhancement of regional independence all contribute to creating a conducive environment for business development and improving the quality of life for the community.

4.2.2. Social Assistance Spending and Economic Growth in Aceh Province

Table 5 shows a coefficient of 12.02632 with a significance level of 0.0067, meaning that social assistance spending has a positive and significant effect on economic growth. When social assistance spending increases, economic growth also increases, and vice versa. This finding aligns with the research by Estevez-Abe et al. (2003) and Furceri & Zdzienicka (2012). When the government increases social assistance spending, the funds are directly channeled

to those in need, particularly vulnerable groups such as poor families, the elderly, and people with disabilities. By distributing this aid, the purchasing power of the community increases, which in turn stimulates the consumption of goods and services. In the context of Aceh, where many people still rely on assistance to meet basic needs, an increase in social assistance spending can be a significant driving force for the local economy.

An increase in social assistance spending also contributes to social stability. With the assistance, the community feels more protected and has better access to basic needs such as food, education, and healthcare. This social stability is particularly important in regions that have experienced conflict, such as Aceh, where uncertainty can hinder economic growth. When the community feels safe and secure, they are more likely to invest in education and healthcare, which, in the long run, will improve human resource quality and productivity in the region.

Furthermore, social assistance spending can stimulate the growth of micro and small enterprises (Sugianti & Anwar, 2021). When the community receives assistance, they have more money to spend, including on local products. This can increase the demand for products produced by micro and small businesses in Aceh. As demand rises, these small enterprises will experience growth, create new jobs, and increase community income. Thus, social assistance not only provides direct benefits to recipients but also creates a positive domino effect for the local economy.

Social assistance spending also plays a role in reducing economic inequality. In Aceh, where there is still a significant disparity between urban and rural areas, social assistance can help equalize income and opportunities. By directing assistance funds to disadvantaged communities, the government can reduce the gap between different economic groups. This reduction in inequality is important not only for social justice but also for creating a more stable and sustainable economic environment.

4.2.3. Income Inequality and Economic Growth in Aceh Province

Table 5 shows a coefficient of -4941.359 with a significance level of 0.0031, indicating that income inequality has a negative and significant effect on economic growth. As income inequality increases, economic growth tends to decline, and vice versa. This finding is supported by research from Panizza (2002), Wan et al. (2006), Cingano (2014), Wahiba & El Weriemmi (2014), Yang & Greaney (2017), Braun et al. (2019), Royuela et al. (2019), and Rahmadi & Parmadi (2019).

When income inequality increases, most of the wealth tends to accumulate in the hands of a few individuals, while the majority of the population, particularly those at the lower levels, continues to live in difficult economic conditions. This leads to a decrease in purchasing power, which directly impacts the demand for goods and services. As demand decreases, it can hinder the growth of the local economic sector, thereby putting downward pressure on overall economic growth.

Furthermore, high income inequality can reduce investment in education and healthcare. People in the lower income brackets often lack sufficient access to quality education and adequate healthcare services. Without proper education, opportunities to improve skills and productivity become severely limited. This creates a cycle of poverty that is difficult to break, where the next generation is also trapped in economic limitations. In the context of Aceh, where improving human capital is crucial for long-term development, high income inequality becomes a significant barrier to progress.

Income inequality can also lead to social instability. When the majority of wealth is concentrated in the hands of a few, dissatisfaction among the less fortunate can increase. This

dissatisfaction may lead to protests, riots, or even social conflicts, which will directly disrupt economic activities and investment in the region. In Aceh, which has experienced prolonged conflict, it is crucial to maintain social stability as a prerequisite for sustainable economic growth. Instability caused by income inequality can hinder efforts to attract new investment and create jobs.

The negative impact of income inequality can also be seen in government expenditures. When income is distributed unevenly, the government may focus more on policies that benefit the wealthy, while the needs of the poor are neglected. This can result in a lack of investment in essential infrastructure and public services, such as education and healthcare. The insufficiency of these services will exacerbate inequality and hinder economic growth, creating a negative cycle that is difficult to break.

5. Conclusion

The results of the study show that local taxes have a positive and significant impact on economic growth in Aceh Province. With an increase in local taxes, the government can allocate funds for essential infrastructure projects and public services, facilitating the growth of the economic sector and improving the quality of life for the people. This indicates that local taxes are not only a source of revenue but also a strategic tool in driving sustainable economic growth.

On the other hand, social assistance spending also has a significant positive impact on economic growth. An increase in social assistance spending boosts the purchasing power of the population, which in turn increases consumption and drives growth in the micro and small business sectors. By supporting vulnerable groups, social spending not only reduces poverty but also contributes to social and economic stability in Aceh, which is crucial for creating a conducive environment for growth.

However, income inequality has a negative impact on economic growth. High inequality hinders access to education and healthcare, creating a poverty cycle that is difficult to break. Social dissatisfaction resulting from inequality can also lead to instability, disrupting investment and growth. Therefore, addressing income inequality is crucial as a key step in fostering inclusive and sustainable economic growth in Aceh Province.

To maximize the positive impact of local taxes on economic growth, the Aceh regional government is advised to formulate more progressive and transparent tax policies. This includes improving the efficiency of tax collection and ensuring that the funds generated are optimally allocated to infrastructure projects that support economic growth. Additionally, community involvement in the planning and budgeting processes is crucial to ensure that local needs and priorities are adequately addressed.

Regarding social assistance spending, the government needs to strengthen existing programs and ensure that the assistance is directed to those in need. The development of an effective monitoring and evaluation system can help assess the impact of social assistance programs, enabling necessary adjustments to maximize benefits for the community. Additionally, training and mentoring for recipients can improve their ability to manage assistance effectively, fostering economic independence.

Finally, to reduce income inequality, the government must implement policies that target the reduction of economic disparities. This can be achieved by improving access to education and healthcare for disadvantaged communities, as well as supporting micro and small enterprises. Programs that enhance workforce skills and create new job opportunities

are also crucial. With the right policies in place, it is hoped that economic growth in Aceh can proceed inclusively, benefiting all segments of society and fostering more equitable prosperity.

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