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The Influence of Tourism Indicators on Economic Growth in North Sumatra Province During the 2015–2024 Period

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A B S T R A C T
This study aims to analyze the influence of tourism indicators on economic growth in North Sumatra Province during 2015–2024. The independent variables used in this study were international tourist arrivals, hotel occupancy rates, and average length of stay, while economic growth was used as a dependent variable. This study applies a quantitative approach using secondary time series data obtained from the Central Statistics Agency (BPS). The analysis method used is multiple linear regression analysis. The results showed that hotel occupancy rates had a significant influence on economic growth, while international tourist arrivals and average length of stay did not have a significant effect on partial economic growth. At the same time, tourism indicators significantly affect economic growth in North Sumatra Province.

INTRODUCTION

Tourism has become one of the important sectors that contributes to regional economic growth in Indonesia. The tourism sector is able to generate jobs, increase regional income, and encourage the development of supporting industries such as transportation, accommodation, and trade. In recent years, tourism development has been increasingly prioritized by the Indonesian government as part of the regional economic development strategy.

North Sumatra Province has considerable tourism potential due to its natural attractions, cultural diversity, and strategic tourist destinations, especially Lake Toba as one of Indonesia's super priority tourist destinations. The development of tourism activities in North Sumatra is expected to contribute positively to regional economic growth through increasing tourist spending and business activities in the tourism sector.

Several tourism indicators are commonly used to measure tourism development, including international tourist arrivals, hotel occupancy rates, and average length of stay. International tourist arrivals reflect the number of foreign visitors entering an area, while hotel occupancy rates reflect the utilization rate of tourism accommodation facilities. In addition, the average length of stay describes the consumption activity of tourists during their visit. These indicators are closely related to the economic activities generated by the tourism sector.

The relationship between tourism and economic growth is explained through the Tourism-Led Growth Hypothesis (TLGH), which states that tourism development can stimulate economic growth through foreign exchange income, investment, and employment opportunities (Brida et al., 2016). In addition, the multiplier effect theory explains that tourism spending can create a broader economic impact in various sectors of the regional economy.

Previous studies on tourism and economic growth have yielded mixed findings. Some studies have found that tourism indicators have a positive impact on economic growth, while others show an insignificant relationship depending on regional conditions and tourism management. Therefore, further empirical analysis is still needed, especially in North Sumatra Province, where tourism development continues to grow.

This study aims to analyze the influence of international tourist arrivals, hotel occupancy rates, and average length of stay on economic growth in North Sumatra Province during 2015–2024. This research is expected to provide empirical evidence regarding the contribution of tourism indicators to regional economic growth and become a reference for tourism development policies in North Sumatra Province.

THEORETICAL OVERVIEW

Tourism-Led Growth Hypothesis (TLGH)

The Tourism-Led Growth Hypothesis (TLGH) suggests that tourism development plays an important role in stimulating economic growth. This theory explains that tourism activities are not only limited to recreational destinations but also serve as one of the sectors that are able to generate income, create jobs, attract investment, and encourage the expansion of supporting industries. Tourism is increasingly becoming a strategic sector for many countries and regions as its

contribution goes beyond direct tourism revenues and influences broader economic activities.

Tourism development contributes to economic growth through several channels. Increased tourism activities generally drive demand for accommodation, transportation, food and beverage services, entertainment, and other supporting facilities. As demand increases, business activities in tourism-related sectors become more intensive, creating additional income and employment opportunities. As a result, tourism is often considered an effective instrument for promoting regional development and improving economic performance.

The relationship between tourism and economic growth has received considerable attention from researchers. According to Brida et al. (2016), tourism can stimulate economic growth through increasing foreign exchange earnings, investment expansion, infrastructure development, and job creation. Areas with abundant tourism resources and well-developed supporting facilities tend to experience stronger economic performance as tourism activities encourage revenue circulation throughout the economy. Therefore, tourism is often considered one of the important sectors that is able to support sustainable economic development.

North Sumatra Province has considerable tourism potential supported by various natural and cultural tourism. The designation of Lake Toba as one of Indonesia's super priority tourism destinations reflects the government's commitment to accelerate the development of tourism in the region. In addition, the increasing availability of transportation facilities and tourism infrastructure is expected to strengthen the contribution of the tourism sector to regional economic growth. Therefore, tourism indicators are an important variable in explaining the economic performance of North Sumatra Province.

International tourist arrivals represent the number of foreign tourists visiting a particular destination in a given time period. The increase in foreign tourist arrivals is expected to encourage tourism spending and encourage economic activities in the tourism supporting sector. Higher tourist arrivals can increase demand for accommodation services, transportation, culinary businesses, and other tourism facilities. This activity creates additional income and can contribute positively to regional economic growth.

Several previous studies have reported that the arrival of international tourists has a positive impact on economic growth because tourism activities are able to increase regional income and create jobs. However, some empirical studies have also found different results, showing that the contribution of tourist arrivals to economic growth depends on various factors such as the quality of infrastructure, tourism management, and tourist spending patterns. In some cases, increased tourist arrivals do not necessarily lead to higher economic growth because economic leakage and uneven distribution of tourism activities can reduce the benefits generated by the tourism sector.

Based on the Tourism-Led Growth Hypothesis and supported by previous empirical findings, international tourist arrivals are expected to contribute positively to economic growth.

H1: The arrival of international tourists has a positive impact on economic growth.

Multiplier Effect Theory

The multiplier effect theory explains that economic activities produced by certain sectors are able to create a wider impact on other sectors in the economy. In the context of tourism, tourist spending not only provides direct benefits to tourism businesses but also produces indirect and inductive effects on transportation, trade, restaurants, local services, and other supporting industries. As a result, the development of tourism activities contributes to the circulation of income and creates a wider economic impact throughout the region.

Tourism is recognized as one of the sectors that has a strong multiplier effect because tourism activities involve many interrelated industries. Increasing demand for accommodation, transportation, culinary businesses, and leisure facilities is stimulating economic activity in various sectors. This process encourages business expansion, creates job opportunities, and increases household income, thereby contributing to the region's economic growth. Therefore, tourism is considered an important sector that is able to support sustainable economic development.

One of the indicators commonly used to assess tourism performance is the hotel occupancy rate. Hotel occupancy rates reflect the extent to which accommodation facilities are used by tourists over a period of time. Higher hotel occupancy rates indicate increased tourism activity and stronger demand for accommodation services. This condition can increase hotel revenue and encourage the development of supporting sectors such as restaurants, transportation services, souvenir businesses, and other local industries. As a result, the increased use of accommodation facilities can contribute positively to regional economic performance.

In addition, the high occupancy rate of hotels shows that tourism destinations are able to attract visitors and maintain tourism activities. Along with the increasingly active tourism business, job opportunities and income circulation in the local economy also tend to increase. Through the multiplier effect mechanism, tourism spending can stimulate production activities and encourage the expansion of economic sectors related to tourism. Therefore, hotel occupancy rates are often considered one of the important indicators that reflect tourism's contribution to economic growth.

Several previous studies have found that hotel occupancy rates have a positive impact on economic growth as increased accommodation utilization indicates higher tourism demand and stronger economic interaction between tourism-related sectors. Higher hotel occupancy rates generally boost business productivity and increase regional revenue. However, some empirical findings reveal that the impact of hotel occupancy rates can vary between regions depending on the quality of tourism infrastructure, accommodation facilities, and regional economic conditions. In areas where tourism activities are highly developed, the contribution of hotel occupancy rates to economic growth tends to be more substantial.

Based on the multiplier effect theory and supported by findings from previous research, hotel occupancy rates are estimated to have a positive effect on economic growth. Increased utilization of accommodation facilities can strengthen tourism activities, stimulate income circulation, and create broader economic impacts that support regional economic development.

H2: Hotel occupancy rates have a positive impact on economic growth.

Tourism-Led Growth Hypothesis (TLGH)

The Tourism-Led Growth Hypothesis (TLGH) explains that tourism activities can be one of the important driving forces behind economic growth. Through tourism development, regions are able to generate income, create jobs, encourage investment, and encourage the development of supporting industries. Tourism not only contributes directly through spending made by visitors, but also generates broader economic impact through intersectoral interactions related to accommodation, transportation, trade, and local services. Therefore, tourism is considered a strategic sector that is able to support sustainable economic development.

One indicator that reflects tourism activities is the average length of stay. Average length of stay refers to the length of time that tourists spend in a destination during their visit. The longer tourists stay in a destination, the greater the opportunity for them to consume the goods and services provided by local businesses. This condition can increase spending on accommodation, transportation, food and beverages, shopping activities, and tourist attractions. As a result, longer stays are expected to contribute positively to income circulation and strengthen economic activity in the region.

According to the Tourism-Led Growth Hypothesis, tourism spending serves as one of the channels through which tourism contributes to economic growth. Travelers who spend more time in a destination generally have higher consumption rates compared to those who stay for shorter periods of time. Increased tourist consumption can stimulate tourism-related business growth and encourage the expansion of supporting industries. In addition, higher tourism spending can create additional job opportunities and improve the well-being of local communities, thereby contributing to the economic performance of the region.

The average length of stay is also considered an indicator that reflects the attractiveness and competitiveness of a tourism destination. Destinations that are able to retain tourists for a longer period of time usually provide diverse tourism products, adequate infrastructure, and quality services. These factors are expected to increase tourism revenue and strengthen the role of the tourism sector in encouraging economic growth. Therefore, improving the quality of tourism services and the attractiveness of destinations is essential to encourage tourists to extend their stay and generate greater economic benefits.

Several previous studies have reported that average length of stay positively affects tourism revenue and economic growth because longer stays are associated with greater tourism spending and stronger economic interactions among tourism-related sectors. However, other empirical studies have shown

different findings, suggesting that longer stays do not necessarily guarantee higher economic growth. Variations in tourist spending patterns, the quality of infrastructure, and the regional economic structure can affect the extent to which the average length of stay contributes to economic performance. In some cases, tourists may stay longer but spend relatively less time, thus limiting the contribution of tourism activities to economic growth.

Based on the Tourism-Led Growth Hypothesis and supported by previous empirical findings, the average length of stay is expected to have a positive effect on economic growth. Longer stays can increase tourism spending and strengthen economic activities in various sectors, which in turn contributes to the economic development of the region.

H3: The average length of stay has a positive impact on economic growth.

Conceptual Framework

Based on the Tourism-Led Growth Hypothesis (TLGH) and multiplier effect theory, tourism activities are expected to contribute positively to regional economic growth. International tourist arrivals, hotel occupancy rates, and average length of stay are considered important indicators that reflect tourism performance and development. The increase in tourism activities is expected to encourage consumption, expand business opportunities, and create a multiplier effect in all tourism-related sectors, thereby supporting economic growth in North Sumatra Province.

The arrival of international tourists shows the number of foreign visitors entering North Sumatra Province and is expected to increase tourism spending and regional economic activities. Hotel occupancy rates reflect the utilization of accommodation facilities and indicate the intensity of tourism activities. Meanwhile, the average length of stay represents the duration of a tourist's stay and is associated with the level of tourism expenditure generated during their visit. Therefore, this tourism indicator is hypothesized to positively affect economic growth.

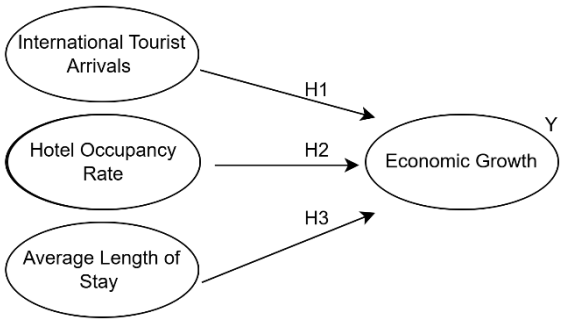

Figure 1. Conceptual Framework

METHODOLOGY

This study uses a quantitative research approach to investigate the relationship between tourism indicators and economic growth in North Sumatra Province during the period 2015–2024. The research uses secondary time series

data obtained from official publications issued by the Central Statistics Agency (BPS). The ten-year observation period was chosen to provide a comprehensive overview of tourism development and its contribution to economic growth in North Sumatra Province.

The object of this research is North Sumatra Province, which has considerable tourism potential and functions as one of the important tourist destinations in Indonesia. Three independent variables and one dependent variable were included in this study. Economic growth, measured by the growth rate of Gross Regional Domestic Product (GDP), is used as a dependent variable. Meanwhile, international tourist arrivals, hotel occupancy rates, and average length of stay are used as independent variables that represent tourism performance. The arrival of international tourists reflects the number of foreign visitors entering North Sumatra Province, while hotel occupancy rates reflect the utilization rate of accommodation facilities. In addition, the average length of stay shows the average duration spent by tourists during their visit.

To analyze the relationship between tourism indicators and economic growth, this study uses multiple linear regression analysis. This method was chosen because it allows an examination of the individual and simultaneous effects of international tourist arrivals, hotel occupancy rates, and average length of stay on economic growth. Data processing and statistical analysis are carried out using EViews software. The regression model used in this study is stated as follows:

$$Y=a+b1X1+b2X2+b3X3+E$$

where Y represents economic growth, α represents a constant time frame, β1, β2, and β3 are regression coefficients, X1 refers to international tourist arrivals, X2 represents hotel occupancy rates, X3 represents average length of stay, and ε indicates error terms.

To obtain reliable estimation results, some classical assumption tests are performed after estimating the regression model. This test consists of normality, multicollinearity, heteroskadasticity, and autocorrelation tests. Furthermore, hypothesis testing is carried out using the t-test to determine the partial influence of each independent variable on economic growth, while the F-test is applied to examine the simultaneous influence of all independent variables. In addition, the determination coefficient (R^2) is used to evaluate the explanatory power of the regression model. Through this analysis procedure, this study seeks to provide empirical evidence regarding the contribution of tourism indicators to economic growth in North Sumatra Province.

RESULTS

Empirical findings from this study examining the influence of international tourist arrivals, hotel occupancy rates, and average length of stay on economic growth in North Sumatra Province during 2015–2024 are presented in this section. The EViews software is used to estimate regression models and perform classical assumption tests and hypothesis testing. The following subsection

provides a comprehensive explanation of the statistical results obtained from the analysis.

Table 1. Multiple Linear Regression Results

Variabel	Coeficin	t-Statistics	Probability
C	0,745903	0,240693	0.8178
X1	-9,33E-07	-0,882623	0.4114
X2	0.233406	4.644851	0.0035
X3	-4.704946	-2..266224	0.0640

Source : Eviews 12 (data processed)

The regression results show that the occupancy rate of hotel rooms (X2) has a positive and significant influence on economic growth. Meanwhile, the number of foreign tourist visits (X1) and the average length of stay (X3) have a negative but not significant effect on economic growth.

The value of the determination coefficient (Adjusted R^2) of 0.754851 shows that 75.49% of the variation in economic growth can be explained by variables such as the number of foreign tourist visits, hotel room occupancy rates, and average length of stay, while the remaining 24.51% is explained by other variables outside the research model.

The F-statistical probability value of 0.008943 (<0.05) indicates that all independent variables simultaneously have a significant effect on economic growth.

Table 2. Classical Assumption Test Results

Test Type	Indicator	Results
Normality Test	Prob. Jarque-Bera	>0,05
Multicollinearity Test	Centered VIF X1 = 1325831	<10
	Centered VIF X2 = 1,280900	<10
	Centered VIF X3 = 1,433991	<10
Heteroscedasticity Test	Prob. Obs*R-Squared	>0,05
Autocorrelation Test	Prob. Obs*R-Squared	>0.05

Source : EViews 12 (data processed)

Based on Table 2, the results of the classical assumption test show that the regression model has met the assumption of normality, does not experience problems of multicollinearity, heteroscedasticity, or autocorrelation. Thus, the regression model used in this study can be said to meet the criteria of the Best Linear Unbiased Estimator (BLUE).

Table 3. Hypothesis Test Results

Variabel	t-Statistics	Probability
X1	-0,882623	0,4114
X2	4,644851	0,0035
X3	-2,266224	0,0640
Prob (F-statistic)	-	0,008943
Adjusted R2	-	0,754851

Source : EViews 12 (data processed)

Based on Table 3, the occupancy rate of hotel rooms (X2) has a positive and significant effect on economic growth. Meanwhile, the number of foreign tourist visits (X1) and the average length of stay (X3) have a negative but not significant effect on economic growth. In addition, the F-statistical probability value of 0.008943 shows that all independent variables simultaneously have a significant effect on economic growth. The Adjusted R^2 value of 0.754851 indicates that 75.49% of the variation in economic growth can be explained by variables in the model, while the rest is influenced by other factors outside the study.

DISCUSSION

The Effect of the Number of Foreign Tourist Visits on Economic Growth.

The number of foreign tourist visits is one of the indicators that is often used to describe the development of the tourism sector in a region. The more foreign tourists visit, the greater the opportunity to create economic activities through increased consumption, the use of transportation services, accommodation, trade, and other supporting sectors. However, the results of this study show that the increase in the number of foreign tourist visits has not been able to have a meaningful influence on the economic growth of North Sumatra Province. This indicates that the increase in the number of tourists who come has not been fully able to be converted into a significant increase in economic added value for the region.

This condition can be caused by various factors, one of which is the lack of optimal linkages between the tourism sector and other economic sectors. The presence of foreign tourists can indeed increase economic activity, but if tourist spending is relatively limited or the economic benefits generated are only concentrated in certain sectors, then the impact on overall economic growth will be less than optimal. In addition, differences in tourist characteristics, consumption patterns, and the limited development of value-added tourism products and services can also be the cause of the suboptimal contribution of the tourism sector to the regional economy.

Theoretically, the Tourism-Led Growth Hypothesis (TLGH) explains that the tourism sector can be one of the drivers of economic growth through increased foreign exchange revenues, expansion of employment opportunities, and the development of various economic activities related to the tourism industry (Balaguer & Cantavella-Jordá, 2002, Brida et al., 2016). However, these influences do not always occur directly and can vary from region to region. In the context of North Sumatra Province, the results of this study show that the increase in the

number of foreign tourists has not been able to have a significant impact on economic growth. Thus, the large number of tourists who come is not always a guarantee of increased economic growth if it is not followed by the ability of the region to optimize the economic potential of the tourism sector.

The findings of this study are in line with several previous studies that stated that an increase in the number of tourists is not always followed by an increase in economic growth (Brida et al., 2016). Therefore, efforts to develop the tourism sector in North Sumatra Province not only need to be focused on increasing the number of tourist visits, but must also be accompanied by improving the quality of destinations, developing more diverse tourism products, and strengthening the linkage between the tourism sector and other economic sectors. Thus, the economic benefits generated from tourism activities are expected to make a greater contribution to regional economic growth.

The Effect of Hotel Room Occupancy Rate on Economic Growth.

The occupancy rate of hotel rooms is one of the indicators that can describe the level of activity of the tourism sector in an area. The high occupancy rate of rooms shows that there is an increase in demand for accommodation services which will indirectly encourage the development of other sectors related to tourism activities. The results of this study show that the occupancy rate of hotel rooms has a positive influence on the economic growth of North Sumatra Province. The findings indicate that the increase in hotel room occupancy rates tends to be followed by an increase in economic activity which is ultimately able to encourage regional economic growth.

This relationship can be explained through the concept of multiplier effect which states that economic activities arising from the tourism sector not only benefit the main sector, but also impact other supporting sectors (Archer, 1982). The increase in hotel room occupancy rate will increase the demand for transportation services, restaurants, trade, and various micro and small businesses related to tourism activities. Thus, increasing activity in the hospitality sector can create a wider economic turnaround and contribute to increasing people's income and regional economic growth.

Theoretically, the multiplier effect explains that any increase in tourist spending will produce a chain impact on various sectors of the economy (Archer, 1982). The high occupancy rate of hotel rooms reflects the increase in tourism activities that have the potential to create jobs, increase the income of business actors, and expand economic opportunities for the community. Therefore, the development of the hotel industry has an important role in supporting economic growth, especially in areas that have considerable tourism potential such as North Sumatra Province.

The results of this study also support several previous studies that stated that the hospitality sector has a considerable contribution to economic growth (Brida et al., 2016). The high occupancy rate of hotel rooms shows that tourism activities are not only limited to the increasing number of tourists, but also reflected in the large utilization of available accommodation facilities. Thus, the development of the hotel sector, improving service quality, and strengthening the

attractiveness of tourist destinations are important factors that need to be considered in an effort to increase regional economic growth. Therefore, the hotel sector can be seen as one of the sectors that has a strategic role in supporting economic development in North Sumatra Province.

The Effect of Average Length of Stay on Economic Growth.

Average length of stay is one of the indicators used to describe the intensity of tourist activities while in the tourist destination area. The longer tourists spend in an area, the greater the chance of spending on accommodation, consumption, transportation, and various other needs that can have an impact on the regional economy. However, the results of this study show that the average length of stay has not been able to have a meaningful influence on the economic growth of North Sumatra Province. This shows that the length of stay of tourists is not always followed by an increase in economic activity that is able to drive significant economic growth.

This condition can occur because the magnitude of the economic impact generated by tourists is not only determined by the length of stay, but also influenced by the spending patterns of tourists during their visit. Tourists who spend longer do not necessarily have high levels of consumption, so the additional length of stay does not necessarily result in a significant increase in income for sectors of the economy related to tourism. In addition, the possibility that there is still a limited variety of tourism products and economic activities that tourists can enjoy while in North Sumatra can also cause the economic benefits obtained from increasing the length of stay to be less optimal.

Based on the multiplier effect theory, tourism activities should be able to create a chain impact on various economic sectors through increasing tourist spending (Archer, 1982). However, in practice, the magnitude of this impact is greatly influenced by the ability of the region to provide products and services that are able to encourage an increase in tourist consumption. Therefore, an increase in the average length of stay will not necessarily be able to directly increase economic growth if it is not followed by improving the quality of destinations, developing diverse tourism products, and strengthening the linkage between the tourism sector and other economic sectors.

The findings of this study are in line with several previous studies that showed that the length of a tourist's stay does not always make a significant contribution to economic growth (Brida et al., 2016). Thus, efforts to develop the tourism sector in North Sumatra Province not only need to be focused on increasing the duration of tourist visits, but also on improving the quality of services, providing more diverse tourist attractions, and developing creative industries and other supporting businesses. With this synergy, the economic benefits generated from tourism activities are expected to make a greater contribution to regional economic growth.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the study, it can be concluded that the occupancy rate of hotel rooms is a variable that has a positive and significant influence on the economic growth of North Sumatra Province. Meanwhile, the number of foreign

tourist visits and the average length of stay have not shown a significant influence on economic growth. Nevertheless, together the three tourism indicators are able to influence regional economic growth. These findings show that the tourism sector still has an important role to play in supporting economic development, especially through activities related to the accommodation sector and other supporting services.

Based on these results, local governments are expected to continue to encourage the development of the tourism sector through improving the quality of tourist destinations, strengthening supporting infrastructure, and improving the quality of services in the hospitality sector and other tourism services. In addition, efforts to increase tourist spending during visits also need to be made through the development of more diverse and value-added tourism products so that the economic benefits produced can be felt more widely by the community.

For further research, it is recommended to add other variables that are suspected to affect economic growth, such as investment, the number of domestic tourists, tourist spending, or tourism sector revenue. In addition, the use of longer research periods and different analysis methods is expected to provide more comprehensive results in explaining the relationship between the tourism sector and economic growth.

FURTHER STUDY

This study still has some limitations, especially in the number of variables used and the relatively limited observation period. Therefore, further research is expected to develop a research model by adding other variables related to the tourism sector and macroeconomic factors, such as the number of domestic tourists, investment, tourist spending, inflation, and tourism sector income. In addition, the use of a longer research period and the application of different analysis methods are expected to provide a more comprehensive picture of the role of the tourism sector in encouraging regional economic growth.

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