

THE EFFECT OF INTERNATIONAL TOURIST ARRIVALS ON REGIONAL DEVELOPMENT IN EAST NUSA TENGGARA (NTT) PROVINCE

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Received: June 05, 2023. Approved: October 20, 2023. Published: December 18, 2023

Abstract

The government of Indonesia has established Komodo National Park as one of the priority tourist destinations since 2015 to stimulate the number of international tourist arrivals to Komodo National Park, located in West Manggarai Regency, East Nusa Tenggara Province (NTT). This study aims to analyze the spillover effect of the surge of international tourists in Komodo National Park and its impact on the regional economy in NTT. This study used the Spatial Autoregressive (SAR) and Spatial Durbin Model (SDM) methods on district-level data from 2012 to 2018 and found that the surge of international tourists visiting Komodo National Park had a positive and significant spillover effect on the increase of tourism activities in other tourist destinations in NTT. The rise of tourism activity impacted regional economic growth significantly in West Manggarai Regency and other districts in NTT, and the tourism growth positively influenced the regional economic convergence in NTT.

Keywords: *Komodo National Park, spillover effect, tourism activity*

INTRODUCTION

The tourism industry is driving sectors for economic growth in Indonesia and accounted for 7.19% of Indonesia's GDP in 2019 (BPS, 2021). WTTC (2021) deemed that tourism accounted for 5.9% of GDP (directly and indirectly). The tourism sector has grown influential due to the increasing of international tourists arrivals in Indonesia. The number of international tourist arrivals in 2012 only amounted to 8.04 million, and the number reached 15.81 million in 2018. Therefore, the tourism stimulates economic growth, job creation, and foreign exchange earnings in other economic sectors as a result of a multiplier effect.

To invite international tourist arrivals to Indonesia, the Government of Indonesia has identified ten priority international tourist destinations as detailed in the tourism strategic goals of the 2020–2024 RPJMN. Komodo National Park is one of the ten priority tourism destinations. It is located in Labuan Bajo, West Manggarai, Flores Island, East Nusa Tenggara Province (NTT). The cumulative growth of international tourists arriving NTT has climbed by 355% from 2012 to 2018, or an average of 59% per year, since Komodo National Park was designated as a priority destination in 2015 (see Figure 1).

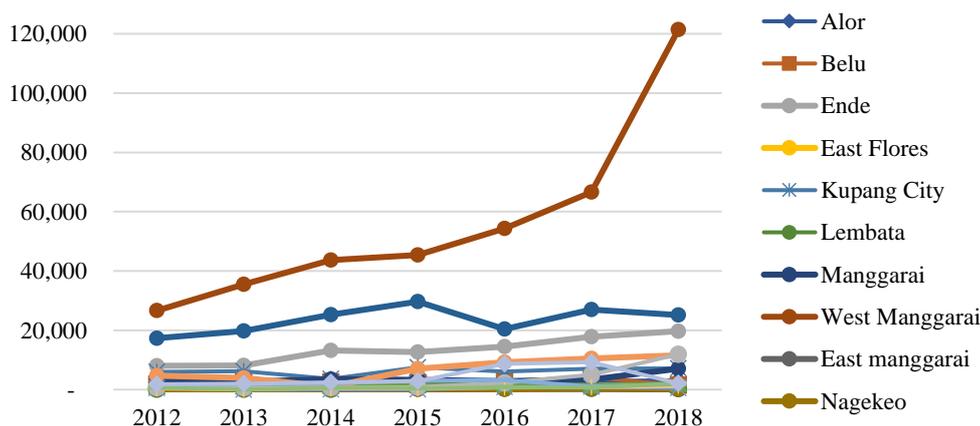


Figure 1. Increasing Trend of International Tourists Arrivals of West Manggarai and Its Surrounding Areas in 2012–2018

Source: Adapted from BPS, 2018

Regions geographically adjacent to West Manggarai Regency, such as Ngada, Sikka, and Ende Regencies, have also experienced an increase in tourist arrivals by 44.93%, 149%, and 145.55% in 2012 - 2018, respectively. It is in line with the findings of Ismayanti et al. (2020), who explained that most international tourists arriving the Komodo National Park would visit other tourist destinations on Flores Island, such as Ngada and Ende, proving that there is indeed a *spillover effect* from international tourists arriving Labuan Bajo to neighboring regions in NTT.

The international tourist arrivals to Komodo National Park also boost economic growth in the NTT. West Manggarai's economic growth only amounted to 3.83% in 2012 and rose to 5.54% in 2018. It demonstrates how the spillover effect of international tourists arriving West Manggarai, Ngada, Sikka, and Ende has contributed to the region's economic

growth. Komodo National Park has provided economic opportunities for the people of West Manggarai and impacted other regions' economies in NTT. The phenomenon is known as the spatial effect (Anggraini, 2016; Vidyattama, 2006). Thus, the spillover effect of international tourists causes spatial effects between regions in NTT. Therefore, tourism development reduces the gap in regional economic development in NTT.

Most research on tourism economics focuses on the relationship between tourism, economic growth, and the factors that influence international tourist arrivals. Yakup (2019) and Nizar (2015) determined a two-way positive association between tourism and economic growth based on data at the provincial level. Rachmawati (2019), who investigated the tourism sector in NTT, concluded that tourism influences the economy positively. Bayram (2020), Marrocu and Paci (2013), and Muryani et al. (2020), who analyzed the factors that influence tourists arriving a tourist destination, concluded that the availability and quality of accommodation and restaurants had a significant impact on tourist visits. Previous studies are conducted on the spillover effect of tourist arrivals (Budirahmayani & Khoirunurrofik, 2019; Paci & Marrocu, 2014; Yang & Wong, 2012). The studies found that international tourist arrivals had a positive spillover effect on the economies of other regions (Budirahmayani & Khoirunurrofik, 2019; Paci & Marrocu, 2014). Yang dan Wong (2012) concluded that there was a spillover effect on the regional economy of 341 cities in China due to international tourist arrivals. Another research that looked into the relationship between the tourism sector and the convergence of regional economic development with a spatial approach by Ma et al. (2015). The study analyzed the spillover effects of tourism on economic growth and the convergence of regional economic development using spatial analysis methods and β -convergence models. The study, which used data from 272 prefecture-level administrative in China, found a spillover effect and the convergence of regional economic development in China due to the spillover effect of tourism. Similarly, Mamipour dan Abdi (2017) found the tourism spatial effects on several provinces in Iran.

Meanwhile, there has yet to be research in Indonesia about the relationship between international tourist arrivals and regional economic convergence in the context of spatial analysis. The research aims to analyze the spatial effect of Komodo National Park tourism development on international tourist arrivals and regional economic growth in NTT. This study determines the tourism spatial effect on the convergence of regional development in NTT. The issue of spatial effects is crucial to examine since spatial effects uplift other regions in NTT without any potential tourist destinations and help other regions' economic growth through the spillover effects of tourism.

The framework for this research is that the establishment of the Komodo National Park as a priority destination has stimulated international tourist arrivals to West Manggarai. The increase in arrivals influences directly and indirectly the local economy, resulting in *spillover effects* experienced by other regions in NTT. The increase in tourists arriving West Manggarai will also increase arrivals to other regions in NTT. Through the *multiplier* effect, a rise in tourist visits will impact on other economic sectors positively, both for the region itself and its neighbors (Maulana, 2016). This effect, in aggregate, is expected to increase regional economic growth and encourage the convergence of regional economic development in NTT. Figure 2 illustrates this study's framework in further detail.

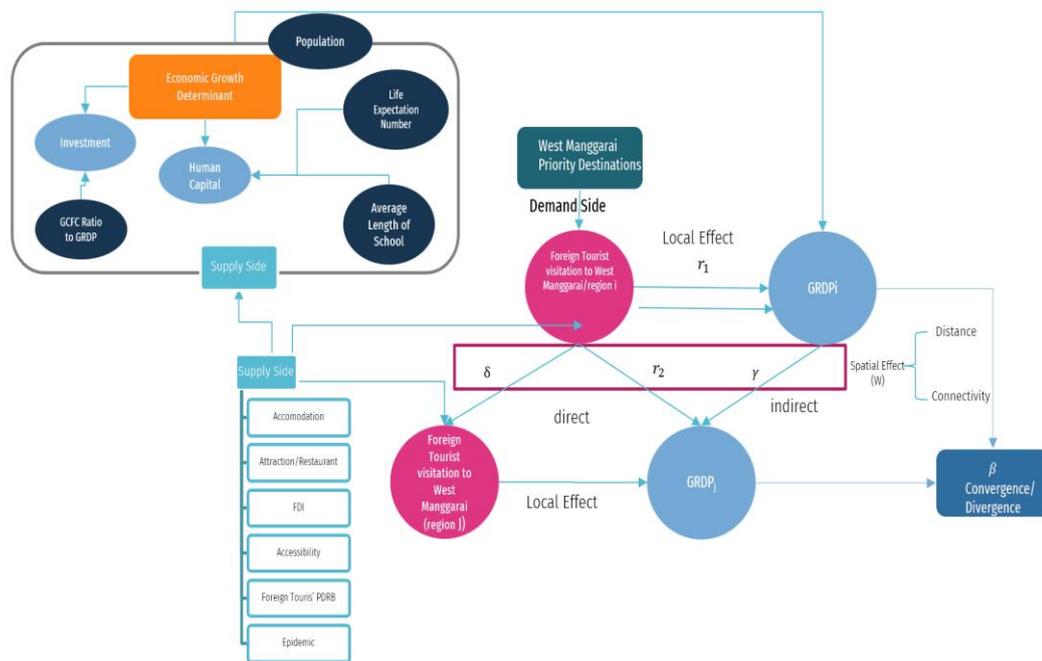


Figure 2. Conceptual Framework
Source: Author's illustration, 2023

In this study, regional economic development by Gross Regional Domestic Product (GRDP), influenced by the number of international tourist arrivals, is the variable of interest, on top of other variables. In econometric modeling, other variables that affect dependent variables are not the major subject of research are referred to as control variables. The control variables in this study (variables that affect international tourist arrivals) are chosen based on past research findings, including life expectancy, average length of school, population, and Gross Fixed Capital Formation (GFCF). Life expectancy, as a proxy for human capital factors in a region, is expected to yield a positive outcome on economic growth (Achmad, 2017; He & Li, 2020). However, the rise in life expectancy negatively impacts per capita income since an increase in life expectancy is accompanied by a high dependency ratio that instead lowers per capita income (Leung & Wang, 2010). Several studies that use the average years spent in school as a proxy for human resources in influencing economic growth found that the average years spent in school significantly impacted economic growth (Abdullah & Asrirawan, 2021; Klasen & Lamanna, 2009). Investment, proxied by GFCF, is expected to yield both positive (Amri & Aimon, 2017; Long & Pasaribu, 2019) and negative outcomes on the economy (Fahmi & Achjar, 2015; Sulistiawati, 2012). Another determinant factor that distinguishes economic growth between regions is population. The population could negatively affect economic growth, depending on the productivity of the residents in the area. Rapid population growth in areas with low per capita income can lead to stunted economic growth within those areas (Malthus et al., 2018; Peterson, 2017). It is due to the imbalanced population structure that causes dependence and limitations on natural resources to meet the needs of the population (Malthus et al., 2018).

METHODOLOGY

This research uses a spatial econometrics approach to examine economic linkages between regions. This study utilizes two spatial econometrics models to gradually measure the spillover effect of international tourist arrivals on economic growth. The first model evaluates spillover effects from the tourism sector's demand side, specifically tourist arrivals. The expected direction of the relationship is positive, meaning that an increase in tourists visiting Komodo National Park leads to a rise in tourists visiting neighboring regions. The second model uses beta convergence (β – convergence) combined with spatial analysis to see how the tourism sector contributes to interregional economic growth in NTT. The models used will refer to the models developed by Barro and Sala-I-Martin (1992), del Bo et al. (2009), and Haller et al. (2021). All models are estimated using panel data econometrics. The two models used in this study are outlined in more detail as follows.

Spillover Effect of Tourist Visits on Economic Growth Model

This model develops to answer the first research question regarding the spatial effects of tourist arrivals on other regions. Model 1 is used to examine the spatial effect of international tourist arrivals ($\ln Foreign$). The spatial effect is represented by a coefficient of $\delta 1$, which describes the spatial effect of international tourist arrivals. $\delta 2 \ln accom_{it}$ dan $\delta 3 \ln rest_{it}$ determines the availability of accommodation and restaurant that will logically affect international tourist visits. The W weight captures spatial effects using two approaches, namely distance and connectivity.

$$\ln Foreign_{it} = \delta 1 W \ln Foreign_{it} + \delta 2 \ln accom_{it} + \delta 3 \ln rest_{it} + u_{it} \quad \dots (1)$$

The following model analyzes the impact of economic growth from the increasing number of international tourists arrivals Komodo National Park in West Manggarai Regency on other regions with or without involving other determinants of economic growth.

$$\ln \left(\frac{grdp_{it+1}}{grdp_{it}} \right) = \beta \ln grdp_{it} + \gamma W \ln \left(\frac{grdp_{it+1}}{grdp_{it}} \right) + u_{it} \quad \dots (2)$$

Model 2 uses the *Spatial Autoregressive* (SAR) model to examine the impact of one region's economic growth on other regions and examine economic convergence in NTT without involving other economic growth determinants. If the estimated $\gamma > 0$, it indicates a spatial effect of economic growth in a region. The expected β value is negative. This β parameter tests the convergence of economic development in a region. The negative value of the β coefficient means that regions with lower economic growth will grow faster to catch up with more developed regions. Thus, the parameter β can measure how rapidly a region processes its economic growth in chasing economic equality. In Model 2, i represents district/city and t represents Year while u_{it} is the error value from the model above. $\ln(grdp_{it+1}/grdp_{it})$ presented the GRDP growth rate in district i in the period $t+1$.

$$\ln\left(\frac{grdp_{it+1}}{grdp_{it}}\right) = \beta \ln grdp_{it} + \gamma W \ln\left(\frac{grdp_{it+1}}{grdp_{it}}\right) + \Sigma \delta Control_{it} + \Sigma \tau W Control_{it} + u_{it} \quad \dots (3)$$

Model 3 determines the impact of regional economic growth and examine potential economic convergence in NTT involving other determinants of economic growth and without involving the effects of tourism growth. Model 3 uses the *Spatial Durbin Model* (SDM), which includes spatial weights on independent variables to estimate the β conditional convergence and control variables as determinants of economic growth. If the δ and τ variables yield a positive and significant outcome, it means that there is a direct and spatial effect of the control variable on regional economic growth. If the results in Model 3 are more convergent than the previous model, the control variables are influential in reducing gaps between regions.

$$\ln\left(\frac{grdp_{it+1}}{grdp_{it}}\right) = \beta \ln grdp_{it} + \gamma W \ln\left(\frac{grdp_{it+1}}{grdp_{it}}\right) + r_1 \ln Foreign_{it} + r_2 W \ln Foreign_{it} + \Sigma \delta Control_{it} + \Sigma \tau W Control_{it} + u_{it} \quad \dots (4)$$

Model 4 understands the impact of a region's economic growth on the region itself and examine economic convergence in NTT using other determinants of economic growth, including the effects of tourism growth. Model 4 estimates β conditional convergence by adding the variables of international tourist arrivals. Variables $r_1 \ln Foreign_{it}$ and $r_2 W \ln Foreign_{it}$ analyze the effect of international tourist arrivals on economic growth. If the values of r_1 and r_2 are positive and significant, it means that there is a direct and tourism spatial effect on each region's economic growth. If the β -convergence coefficient moves in a negative direction, it indicates that the tourism sector encourages convergence, which means that the coefficient successfully lowers regional economic disparities in NTT. The variable descriptions of the models are in Table 1.

Variables and Data Sources

This study applies spatial analysis connected with geospatial data using Stata version 16 (Belotti & Hughes, 2017). Models 1 to 4 are estimated using the regression panel data from 19 regencies/cities in NTT in the period 2012 – 2018. The method used is the *fixed effect estimation* method, while the source of the data and the description of the variables used in this study are as follows.

Table 1. Description of Variables and Data Sources Used in the Model

No	Variable	Description	Data Sources
1.	$\ln grdp_{it}$	The natural logarithm of the real GDP per capita of the region i year t .	GDP per capita Constant Price (BPS)
2.	$\ln Foreign_{it}$	Natural logarithm of the international tourist arrivals to the region i year t .	Database Pariwisata NTT (Dinas Pariwisata NTT)
3.	$\ln accom_{it}$	Natural logarithm of Number of Rooms available in the region i year t .	Statistics Number of Accommodations, Number of Rooms (BPS)
4.	$\ln rest_{it}$	Natural logarithm of the number of restaurants in the region i year t .	Number of Restaurants (CPM)

No	Variable	Description	Data Sources
5.	$ratfgcf_{it}$	Ratio of Gross Fixed Capital Formation to Regional GDP of the region i year t .	Gross Fixed Capital Formation (BPS)
6.	$lnEduc_{it}$	Interaction of spatial weighting matrix (W) and Average Years Spent in School of the region i year t .	Average Length of School (BPS)
7.	$lnlifeexp_{it}$	The natural logarithm of the regional life expectancy of the region i year t .	Life Expectancy (BPS)
8.	$lnpop$	The natural logarithm of the resident population in the region i year t .	Total Population (BPS)

Source: Author's processing result, 2023

The variable used to measure the convergence of economic growth is the real GRDP per capita of each regency/city. GRDP per capita is calculated based on real GRDP divided by population. The dependent variable $Ln(grdp_{it+1}/grdp_{it})$ calculates inter-year economic growth in the region and in a natural logarithm with a *time lag* of 1 year. The measurement of the natural logarithm shape is to understand the nonlinear relationship between the dependent variable and the independent variable. Changing variables in log form makes nonlinear relationships more effective while maintaining a linear model (Benoit, 2011). The main independent variable used is the number of international tourist arrivals as a proxy of the tourism sector.

The control variables included are determinants of economic growth, namely Gross Fixed Capital Formation (GFCF) as a proxy for investment, life expectancy (Handayani et al., 2016), and average years spent in school as a proxy for human resource factors as well as population to capture differences in characteristics between regions. Each variable is examined for its relation to economic growth, locally and spatially. However, the average length of school cannot be examined for its relation to local economic growth since the sample data is insufficient and less variable.

FINDINGS AND DISCUSSION

Figure 3 shows the relationship between economic growth and tourist arrivals spatially in NTT. Regions on Timor Island, such as Kupang City and the surrounding areas, have an above-average economic growth compared to other regencies/cities in NTT. The regencies with a high GRDP per capita are Ende and Ngada. The surrounding area has a below-average income per capita. Unfortunately, West Manggarai and East Manggarai are relatively low income per capita. Classified areas that also have low GRDP per capita are Lembata and Sabu Raijua regencies, located on separate islands, thus they do not have geographically adjacent neighbors. This fact confirms a strong relationship between tourism activities in a region and its economic conditions. Areas with developed tourism tend to have higher income per capita than areas with undeveloped tourism sectors.

Meanwhile, international tourists tend to visit certain areas in NTT, such as West Manggarai, Ngada, Ende, and Sikka, which result in these regions having a more developed tourism sector. They are superior in tourism and close to one another, making it accessible for tourists to go, from side to side, between regions. This fact is in line with the findings of Yang and Fik (2014), who examined the spillover effect of tourism in 342 Chinese cities,

where tourism growth has a positive spatial correlation, resulting in spillover effects. Marrocu dan Paci (2013), who analyzed tourist visits in 107 regions in Italy, also found spatial dependence caused by regional proximity factors. The results discussed above are consistent with the findings of Anggraini (2016), who asserted that complementary effects occur in neighboring areas. This is demonstrated by the rise in tourist visits in a specific region, which elevated tourist visits to nearby areas.

However, East Manggarai, Flores Timor, and Nagekeo are of a different case. While the regions are within proximity to each other and each region is often visited by tourists, these regions do not receive international tourist ‘spillover.’ This can be due to the lack of tourist attractions to compete with regions that have better tourist attractions.

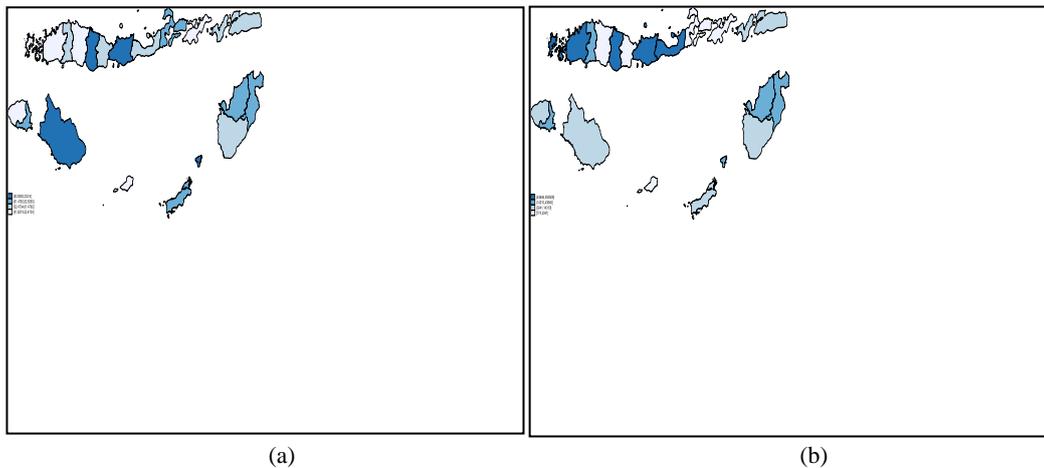


Figure 3. Distribution of Economic Growth (a) and International Tourist Arrivals (b) 2012-2018
Source: Author's Illustration based on BPS (2019)

Economic growth and tourist arrivals also have a positive correlation (See Figure 4). Kupang City, Kupang Regency, Ende, and Sikka have high tourist arrivals and high economic growth. Otherwise, Rote, Sabu Raijua, and Lembata have low tourist arrivals and relatively low economic growth. West Manggarai Regency has a relatively high average tourist arrivals, but its economic growth is still in the third *layer*, even smaller than its neighboring area, Manggarai Regency. West Manggarai has shown an increasing trend of economic growth in the past few years, even though its economics growth is low.

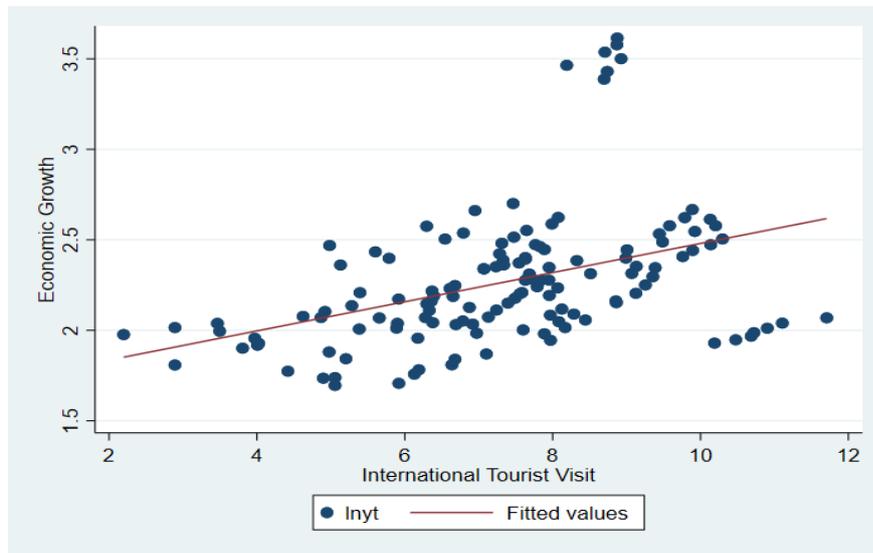


Figure 4. The Relationship between International Tourist Arrivals and Economic Growth
 Source: Author's processing result, 2023

Spillover Effect of International Tourist Arrivals

Spillover effect testing using the SAR model shows a positive spatial correlation between regions due to international tourist arrivals. Table 2 presents the estimated results of the spatial effect of tourist arrivals, and includes control variables in the form of the number of rooms available in an accommodation and the number of restaurants. The estimated results show a positive estimation coefficient, but these results will only look significant when distance and connectivity apply to the estimation. It shows a significant spatial effect of tourist arrivals to an area, the areas that are adjacent to it, as well as other connected areas. The connectivity coefficient (*W*) of the *WlnForeign* variable, which amounts to 0.287, can be interpreted that if tourist arrivals in West Manggarai increase by 1%, tourist arrivals to other areas in NTT will increase by 0.287%. It demonstrates the spillover effect of foreign tourists arriving West Manggarai, which benefits other regions in NTT.

Table 2. Model Estimation Results

	<i>lnForeign</i>	<i>lnForeign</i>
<i>lnaccom</i>	0.568* (0.308)	0.717** (0.316)
<i>lnrest</i>	0.0862 (0.119)	0.109 (0.122)
	<i>W Distance</i>	<i>W Connectivity</i>
<i>WlnForeign</i>	0.441*** (0.137)	0.287** (0.139)
<i>sigma_e</i>	0.708*** (0.0473)	0.726*** (0.0484)
<i>pseudo R²</i>	0.532	0.546
<i>AIC</i>	255.4	260.2

Note: Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's processing result, 2023

Meanwhile, the control variables included in the model show that the accommodation availability factor, which is proxied by the number of hotel rooms in an area (*lnaccomm*), is positively and significantly influenced by international tourist arrivals (*lnForeign*) to the area. It infers that adequate accommodation facilities will be able to attract foreign tourists to visit tourist destinations in NTT, which means that availability and quality must improve to attract more visitors (Bayram, 2020; Marrocu & Paci, 2013; Muryani et al., 2020).

Furthermore, to obtain *robust* analysis results, we also anticipate the possibility of endogeneity of explanatory variables with *accommodation* and *lnresto* (restaurant), which initially expects to be related to the number of tourists. The *the lag variable t-1* (*lnlagaccomm*) in each covariate eliminates the suspicion of endogeneity (see Table 3).

Table 3. Model Estimation Results using variable lag

	(Model #1) <i>lnForeign</i>	(Model #2) <i>lnForeign</i>	(Model #3) <i>lnForeign</i>	(Model #4) <i>lnForeign</i>	(Model #5) <i>lnForeign</i>	(Model #6) <i>lnForeign</i>
<i>lnlagaccom</i>	0.317 (0.268)		0.273 (0.273)	0.430 (0.279)		0.386 (0.284)
<i>lnlagrest</i>		0.107 (0.106)	0.0851 (0.108)		0.114 (0.109)	0.0830 (0.111)
	<i>W Distance</i>			<i>W Connectivity</i>		
<i>WlnForeign</i>	0.528*** (0.123)	0.579*** (0.109)	0.534*** (0.122)	0.386*** (0.128)	0.458*** (0.113)	0.393*** (0.128)
<i>sigma_e</i>	0.715*** (0.0479)	0.712*** (0.0478)	0.712*** (0.0478)	0.739*** (0.0495)	0.738*** (0.0496)	0.736*** (0.0493)
<i>pseudo R²</i>	0.497	0.125	0.485	0.507	0.143	0.512
<i>AIC</i>	257.1	257.5	258.5	263.5	264.8	265.0

Note: *Standard errors in parentheses*
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's processing result, 2023

The main variable of the model employs data from year t with a spatial addition. The model is also tested gradually, either with individual or collective variables. By using *the t-1 lag* of the explanatory variable, the results are consistent across all models (Models #1 through Model #6). It suggests that international tourist arrivals to Komodo National Park significantly impact visits to other regions. It highlights the positive effects of high-priority tourism development, whether in increasing visitors to Komodo National Park or to other areas. Thus, establishing Komodo National Park as a superior destination increases tourist arrivals to Komodo National Park and international tourist arrivals to other regions in NTT. The results are consistent with Ismayanti et al. (2020), who claimed that most visiting Komodo National Park would visit other tourist destinations in Flores, such as Ngada and Ende.

Impact of International Tourist Arrivals on Regional Economic Growth and The Convergence of Regional Economic Development

As mentioned in the previous sections, this study examines the economic impact of international tourist arrivals on economic growth and regional economic convergence using several models with results presented in Table 4. Based on Models #3 and #6,

lnForeign and *WlnForeign* variables result in a positive-leaning coefficient, indicating that international tourist arrivals is associated with economic growth in one region and neighboring regions. The *lnForeign* coefficient of 0.000877 in Model #6 means a 0.000877% rise in local economic growth due to a 1% increase in international tourist arrivals even when other factors remain the same. Whereas, the *WlnForeign* coefficient of 0.00388 in the same model means a 0.00388% rise in other regions' economic growth due to a 1% increase in international tourist arrivals even when other factors remain the same. These findings support the conclusions stated by Budirahmayani and Khoirunurrofik (2019), Paci and Marrocu (2014), Yang dan Wong (2012), and other studies that international tourist arrivals have a positive spillover effect on the economic growth of other regions.

Models #1 and #4 in Table 4 present β absolute values (*lngrdp* coefficient, i.e., absolute convergence coefficient without the involvement of other variables), which demonstrates the divergence in economic development across regions in NTT. If control variables are applied, as presented in Models #2 and #5, the β coefficient (*lngrdp* coefficient) yields a negative result, indicating the convergence of economic growth across regions in NTT. Models #3 and #6, where international tourist arrivals are a factor, demonstrate negative and significant β coefficient results. It shows that international tourist arrivals, together with determinants of economic growth, can encourage economic convergence between regions in NTT. The results obtained in Model #3 and Model #6 also indicate that if accompanied by an increase in other independent variables, such as an increase in education, human capital, and investment, the tourism sector will produce a faster convergence rate, indicated by a negative convergence coefficient.

This finding is associated with a study conducted by Ma et al. (2015), who found that the increasing number of tourist arrivals could drive regional economic convergence. Mamipour dan Abdi (2017) presented the same results since the development of domestic tourism could increase the speed of regional economic convergence growth. Different results were found by Haller et al. (2021), who analyzed the influence of the tourism sector on economic convergence in 28 EU countries. According to Haller et al. (2021), the tourism sector could not encourage the acceleration of economic growth convergence because the economic value generated from tourism services is far inferior compared to the income obtained from other sectors (industrial sectors and other services). The conditions in the European Union is widely different from conditions in NTT. The economic sectors in NTT are generally underdeveloped, so if one sector experiences rapid development, the impact will contribute to the economy of NTT as a whole. The result is the growth in international tourists arriving Komodo National Park in NTT has significant effects on economic convergence. According to the findings of this study, if the growth in international tourist arrivals is followed by an increase in human resources and investment in the tourism sector, the convergence of regional economy will develop rapidly.

Table 4. Comparison of estimation results using *distance and connectivity approaches*

	(Model #1)	(Model #2)	(Model #3)	(Model #4)	(Model #5)	(Model #6)
<i>Dependen Variabel: Ln ($\frac{grdp_{it+1}}{grdp_{it}}$)</i>						
<i>lngrdp</i>	0.0217*** (0.00622)	-0.164*** (0.0252)	-0.165*** (0.0250)	0.0225*** (0.00561)	-0.104*** (0.0213)	-0.108*** (0.0206)
<i>lnForeign</i>			0.000593* (0.000331)			0.000877** (0.000350)
<i>Ratgfc</i>		0.0344*** (0.00947)	0.0322** (0.00937)		0.0267*** (0.0101)	0.0247** (0.00970)
<i>Lnlifeexp</i>		0.0549 (0.0794)	0.0294 (0.0778)		-0.0405 (0.0891)	-0.0258 (0.0848)
<i>Lnpop</i>		-0.165*** (0.0271)	-0.162*** (0.0264)		-0.102*** (0.0240)	-0.107*** (0.0230)
		<i>W Distance</i>		<i>W Connectivity</i>		
<i>WLn ($\frac{grdp_{it+1}}{grdp_{it}}$)</i>	0.0167 (0.209)	-0.172 (0.216)	-0.356 (0.235)	-0.0140 (0.168)	-4.33e-11 (0.167)	-0.228 (0.183)
<i>WlnForeign</i>			0.00244* (0.00134)			0.00338*** (0.00126)
<i>Wratgfc</i>		0.104*** (0.0340)	0.0793** (0.0353)		0.0665** (0.0295)	0.0496* (0.0284)
<i>Wlnlifeexp</i>		0.893*** (0.0340)	0.855*** (0.195)		0.593*** (0.201)	0.567*** (0.191)
<i>Wlneduc</i>		0.0387 (0.0315)	0.0824** (0.0370)		0.0459 (0.0282)	0.0942*** (0.0319)
<i>Wlnpop</i>		0.185** (0.0922)	0.160* (0.0903)		0.121* (0.0644)	0.0720 (0.0632)
<i>sigma_e</i>	0.00306*** (0.000203)	0.00240*** (0.000159)	0.00233*** (0.000155)	0.00306*** (0.000203)	0.00261*** (0.000173)	0.00248*** (0.000165)
<i>pseudo R²</i>	0.065	0.234	0.236	0.065	0.214	0.220
<i>AIC</i>	-990.6	-1031.3	-1033.3	-990.6	-1012.7	-1019.9

Note: *Standard errors in parentheses*

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's processing result, 2023

CONCLUSION

Based on the discussion above, it concludes that there is a positive spillover effect of international tourist arrivals to Komodo National Park, West Manggarai. The results of this study demonstrate that international tourist arrivals to Komodo National Park are associated with the rise of visitors to the surrounding regions, especially regions within proximity of the park in terms of distance and connectivity. In other words, international tourists arriving Komodo National Park will visit other tourist destinations in NTT, specifically other destinations in the neighboring regions of West Manggarai with prior connection to the park. These findings match those of Ismayanti et al. (2020), who explained that most tourists visiting Komodo National Park would visit other tourist destinations on Flores Island, for instance, Ngada and Ende.

The increase in international tourist arrivals to Komodo National Park has a positive association with the significant economic growth in West Manggarai and other

regions of NTT. It is due to the spillover effect of international tourist arrivals, in which the rise in the number of tourists arriving Komodo National Park results in the growth of other regions' economies. These findings are in line with those found in Budirahmayani and Khoirunurrofik (2019), Paci and Marrocu (2014), and Yang and Wong (2012), who all concluded that international tourist arrivals yield a positive *spillover* effect on the economic growth of other regions.

This study also discovers that the combination of tourist arrivals to Komodo National Park and other factors, such as the development of human resources, investment, and the tourism sector itself, can hasten the convergence of economic development in NTT. This conclusion follows Ma et al. (2015), who stated that the rise in tourist arrivals could encourage the convergence of economic growth among regions. The conclusion that this study arrives at regarding regional economic convergence is it will be achieved sooner if the increase in international tourist arrivals is accompanied by an increase in human resources and investment development in the tourism sector.

This study suggests several policy implications regarding tourism, specifically in the tourism sector which can be a critical instrument in regional economic growth and address regional development disparities. Developing connectivity and cooperation in tourism promotion among regions, especially between regions with underdeveloped tourism and regions with well-developed tourism, will increase international tourist arrivals and economic growth and bridge inequality in regional development. This implication is associated with Romão & Saito (2017).

The *spillover effect* from international tourist arrivals is also determined by inter-regional connectivity. The quantity and quality of inter-regional and inter-island connecting infrastructure must be improved. In practice, local governments (regencies and provinces) in NTT, in collaboration with the central government and other stakeholders, must expand land, sea, and air transportation routes to provide tourists with better, cost-effective transportation. Thus, inter-regional connectivity will further encourage tourists to visit other tourist destinations in NTT to Komodo National Park.

This study has only analyzed *spillover effects* based on international tourist arrivals but also has yet to examine other aspects, such as expenditure (international tourist shopping expense) and length of stay. Expenditure and length of stay will affect the *spillover effect* of international tourist arrivals on the regional economy. Therefore, *spillover effect* analysis that considers tourist expenditure and length of stay needs to be discussed in future studies.

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