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The Effect of Regional Economic Activities on Domestic Tourism during the Covid-19 Pandemic in Indonesia

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ABSTRACT

This study aims to investigate the how the regional economic activity measured as the agglomeration of companies affects domestic tourism during the Covid-19 pandemic, taking into account the spatial relationship between provinces in Indonesia. Spatial analysis was carried out using Moran's I test and Spatial Durbin Model. The value of Moran's I significantly positive, indicating that there is a link of tourists visits between provinces. The main variables of companies and density have a significant negative, while the labor variable has a significant positive on the number of domestic tourist visiting in a province. The results confirm that areas with high regional economic activity were less attractive to domestic tourist during the Covid-19 pandemic in Indonesia. In addition, other factors that affect domestic tourism are labor and population density. As the positive spillover findings on Indonesian domestic tourism shown in this study, the government needs to be utilized as one of the considerations in regional tourism improvement programs. This suggests that provinces especially the less developed should take full advantage of the spillover effect between provinces on tourism flows from neighboring provinces to support local tourism development.

Keywords: Agglomeration, Domestic Tourism, Economic Activities, Spatial Durbin Model, Spillover

INTRODUCTION

The worldwide spread of the COVID-19 virus in 2020 resulted in tourism facing a catastrophic crisis due to restricted inter-country migration and travel. The World Health Organization (WHO) declared the COVID-19 virus a pandemic on 11 March 2020. As a result, most tourism was halted due to an international travel ban that affected more than 90% of the world's population and extended to restrictions on public gatherings and people's mobility. Until August 2020, the number of global tourists has decreased by 65 percent when compared to the same period in 2019 (UNWTO, 2020).

The contribution of the tourism sector is quite significant for the world economy. The significant impact of the travel and tourism industry can also be seen in the level of employment. The total contribution to absorbing the world's workforce in 2019 is 10.4 percent. According to a report by The World Travel and Tourism Council (WTTC), it is estimated that the tourism sector contributes around 2.9 percent of the worldwide increase in unemployment due to the COVID-19 storm, this is equivalent to around 100.8 million jobs worldwide. The downturn felt by the tourism industry globally throughout the world has also been experienced by Indonesian tourism. In 2019, the tourism sector contributed Rp280 trillion in foreign exchange, an increase of 3.7 percent from the previous year's achievement of Rp270 trillion. The tourism sector is considered to have considerable economic linkages with other economic sectors such as hotels, restaurants, travel agents, labor, banking, construction, real estate, and so on, thus making a significant contribution to the national economy.

Tourism is an important contributor to gross domestic product, especially among developing countries. It is also supported by Tangian, Polii, and Menko (2020), who found that economic growth is highly affected by tourist's visits. However, ignoring domestic tourists is common in developing countries and policies are always directed towards international tourism. Meanwhile, the higher number of tourists in Indonesia are domestic tourists. Several studies state that domestic tourism is difficult to measure, the determinants are quite complex and data are difficult to obtain. Several studies have analyzed the impact of the pandemic on the tourism sector, including those by Malahayati, Masui, and Anggraeni (2022); Atmojo and Fridayani (2021); and Kristiana, Pramono, and Brian (2021).

This research has several contributions to the knowledge literature. First, this research enriches the literature on domestic tourism studies during the pandemic. Second, this study uses official domestic travel data to estimate the effect of economic activity on domestic tourism at the macro level covering all provinces in Indonesia. Third, this study focuses on the influence of regional economic activity, which is measured as company agglomeration, taking into account the spatial relations between provinces.

LITERATURE REVIEW

Many empirical studies related to the impact of the pandemic on tourism have been carried out in developed countries. Research conducted by Škare, Soriano, and Porada-Rochoń (2021); Arbulú, Razumova, Rey-Maquieira, and Sastre (2021); Gössling, Scott, and Hall (2020) show that the pandemic has changed society, the economy and tourism. As a strategic response to the impact of the pandemic, it is likely that domestic tourism will be the first to recover due to limited mobility and social distancing (Arbulú et al., 2021). In addition, research related to domestic tourism is less popular than international tourism. In general,

the most popular proxy variable is international tourism acceptance, due to the availability of data and the government's tendency to stimulate incoming tourism. Another thing that has rarely been taken into account in previous studies on the tourism economy is considering spatial effects. Whereas consideration of spatial effects (dependence and heterogeneity) needs to be taken into account when analyzing data at the regional level due to spillover effects between a region and its neighbors which affect the estimated value (Yandell & Anselin, 1990).

Studies that analyze domestic tourism by considering spatial influences are still rare in Indonesia. In theory, the results of this study are very useful in developing analytical methods in the tourism sector which have not been widely used in Indonesia. Analysis of regional economic activity on domestic tourism during a pandemic needs to pay attention to the spatial linkages between provinces in order to obtain an appropriate model and appropriate conclusions. In general, the literature on regional economics and tourism as a factor of regional economic development is very limited where most of the research related to regional economic development and tourism uses qualitative approaches (case studies, surveys and observations) and is local in nature (specific areas). The few quantitative studies to date that use analysis of tourism development based on spatial relationships are also very limited (Yang & Fik, 2014; Falk, Hagsten, Lin, Falk, & Hagsten, 2021).

Changes in travel behavior and tourism trends that began to shift during the COVID-19 pandemic have also been investigated in several studies using qualitative methods (Chan, 2021; Sung, Kim, & Kwon, 2021; Huang, Shao, Zeng, Liu, & Li, 2021). Chan (2021) relying on an online survey of tourism industry players in Malaysia, indicating that there is potential for domestic tourism to revive the tourism industry in Malaysia, although health issues, complicated travel and duration of detention can be major obstacles in rebuilding the industry.

RESEARCH METHOD

The relationship between regional economic activity and domestic tourism will be explained through the theory of externalities and agglomeration economies. This study estimates economic activity using the number of businesses as a proxy for domestic tourism. The number of companies is a measure of concentration and urbanization and is referred to as an urbanization and agglomeration economy (Woodward, Figueiredo, & Guimarães, 2006). Business agglomeration can also be identified as worker density. Firm density and worker density measure economic activity broadly because they include both forward and backward linkages. Thus, business density can be a better measure than population density in capturing human and economic activities and their interactions.

The source of data used in this study is Domestic Tourist Statistics for 2019-2020 through a Digital Domestic Tourist survey and based on Mobile Phone Data (MPD). This study used data on the number of trips made by domestic tourists by destination province, 2019-2020 (monthly data). Other data used is micro, small and medium enterprise data obtained from the 2019 manufacturing company industry survey. The dependent variable is the outcome of domestic tourism which is reflected by the number of trips made by domestic tourists by destination province (trip). The main independent variable is the number of companies (establishment).
The estimation strategy that will be carried out in this study includes Moran's I measurement as a preliminary analysis to prove the existence of spatial autocorrelation in the estimated

variables, preparation of a spatial weighing matrix, and specification of the model used for estimation. The main software used in this research is STATA. STATA is used for data management, forming a research database, creating descriptive tables, and processing the Durbin spatial regression model.

Before carrying out spatial modeling, spatial autocorrelation is carried out which is used as an initial aid for the existence of spatial effects between regions (provinces) on each variable. Spatial dependency or autocorrelation between locations is tested using Moran's I test with the following hypothesis.

- H_0: I = 0 (There is no interdependence between regions)
- H_1: I ≠ 0 (There is interdependence between regions)

Moran's index of a variable is expressed as follows:

$$\boldsymbol{I} = \frac{\boldsymbol{N}\sum_{\boldsymbol{i}=\boldsymbol{1}}^{\boldsymbol{N}}\sum_{\boldsymbol{j}=\boldsymbol{1}}^{\boldsymbol{N}}\boldsymbol{W_{ij}}(\boldsymbol{Y_i}-\bar{\boldsymbol{Y}})(\boldsymbol{Y_j}-\bar{\boldsymbol{Y}})}{\sum_{\boldsymbol{i}=\boldsymbol{1}}^{\boldsymbol{N}}\sum_{\boldsymbol{j}=\boldsymbol{1}}^{\boldsymbol{N}}\boldsymbol{W_{ij}}\sum_{\boldsymbol{i}=\boldsymbol{1}}^{\boldsymbol{N}}(\boldsymbol{Y_i}-\bar{\boldsymbol{Y}})^{\boldsymbol{2}}} \quad \ldots(1)$$

Where *I* is Moran's Index, *N* is the number of observed spatial units (number of regions), *W* is the spatial weighting matrix, *i* is the i-th row and *j* is the j-column, *Y* is the variable value and $\bar{Y}$ is the average value the average of the observed variables.

The spatial method in this study will use the Durbin spatial regression model (Spatial Durbin Model/SDM). Compared to other research methods, SDM is very popular in measuring spatial spillover effects because it does not only consider the spatial correlation of the (independent) explanatory variables, but also the dependent variable. This model is characterized by the addition of spatial lag in the dependent variable (ρWY) and spatial cross in the independent variable (θWX). The three components of HR are the lag of the dependent variable, a set of independent variables from spatial units, and a set of spatial independent variable lag (LeSage & Pace, 2009). The SDM model is used to estimate the spatial linkages of tourism in an area with the surrounding areas. This model was chosen to see the effects of endogenous and exogenous interactions. In general, Spatial Durbin Model as follows:

$$Y = \alpha + \rho WY + +\beta X + \theta WX + \varepsilon \quad \ldots(2)$$
$$\varepsilon \sim N(0, \sigma^2 \boldsymbol{I_n})$$

Furthermore, the research problem will be answered by using a model specification which is an adoption and modification of the model developed by Falk et al. (2021). In his research on how regional economic activity affects domestic tourism during Covid-19 in 2020, economic activity is measured as business agglomeration and tourism demand is estimated by the number of stays. The research model of Falk et al. (2021) also considers the existence of a second home and regional characteristics such as coasts, national parks. Unlike the research by Falk et al. (2021), this study estimates domestic tourism as a proxy for the number of visits (trips) by domestic tourists to destinations, with the following model specifications.

$$\begin{aligned}\Delta \ln TRIP_{it} = {} & \alpha_0 + \alpha_1 lnestablishment_{it} + \alpha_2 labor_{it} + \alpha_3 density_{it} + \alpha_4 Pantai_{it} + \\ & \alpha_5 nationalpark_{it} + \alpha_6 W_1.lnestablishment_{it} + \alpha_7 W_1.labor_{it} + \\ & \alpha_8 W_1.density_{it} + \alpha_9 W_1.coastal_{it} + \alpha_{10} W_1.nationalpark_{it} + u \\ & \ldots(3)\end{aligned}$$

$$u = \alpha_u W_2 . u + \varepsilon$$

where *lnTRIP* shows the number of domestic visits, *lnestablishment* shows the number of businesses, *labor* shows the number of workers in the business, *density* shows population density. The *coastal* variable indicates the length of the coastline and the *National Park* is a dummy variable if (1) the area has a beach or (0) if the area does not have a beach. W_1 describes a normalized spatial continuity weighting matrix with the highest eigenvalue of 1. Parameters α_1 to α_5 measure the direct effect of regional characteristics, while α_6 to α_{10} measure the spillover effect.

RESULTS

Table 1. The Observation Unit Information

Variable	Mean	Std. Dev	Min	Max
(1)	(2)	(3)	(4)	(5)
Dependent				
Trip	1.520.524	2.766.321	7.986,93	17.758.640
Independent				
Establishment	126.891	215.955,4	4.583	915.349
Control Variable				
Labor	306.308	573.636,9	10516	2597838
Density	739,04	2.663,56	9	15907
Coastal	2.337,16	2.553,94	10,66	11243,59
National Park (dummy)	0,882	0,323	0	1

The unit of analysis in this study is all provinces in Indonesia in 2019-2020 (monthly data period). Table 1 contains the descriptive information about the observation unit. Domestic tourism as reflected by the number of visits made by foreign tourists by destination province in Indonesia ranges from 7 thousand to 17 million visits. West Java Province with the highest Trip value of 17,758,640 visits in June 2019. Maluku Province (with the lower trip value of 7,986.93 visits in May 2020.

At the end of 2019, Indonesian tourism is increasingly victorious so that this industry really supports the leisure economy. Conditions are different in 2020, although domestic tourism is still concentrated on the island of Java (Figure 4.2), the number of trips by domestic tourists has statistically decreased drastically by around 75 to 80 percent compared to the previous year. This is due to the threat of COVID-19 which is forcing people to reduce their mobility, including taking tourist trips. Large-scale social restriction policies and bans on going home for holidays are also the cause of the low number of foreign tourist visits in 2020.

Furthermore, the population density variable is used as a control variable that affects the number of domestic visits (trips). The population density variable represents the economics of urbanization. Economic urbanization occurs due to changes in population/density in an area. Based on the estimation results, the rho value is significantly positive, meaning that an increase in visits (trips) by domestic tourists to neighboring provinces will increase visits

(trips) by domestic tourists in that province. This is in line with the results of Moran's I test which has a significant positive value where visits (trips) by domestic tourists to a province will encourage visits (trips) by domestic tourists to provinces adjacent to that province.

The estimation results for 2019 show that the establishments variable is significant and negative for the number of domestic visits. The number of establishments is an indicator of economic activity in the region, the more establishments, the higher the economic activity. A collection of establishments or industries that are concentrated in an area will have an impact on the use of space to become an industrial area, so that the area is not suitable to be used as a tourist area, especially natural and cultural tourism.

DISCUSSION

This study aims to analyze the effect of regional economic activity on domestic tourism during the pandemic in Indonesia using spatial data analysis techniques. For establishment and density variables, the spatial lag is negative and significant. These results indicate that the increase in establishment and population density in neighboring provinces can result in a decrease in the number of visits by domestic tourists in the province. Establishment density which is negative is in line with the study of Falk et al. (2021), that areas with high regional economic activity are less attractive to domestic tourists. A collection of establishment or industries that are concentrated in an area will have an impact on the use of space to become an industrial area, so that the area is not suitable to be used as a tourist area, especially natural and cultural tourism. In particular, the development of areas with main economic activities such as industry, tourism, logistics, technology and other economies, in accordance with government policies in encouraging regional economic growth.

The labor variable where the spatial lag is positively significant. This means that an increase in the number of workers in neighboring provinces will support an increase in visits by domestic tourists to the province. This positive relationship indicates an agglomeration effect because the spatial concentration of industrial sector activities will attract other economic activities. These results indicate that labor is one of the important factors that can increase tourist attractiveness in a province. Labor productivity reflects the performance of the workforce so that a fairly high increase in skills and performance will be a distinct advantage in tourism services. So that an increase in the number of workers will increase domestic visits in a province.

The significant spatial lag coefficient (rho) in the SDM model proves that units in the form of regions, in this case provinces in Indonesia, are related to one another. A positive coefficient value indicates that a province with a high number of foreign tourist visits is adjacent to a province with a high number of foreign tourist visits. This can be due to the close distance and accessibility between provinces which make it easier for foreign tourists to visit and travel multi-destination.

In the SDM model there is a spatial lag of statistically significant independent variables, namely establishment, labor, and density. For establishment and density variables, the spatial lag is negative and significant. This shows that the increase in business and population density in neighboring provinces can result in a decrease in the number of domestic tourists visiting the province. According to (Yang & Fik, 2014), this negative association implies competition or competition between provinces regarding tourism growth. In this case, inter-provincial competition can be caused by the different spatial planning and

regional development of each province. Regional development can be allocated for industry, tourism, logistics and so on, in accordance with government policies in encouraging regional economic growth.

The spatial autocorrelation parameter in the SDM model (rho) is 0.8617 which is statistically significant at the 1 percent level. These results indicate that a 1 percent increase in domestic tourist visits to certain provinces will contribute to an increase of 0.8617 percent of domestic tourist visits to neighboring provinces. This finding highlights the spillover effect on visits by domestic tourists to provinces in Indonesia. This is in accordance with Tobler's first law of geography which states that all entities are related to one another.

CONCLUSION

This study found the influence of regional economic activity, both from within the province and between provinces. The spatial pattern of domestic tourism in Indonesia in 2019-2020 is clustered or forms agglomerations. Provinces that have higher visits by domestic tourists are surrounded by neighboring provinces with high levels of visits by domestic tourists as well. On the other hand, a province that has a low level of foreign tourist visits is surrounded by neighboring provinces with a low level of foreign tourist visits as well.

The results showed that areas with high regional economic activity were less attractive to domestic tourists during the Covid-19 pandemic in Indonesia. The findings also confirm that other factors affecting domestic tourism are labor and population density. Meanwhile, regional characteristic factors such as beaches and national parks have no significant effect on domestic tourism. Meanwhile, regional characteristic factors such as beaches and national parks have no significant effect on domestic tourism. In addition, the estimated results show that domestic sports in a province are not only influenced by the characteristics of the province itself such as business and labor agglomeration and natural characteristics such as beaches and national parks, but also related to similar characteristics from neighboring provinces.

LIMITATION

The limitations of this study include the use of provincial-level data for monthly periods in estimating. Ideally, the analysis of regional economic activity on domestic tourism is more accurate and specific if it is carried out at the district/city level because the scope of the analysis is smaller. In addition, this study focuses on short-term effects during the pandemic because it only uses data from 2019 to 2020. Therefore, future research might consider using the smallest level of data and a fairly long period of time.

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DECLARATION OF CONFLICTING INTERESTS
The authors declare no potential conflict of interest.

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