A SPATIAL ECONOMETRIC APPROACH: TOURISM SPILLOVER EFFECT IN INDONESIA

A Research Paper presented by:

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(Indonesia)

in partial fulfillment of the requirements for obtaining the degree of
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

Economics of Development (ECD)

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December 2019

Disclaimer:

This document represents part of the author's study program while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

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Dedication

For my parents

For my lovely wife, Oktarianti

For my precious boys, Arleydhia Rajendra Farzana and Arleybarra Danendra Erasmahira

For my country, Indonesia

Acknowledgement

The first place praise goes to Allah SWT, the All-Powerful, who gives me this wonderful chance to learn and improve my knowledge.

I would like to express my sincere gratitude to Dr. Robert Sparrow as my supervisor for his guidance, advice, and comments during the research process. My highest appreciation goes to Dr. Lorenzo Pellegrini as my reader for his constructive discussion and feedback.

I am very grateful to my parents and my beloved family, especially my lovely wife Oktarianti and my two little heroes, Dhia and Barra. Your prayers are my blessings, your smile is my motivation.

I would also like to appreciate Bank Indonesia for providing the opportunity to improve my competencies.

Finally, my gratitude is dedicated to all lecturers, staffs, classmates, and friends at the Institute of Social Studies (ISS) for all the assistance and cooperation.

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Abstract

This study examines the effect of government policies on optimizing the tourism sector to boost the economy and overcome the unemployment problem in 33 provinces in Indonesia. Data exploration in this study uses the econometric spatial approach with an observation period in 2010-2017. Government spending in the tourism sector is a proxy for government support. Meanwhile, working capital loans reflect the response of the private sector to the potential of the tourism sector.

The estimation results show a dispersed pattern on the tourism output, while the workforce experiences the phenomenon of agglomeration. The Spatial Durbin Model exposes that government spending in the tourism sector does not have a significant effect on increasing output and employment. Meanwhile, the realization of working capital loans only has a significant effect on employment in the tourism sector. The number of foreign tourists does not have a significant spatial effect on tourism performance. The result is suggesting that top-down tourism optimization policies in Indonesia need to be re-evaluated.

Relevance to Development Studies

The socio-economic disparity between regions is a problem that is still faced by many developing countries, including Indonesia. Various efforts and policies have been made to overcome this disparity problem. However, the diversity of socioeconomic and geographical conditions in Indonesia made policy implementation less than optimal. The assessment in this study provides specific empirical information on the effects of tourism sector optimization policies at a provincial level in Indonesia. Hence, this study will have a contribution to the development process and equitable socio-economic well-being in Indonesia.

Keywords

tourism, spillover effect, spatial econometric, economy, Indonesia

Chapter 1 Introduction

1.1. Background of the Study

In the past eight years, the Indonesian government has placed the tourism sector as a leading sector. One of the main reasons that make tourism a leading sector in Indonesia is to optimize local economic potential as an effort to reduce poverty and unemployment (*Kantor Staf Presiden*. 2018). To support this policy, the realization of government spending in the tourism sector tends to increase, as well as the distribution of working capital loans as a form of support and response from the private sector to tourism potential. However, tourism optimization policies have not shown equitable effects in all regions in Indonesia.

Knowing that unemployment and poverty are fundamental problems that are still faced by all regions in Indonesia, the Indonesian government made various efforts to overcome these problems. Moreover, according to Todaro and Smith (2015: 118), the success of economic development is not only reflected in high economic growth, but there is also another essential factor that improves the standard of living of the community, that can be achieved through job creation.

Looking at the various potentials that Indonesia has, the government views that the tourism sector is a sector that has the potential to be developed to drive the economy. According to Sinclair (1998: 38), tourism is one of the potential sectors for developing countries to increase per capita income, foreign exchange, government revenue, and absorb labor. Moreover, Fahmi et al. (2016: 74) emphasized that tourism has a positive relation to traditional cultural and creative industries. Seeing the positive impact of the tourism sector, the government made various efforts to optimize the tourism sector, which is reflected in the allocation of government spending, both central and regional (figure 1.1).

In terms of central government spending, there was a fluctuation in central government spending in the tourism sector during the period 2010 to 2017. In 2014, central government spending was at the lowest level in the last eight years, reaching IDR1,469 billion. Based on the information from the Directorate General of the Budget of the Ministry of Finance (2016: 13), the decrease in the allocation of promotional and marketing expenditure was one of the causes of the decline in central government spending in the tourism sector in 2014. During that period, organizational restructuring also affected the Ministry of Tourism budget allocation. Central government spending rebounded since 2015, which was mainly driven by the launching of the tourism sector

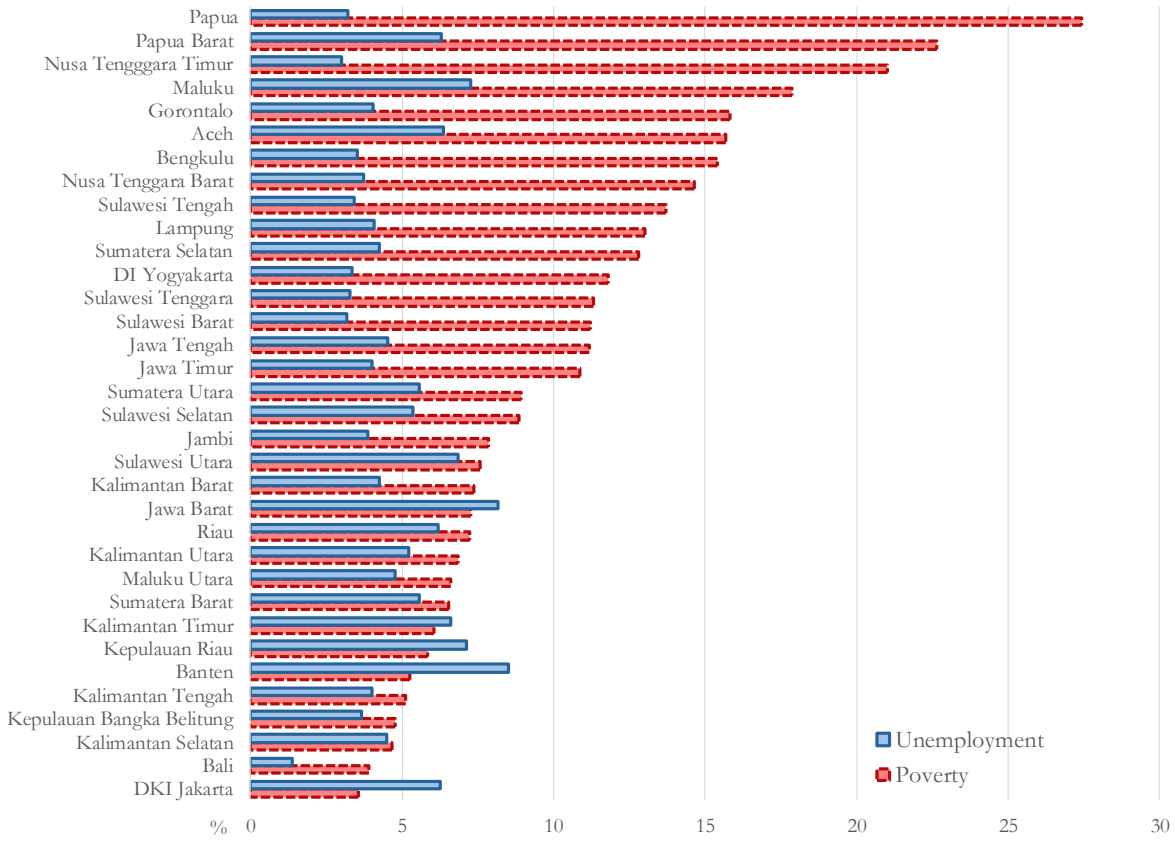
as a national priority sector. Meanwhile, in terms of regional government expenditure, the trend of expenditure allocation in the tourism sector tends to be positive.

Figure 1.1. Government Spending on Tourism

Source: Ministry of Finance (2019) and DJPK (2019) processed by the author

On the other hand, the official release of *Badan Pusat Statistik* (BPS, the Central Bureau of Statistics) shows that in 2018, the majority of provinces in Indonesia still have a poverty rate of more than 10%, even in remote areas, such as Papua, the number of poor people reaches 25% of the total population. In addition, there is a disparity in employment between provinces, which is reflected in variations in the unemployment rate between provinces, where the unemployment rate in 14 provinces reached more than 5% (figure 1.2).

Figure 1.2. Poverty and Unemployment Rate in 2018 (Percent)



Source: BPS (2019a, 2019c) processed by the author

Another problem that still occurs in Indonesia is the high economic gap between regions. Until now, Indonesia's economy remains concentrated in the Java region. Table 1.1 shows that the share of the economy in Java reaches almost 60% of the total economy of Indonesia, causing high socio-economic inequality between regions in Indonesia.

Inequality of infrastructure and the ability to manage tourism potential creates agglomeration in the tourism industry. Rosenthal and Strange (2003: 388) stated that economic agglomeration occurs because there is a particular concentration of industry spatially. Myrdal(1970), as cited in Meardon (2001: 46), states that economic agglomeration can have a positive spillover effect on the surrounding area or even make inequality between regions higher. Given the initiation of tourism development policies originating from the central government (top-down), the estimated influence of policies on the regional economy is necessary whether these policies can overcome the problems of poverty, unemployment, and inequality in each region in Indonesia.

Table 1.1. Distribution of Gross Domestic Products in 34 Provinces at Current Prices (Percent)

Province	2010	2011	2012	2013	2014	2015	2016	2017
Aceh	1.48	1.38	1.32	1.26	1.2	1.11	1.08	1.06
Sumatera Utara	4.82	4.82	4.81	4.89	4.89	4.91	4.96	4.95
Sumatera Barat	1.53	1.52	1.52	1.53	1.54	1.54	1.55	1.55
Riau	5.66	6.21	6.44	6.32	6.36	5.6	5.39	5.1
Jambi	1.32	1.32	1.33	1.35	1.36	1.33	1.36	1.38
Sumatera Selatan	2.83	2.9	2.92	2.92	2.87	2.85	2.8	2.78
Bengkulu	0.41	0.41	0.42	0.42	0.42	0.43	0.44	0.44
Lampung	2.19	2.17	2.16	2.13	2.16	2.17	2.21	2.23
Kep. Bangka Belitung	0.52	0.52	0.52	0.52	0.53	0.52	0.51	0.51
Kep. Riau	1.62	1.62	1.67	1.7	1.69	1.71	1.71	1.66
DKI Jakarta	15.66	15.64	15.79	16.1	16.5	17.07	17.19	17.43
Jawa Barat	13.21	13.06	13.01	13.11	12.97	13.09	13.06	12.92
Jawa Tengah	9.08	8.85	8.7	8.64	8.64	8.68	8.63	8.59
DI Yogyakarta	0.94	0.91	0.89	0.88	0.87	0.87	0.87	0.86
Jawa Timur	14.43	14.32	14.4	14.39	14.4	14.52	14.67	14.61
Banten	3.95	3.91	3.9	3.93	4.01	4.11	4.09	4.08
Bali	1.37	1.34	1.36	1.4	1.46	1.51	1.54	1.56
Nusa Tenggara Barat	1.02	0.87	0.8	0.77	0.76	0.91	0.92	0.9
Nusa Tenggara Timur	0.64	0.62	0.63	0.64	0.64	0.65	0.66	0.66
Kalimantan Barat	1.25	1.24	1.23	1.24	1.24	1.26	1.27	1.28
Kalimantan Tengah	0.82	0.84	0.85	0.85	0.84	0.86	0.89	0.91
Kalimantan Selatan	1.24	1.26	1.23	1.21	1.2	1.18	1.16	1.15
Kalimantan Timur	6.09	6.58	6.35	5.4	4.94	4.33	4.02	4.29
Kalimantan Utara	-	-	-	0.55	0.55	0.53	0.52	0.56
Sulawesi Utara	0.75	0.73	0.74	0.74	0.76	0.78	0.79	0.8
Sulawesi Tengah	0.75	0.78	0.8	0.83	0.84	0.92	0.95	0.97
Sulawesi Selatan	2.5	2.53	2.63	2.69	2.79	2.92	3.00	3.03
Sulawesi Tenggara	0.71	0.71	0.75	0.74	0.74	0.75	0.77	0.78
Gorontalo	0.23	0.22	0.23	0.23	0.24	0.24	0.25	0.25
Sulawesi Barat	0.25	0.26	0.26	0.26	0.28	0.28	0.28	0.29
Maluku	0.27	0.27	0.28	0.29	0.3	0.29	0.29	0.29
Maluku Utara	0.22	0.22	0.22	0.22	0.23	0.23	0.23	0.23
Papua Barat	0.6	0.57	0.55	0.55	0.54	0.54	0.53	0.52
Papua	1.61	1.38	1.3	1.28	1.25	1.29	1.39	1.39

Source: BPS (2019b)

1.2. Research Objectives and Question

The main objective of this study is to analyze the influence of government policies on driving the development of the tourism sector in all provinces in Indonesia. This study specifically identifies the effect of government spending, distribution of working capital loans, and other factors on the spread of the performance of the tourism sector, which is reflected in tourism output. This study also aims to see whether the development of the tourism sector can have a positive influence in

overcoming one of the fundamental socio-economic problems that are reflected in the spread of tourism employment provision in each province in Indonesia.

Based on the objective, there are two fundamental research questions in this study. First, "*how does public and private investment in the tourism sector affect the economy and employment at the provincial level in Indonesia?*" Second, "*to what extent is the spatial influence of the tourism sector in boosting the economy and increasing employment in Indonesia?*" This paper tries to address several derived questions to answer this question, namely:

1. What are the spatial patterns of tourism output and employment in Indonesia?
2. Does government spending in the tourism sector give a positive spatial impact on tourism output and absorption of tourism employment?
3. Does the distribution of working capital credit, as a business actor's response to tourism potential, have a positive spatial influence in increasing tourism output and absorbing labor?
4. Are there any other factors that spatially exert a significant spillover effect on the tourism sector?

1.3. Scope and Limitation of the Study

Sinclair and Stabler (1997: 4) stated that tourism is one of the unique sectors, where the influencing factors are not only derived from socio-economic factors, but also there are influences from various other factors such as politics, environment, and behavior. However, the study of tourism ideally also takes account of various factors (multisectoral), both interregional and globally. We recognize that the use of these factors makes tourism studies must provide increasingly complex information and analysis methodologies. On the other hand, information on regional tourism development in Indonesia is still limited. Considering the availability of such information, objectives, and research questions, this study focuses more on examining factors that are spatially thought to affect tourism performance.

Meanwhile, there are some limitations in this research, namely global external factors and some events that happen out of control, such as natural disasters and security disturbances. The limited information regarding the linkages of global dynamics at the regional level and the unavailability of security index data series over a long period are the reasons these two factors are not included in the empirical estimates in this study. Information from these two factors is used as descriptive explanatory information in strengthening the estimation and analysis results. Moreover, we also realize that the economy in most provinces is not based on tourism, so the paper uses specific

relevant data as a proxy variable to explain the performance and influence of the tourism sector at the provincial level.

Considering the incomplete and under-updated city data, so the scope of this research will be focused on the provincial level in Indonesia. Data analysis will cover 33 provinces out of a total of 34 provinces during the period 2010 to 2017. One province that is not included in the analysis is the new expensed province. The data is not yet available.

1.4. The structure of the Paper

The report will be compiled in six chapters to facilitate understanding of this research. The first chapter mainly explains the background of the study, the research objectives, the research questions, and completed with research scope and limitation. Chapter two contains definitions, underlying theories, and references to related studies that had been done before. Chapter three informs the recent tourism condition in Indonesia. The research methods, the variables, and the data used in this study will be explained in chapter four. Chapter five provides the results and discusses the analysis of the study, followed by the conclusions in the last chapter.

Chapter 2 Theoretical Framework and Literature Review

The main objective of this study, the theoretical basis, and the literature review used in this study are all focus on the spatial influence of tourism. To gain a comprehensive understanding, the flow in this chapter begins with literature that discusses and deals with economic growth theory. The literature on the polar theory of economic growth is also presented in the context of spatial analysis. Finally, some literature relating to tourism to the economy will be reviewed to answer the research objectives, including a summary of the results of previous related studies.

2.1. Economic Growth Pole Theory

Perroux (1950: 95) argued that economic growth does not occur everywhere and does not coincide. Economic growth occurs at specific points with the magnitude/intensity that tends to change. Some factors that make an area become a center of economic growth are ease of obtaining resources, support of transportation systems, adequate infrastructure, and high market potential.

Richardson (1976: 2) stated that an imbalance of social and economic conditions amongst regions would cause three patterns of relations amongst regions. First, the spread effect, which is a positive impact on the development of the economic center that benefits the surrounding area because it expands the distribution of resources in the surrounding area (positive externalities). Second, the backwash effect, which is a negative impact from the development of the economic center, that will harm the surrounding area because it will absorb resources in the surrounding area (negative externalities). Third, the net spillover effect is a condition that is expected from the development of the central region of the economy, which will initially absorb other regional resources, and have a positive influence on the surrounding area in the long run. Furthermore, Richardson (1976: 5) gives an illustration; the backwash effect phenomenon occurs when there is a movement of workers from rural areas to the economic center. As infrastructure develops, workers from the regions can utilize the transportation network to get to the work location. The development of the transportation network is a form of spread effect. When the number of labor migrants decreases while adding more supporting infrastructure, there will be a transition from negative to positive net spillover (spread effect > backwash effect).

The concentration of the economy forms two types of interaction patterns amongst regions, namely cluster and agglomeration. Belussi (2006: 78) explained that there are some differences between clusters and agglomeration. Agglomeration is the centralization of the location of similar businesses without interaction between business actors. Meanwhile, the cluster is an

interconnected business network system that forms a business chain from the supply of raw materials, production, to marketing. Parties involved in a cluster are relatively diverse, ranging from business actors, governments, and other institutions that interact with each other. Considering the availability of data and referring to research questions, this study only discusses the potential for the formation of agglomeration and its effects on the economy spatially. In addition, cluster terminology in this study is used to describe the condition of grouping regions, which are the mapping results of data processing.

The study of economic localization was also carried out by Frenken et al. (2005), which measures the effect of regional specialization and urbanization on productivity and employment in the regions in the Netherlands. An interesting finding in this study is that agglomeration does not encourage job creation. This finding was based on empirical results that the level of population density did not have a significant influence on labor growth.

The study of localization of the economy-related explicitly to tourism was conducted by Hosper (2003). The author conducted a study of tourism development policy on the island of Sardinia, Italy, by comparing the conditions of tourist visit data between top-down and bottom-up policies of localizing the tourism industry. The results of the study show that the development of top-down local tourism tends to fail. While local tourism development policies that are bottom-up, have a positive impact in the short term. The suggested solution involves all appropriate local actors actively in order to anticipate these two circumstances.

2.2. Tourism and Economic Growth

Leiper (1979: 396) explained that tourism is a system that involves travel and temporary housing, whose elements of the system consist of tourists, regions, routes, and the tourist industry. These elements will interact with each other in a broader environment that includes socioeconomic, including culture, technology, and politics. It was further expressed based on these definitions that there are three spatial aspects affecting tourism. First, the area of origin of tourists, which is the area where the departure starts and becomes the end of the journey (home). Second, the destination area, which is a place where tourists stay for a while. Third, the transit area, which connects the two previous, initial, and destination regions. Meanwhile, the Department of Economic and Social Affairs of the United Nations (2008: 1) also provides a nearly similar definition of tourism, namely traveling and living in an area outside the environment for not over a year in a row for vacation, business, and other purposes. Both definitions show that tourism has a much broader concept that includes activities related to social, cultural, and economical.

The relationship between tourism and the economy has been widely discussed and studied. The studies then explain the hypothesis of tourism's influence on economic growth (Tourism-Led Growth Hypothesis-TLGH). Balaguer and Cantavella-Jordà (2002: 879) used the export approach by involving the interaction among inventory, productivity, savings, investment, and measuring the contribution of the determinants of growth rates. The results of research conducted indicate that tourism has an influence on the economy in Spain in the long run, reflected in the results of cointegration and causality testing.

In more depth, Tang (2014: 20) explained the relationship between tourism and economic growth with the main focus of the study is to identify the allocation of potential resources in the tourism sector. The author separates commodities into two groups, namely tourism commodities and non-tourism commodities. The economic output (Y) is the sum of the tourism sector output (T) and the nontourism sector output (N). The tourism sector is assumed to depend on labor and capital stock and also provides spillover to the nontourism sector. Based on these assumptions, the functions of the two sectors can be written as follows:

$$T = G(L_T, K_T) \qquad \text{... (1)}$$

$$N = F(L_N, K_N, T) \qquad \text{... (2)}$$

Where T and N are respectively, the output of the tourism and nontourism sectors. While labor and capital stock, each is denoted by L and K. According to Feder (1983: 60), the assumptions in this method are recognized to be less robust, given the potential for mutually influential relations between the two commodity groups. However, he argues that the empirical results obtained are still relatively valid because the growth rate of a sector is one of the closest proxies to changes in the volume of commodities in the analyzed sector.

Brida and Pulina (2010: 2) stated that TLGH is a derivative of the export-led growth hypothesis, where an increase in economic growth can also be done by expanding exports, which will then encourage investment. Regarding tourism, exports come from the demand of foreign tourists that will affect the economy in the long term through various transmission mechanisms. First, tourism may increase foreign exchange, especially in the island nation, along with the high share of tourism in total exports recorded in the country's balance of payments. Second, tourism generates investment in both infrastructure and human resources. Third, tourism has a positive influence on the development of supporting industries, both directly and indirectly. Fourth, tourism promotes job creation and increases income. Both of these are multiplier effects obtained when there is involvement of local businesses in the development of the tourism industry. Fifth, tourism can encourage broad and overall economic improvement. In line with this explanation, Sinclair (1998:

2) stated that tourism is a sector that is quite promising for developing countries, given that this sector is claimed to be able to increase income per capita, generates foreign exchange, raise government revenue, and to absorb labor. Belloumi (2010: 1) said that international tourism is an essential factor for economic growth. He argues that an increase in the number of foreign tourists would drive foreign exchange earnings and provides job opportunities along with rapid investment as tourism activities grow.

Tang (2014: 30) stated that in general, there are four hypotheses of the relationship between tourism and economic growth, namely: (1) Growth hypothesis, which is often also called TLGH. The hypothesis states that tourism expansion affects economic growth; (2) Contraction hypothesis, where the tourism development does not have a significant effect in boosting economic growth; (3) Feedback hypothesis, where the causal relationship between economic growth and tourism expansion is two-way and influences each other; and (4) Neutrality hypothesis that states no relationship between tourism and economic growth. All policies related to tourism will not affect economic growth.

In contrast, Sharpley (2000: 14) argued that economic development could not be directly implemented in tourism development because the development of tourism centered on increasing production and consumption. On the other hand, sustainable economic development not only looks at economic improvement but also considers the sustainability of ecosystems and the environment, which in the long run, is often at odds with the progress of tourism development itself.

2.3. Summary of the Previous Study

Previous studies have tried to elaborate the spatial influence of tourism on the economy. In general, the results revealed six factors that might be affecting tourism, namely infrastructure, tourist attractions, disaster, ease of access, distance, and population density.

Using the spatial autoregressive models approach, a study by Marrocu and Paci (2013) found that the number of hotels is a proxy for tourism infrastructure that has a significant positive effect on the economy in 107 provinces in Italy. Yang and Fik (2014), in their research using the Spatial Durbin Model (SDM) method, found a significant positive relationship between infrastructure and tourism performance in 342 cities in China. Furthermore, the condition of infrastructure makes the regions more accessible to create a higher level of regional openness and a positive impact on driving tourism performance (Yang and Wong 2012).

While on the other hand, distance and density of the population generate an adverse impact on tourism, partly due to the influence of competition, which can generate a negative impact on tourism performance (Marrocu and Paci 2013, Yang and Fik 2014).

Using a descriptive event analysis approach, Rindrasih et al. (2019) tried to explore the effects of disasters on tourism in Indonesia. The author compares the data on the number of international tourists in five regions, namely Bali, Yogyakarta, Medan, Batam, and Jakarta, when a major disaster occurred in Indonesia. The results showed that the disaster made tourists divert their travel routes to other areas, so it was assumed that there was a spillover due to the disaster event.

The exploration results of the relationship between tourism performance and the economy in several other studies show that tourism development can bring different spatial impacts. The development of tourism in several European countries, such as Spain, Greece, Italy, and Portugal, has a positive impact on welfare and improves the quality of people's lives (Proença and Soukiazis 2008, Urtasun and Gutiérrez 2006). A recent study by Vieira (2017) in 278 municipalities of Portugal specifically showed that tourism is a pillar of the economy in coastal areas. Indications of collaboration amongst regions as a form of positive spatial spillover were captured in Romão and Nijkamp's research (2018). On the other hand, research by Urtasun and Gutierrez (2006) found that tourism development generated a negative impact on the environment in 50 provinces in Spain.

Until now, there is limited study related to tourism using a spatial approach for all provinces in Indonesia so that this paper can become one of the pioneers in the spatial study of tourism and economy for the scope of provinces in Indonesia. By seeing that Indonesia is an archipelagic country, this study also has different spatial processing from most previous spatial studies. In more detail, this study adds several variables that are specifically related to tourism performance in Indonesia, including flight routes, bus numbers, literacy levels, and consumption per capita.

To obtain more diverse information related to spatial tourism and economic studies, table 2.1 presents several studies on this matter.

Table 2.1 Summary of the Previous Study

Author	Method	Result and Conclusion
Urtasun and Gutierrez (2006)	OLS regression on the social welfare index in 50 provinces in Spain. The authors used the social welfare index as the dependent variable and the Gini index as the independent variable.	Tourism development had a positive influence on people's welfare. However, it impacted negatively on environmental quality.
Proença and Soukiazis (2008)	The authors regressed income per capita on population growth and international tourism revenues in panel data format for Greece, Italy, Portugal, and Spain.	Tourism had a significant effect on improving living standards and became a convergence factor.
Yang and Wong (2012)	The authors used the spatial econometrics approach in 341 cities in China. The regression process included the number of tourist arrival as the dependent variable. While the independent variables consisted of GDP, transportation infrastructure, foreign direct investment (FDI), attraction, and force major incident.	Factors such as infrastructure, tourist attractions, and SARS outbreaks significantly affected the flow of domestic tourism. Moreover, the level of openness was also an essential factor for tourism.
Marrocu and Paci (2013)	The authors examined a Spatial autoregressive (SAR) model in 107 provinces in Italia. The number of tourist arrival became the dependent variable. The independent variables in the model consisted of GDP, density, accessibility, natural elements, cultural and recreational attractions, coast, beach quality, distance, prices, and income.	Income, ease of access, and the number of attractions were decisive factors in driving tourism. While on the other hand, distance and density of the population generated an adverse effect on tourism.
Yang and Fik (2014)	The authors used the Spatial Durbin Model (SDM) across 342 cities in China from 2002 to 2010. The model	Economic growth is a significant factor affecting tourism. Moreover, there are

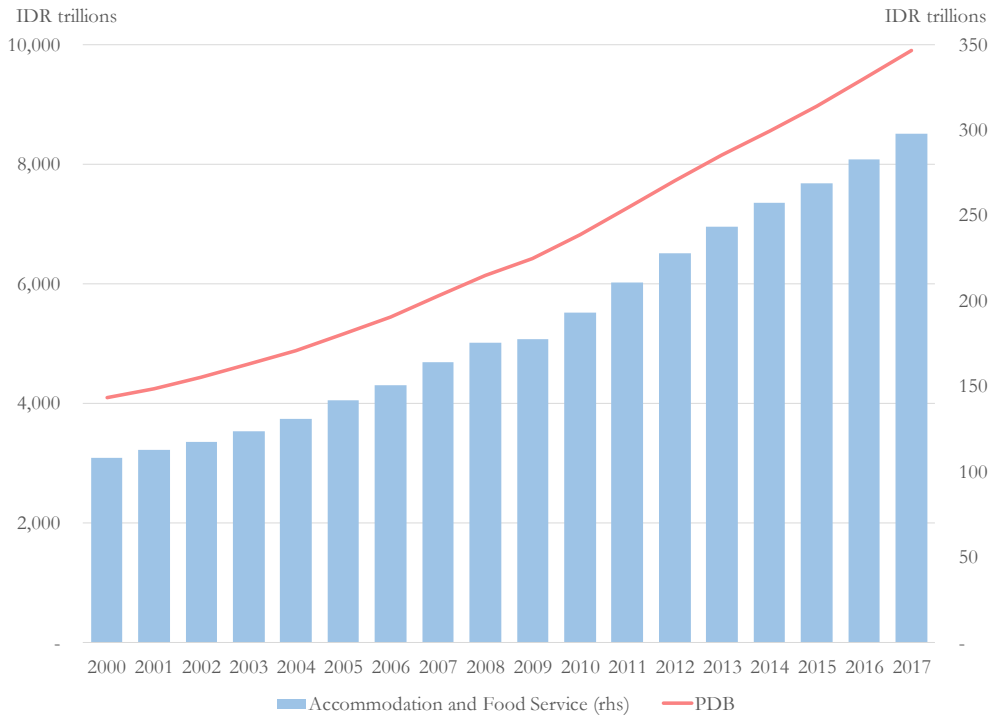
Author	Method	Result and Conclusion
	treated the regional tourism growth rate as the dependent variable. The author included some independent variables, such as total revenue of inbound and domestic tourism, the share of tertiary industry to GDP, density, a weighted index of the tourism resources, number hotel per capita, and GDP.	significant effects of spillover and competition between regions.
Vieira and Santos (2017)	The authors employed the spatial econometric approach in 278 municipalities of Portugal in 2012. The dependent variable was gross value added. The independent variables in the regression used investment, the proportion of employees education, research and development expenditure, and the proportion of sectoral employment	The estimation results show a significant effect of spillover amongst regions. In addition, tourism is also a pillar of the economy, especially in coastal areas.
Romão and Nijkamp (2018)	The authors used a spatial panel data model in 237 European *Nomenclature des Unités Territoriales Statistiques* (NUTS) from 2004-2011. The model used GDP per capita as the dependent variable. The independent variables were lag GDP per capita, tourist spending, the share of tourism in economy, research and development expenditure, employee education, the territory in Natura 2000, and sites classified by UNESCO.	There was a positive spillover effect from tourism on the economy. Moreover, the study found indications of cooperation among regions aimed at optimizing the potential of tourism to support regional economic development and minimize the negative influence of economic dynamics.
Rindrasih et al. (2019)	The authors used descriptive event analysis based on the location of the	The study found that the occurrence of natural disasters

Author	Method	Result and Conclusion
	disaster. The data used were hotel occupancy rates, the number of international tourists, and the GDP of the hotel and restaurant sector	and terrorism influenced the performance of tourism in Indonesia. The effect of spillover caused by disasters reflected from the changes in hotel occupancy rates and the number of tourist arrivals.

Chapter 3 The Overview of Tourism in Indonesia

In the last 17 years, the development of tourism in Indonesia, which is reflected in the performance of the accommodation sector and the provision of food and beverage, shows positive progress. This condition is inseparable from the general well-maintained economic conditions. Even so, the share of the accommodation sector in the Indonesian economy is still relatively small. Based on figure 3.1, the value of national GDP in 2000 was IDR 4,100.5 trillion and continued to increase to IDR 9,912.7 trillion in 2017. In line with GDP growth, the performance of the accommodation sector also tends to increase. In 2010, the accommodation sector value was recorded at IDR 108.28 trillion and reached IDR 298.08 trillion in 2017. Based on these figures, the average share of the accommodation sector in the economy during the period 2000 to 2017 was only around 3%.

Figure 3.1 GDP and National Accommodation Sector in Indonesia from 2000 to 2017 Based on 2010 Constant Prices

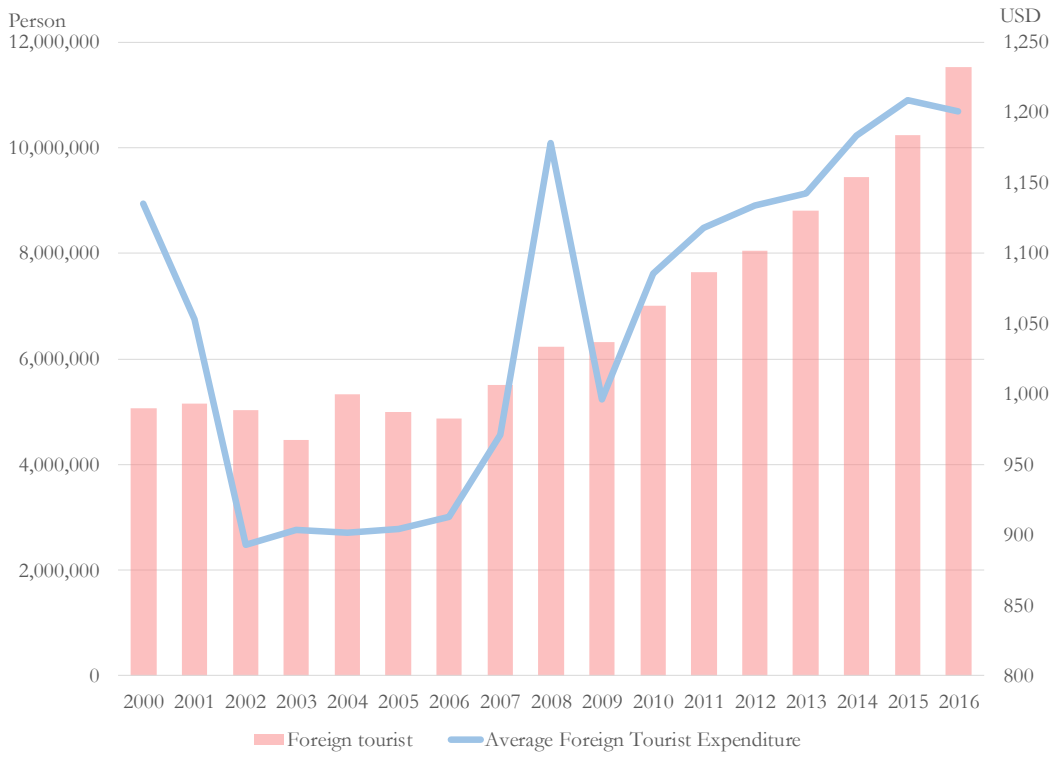


source: Bank Indonesia (2019a) processed by the author

The improvement of several tourism indicators strengthened the positive performance of the national tourism sector during the observation period. In terms of the number of tourists, there were 5.06 million foreign tourists visiting Indonesia in 2000 and a significant increase of 11.5 million in 2016. While the average foreign tourist expenditure experienced some fluctuations. In 2000, the average expenditure of foreign tourists reached USD1,135.18, then dropped significantly to USD893.26 in 2002, one of which was caused by the Bali Bombing incident. This figure then

increased to a peak in 2008 with an average expenditure of USD1,178.54. The surge in tourist spending in the 2008 period was partly due to an adjustment in hotel rates in line with rising fuel and electricity prices. Moreover, according to BPS report (2009), accommodation was the largest component in tourist expenditure in 2008, with a share of 36.46%. The global economic crisis in 2009 brought the average tourist expenditure back down to USD 995.93. After the global economic crisis, the average tourist spending rebounded to reach USD1,201.04 in 2016 (figure 3.2.).

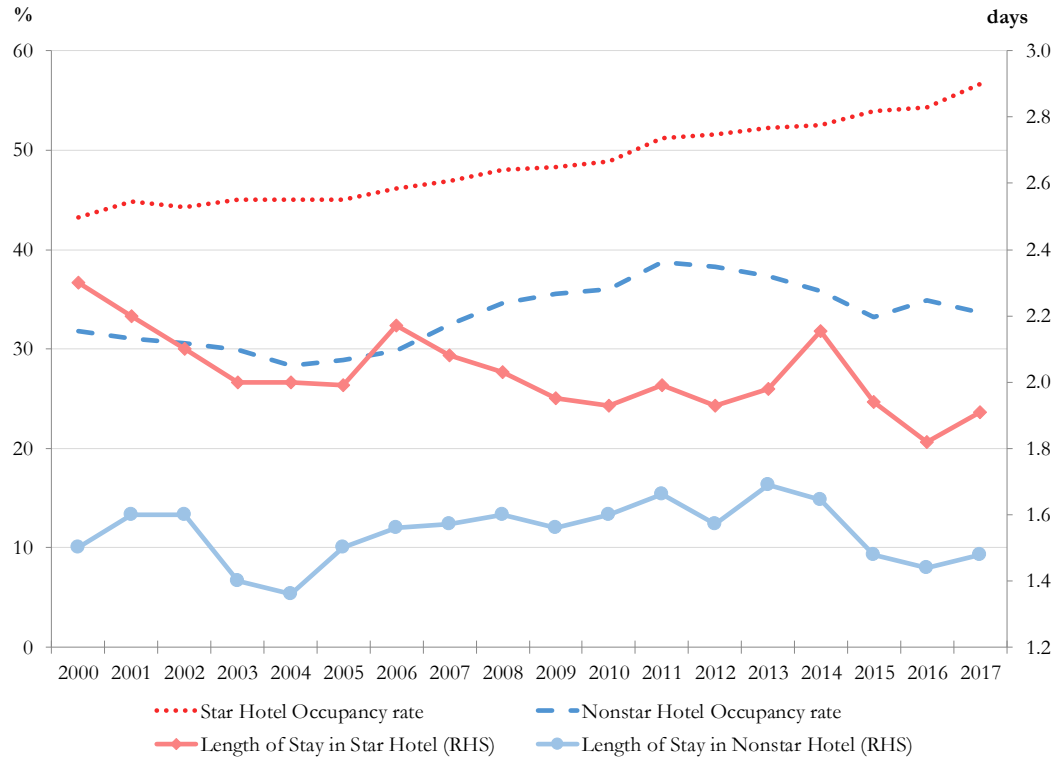
Figure 3.2 The Number of Visits and The Average Expenditure of Foreign Tourists in Indonesia from 2000 to 2016



source: BPS (2018c, 2018e) processed by the author

The increase in the number of tourists was one indication that the demand for accommodation was relatively maintained and underpinned national hotel performance from 2000 to 2017. The occupancy rate of star-rated hotels increased from 43.2% in 2000 to 56.69% in 2017, with the length of stay rate ranged in two days. Meanwhile, the occupancy rate of nonstar hotels was stable at 30%, with the length of stay approximately one day. This condition indicates that star hotels became tourists' preferences during their stay in Indonesia.

Figure 3.3 Hotel Occupancy Rate and Length of Stay in Indonesia from 2000 to 2017

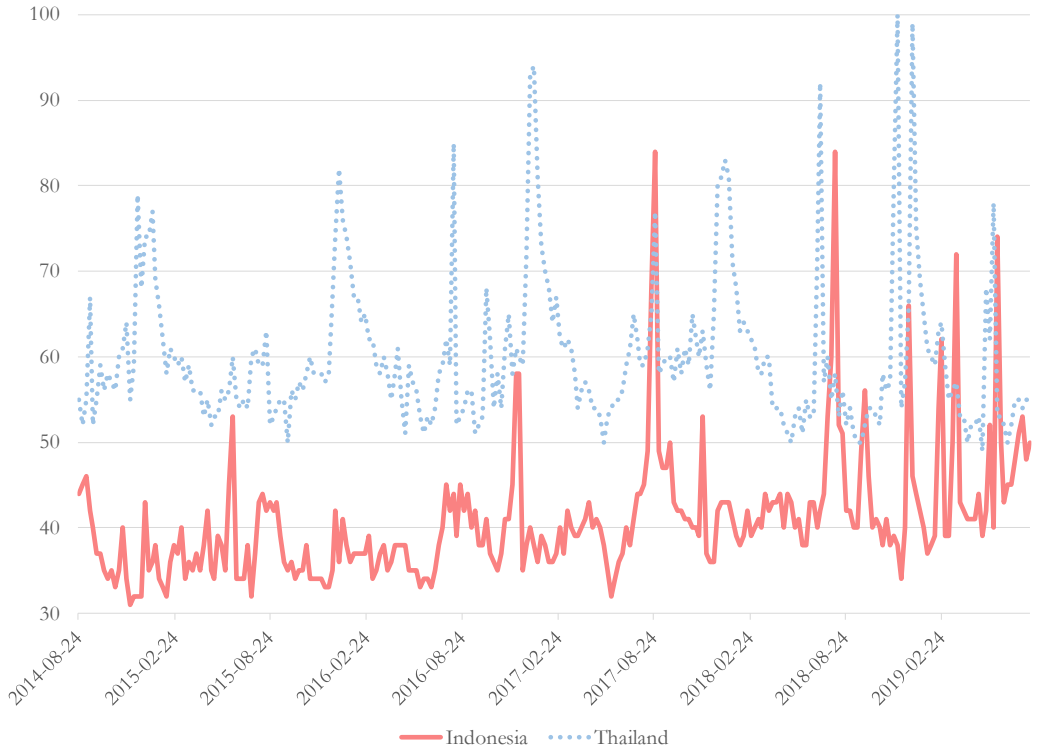


source: BPS (2018a, 2018b, 2018d) processed by the author

Another indication of the high potential for tourism demand was the use of search engines for tourist destinations in Indonesia. Based on Google Trends data, the search for information on tourist destinations in Indonesia by internet users globally was relatively stable. In the last five years, the average access of Google for keywords for tourist destinations in Indonesia reached 40.88[1] users every week. While the average access of Google to Thailand's tourist destinations reached 59.98 users every week (figure 3.4.). Referring to the country brand ranking in 2019, Thailand is one of the countries with the best ranking in the Asia region related to tourism branding, while Indonesia is ranked 10 (Bloom Consulting 2019). Nevertheless, trends in access to information on Indonesian tourism indicate that tourism potential in Indonesia is relatively recognized globally. Based on the 2017 Travel and Tourism Competitiveness Report, the main factor that attracted tourists was the relatively affordable tourism costs (World Economic Forum. 2017).

[1] Google provides a score range from 0 to 100. A value of 100 shows the maximum of weekly popularity keywords. A value of 50 means that the keywords is half as popular. A score of 0 means the insufficient of the data.

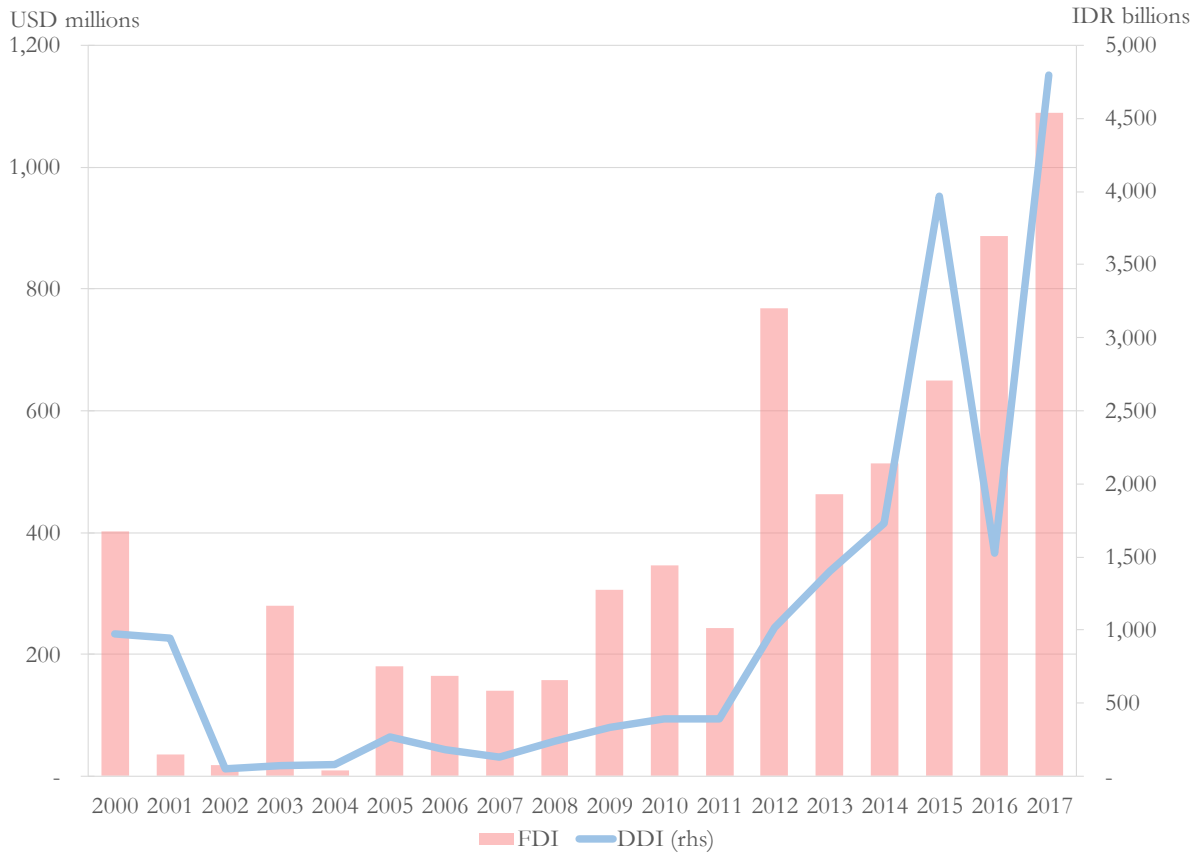
Figure 3.4 Weekly Google Trends in Tourism in Indonesia and Thailand from 2014 to 2019



Source: Google (accessed 25-8-2019) processed by the author

A positive tourism potential with increasing global demand makes the flow of investment in the tourism sector grow positively (figure 3.5). Foreign Direct Investment (FDI) in the tourism sector happened consistently since 2013. In 2017, FDI reached USD1,089.6 billion, the highest in the last 17 years. Meanwhile, the realization of Domestic Direct Investment (DDI) showed an upward trend since 2011 and experienced a significant decline in 2016. Changes in investment policy in the tourism sector caused DDI realization declined but increased FDI. In 2016, the government relaxed the policy for foreign business ownership in the tourism sector. The ownership of restaurants, bars, cafes, and sports centers fully opened for foreign investors. Furthermore, a maximum of 70% of foreign investment applied in the catering business, golf course, and also meetings, incentives, conferences, and exhibitions (MICE) services. There were also 14 business fields opened for foreign investors with a maximum investment share of 67%, included travel agents, one star hotels, two stars hotels, and unranked (nonstar) hotels (*Badan Koordinasi Penanaman Modal* (BKPM) 2016).

Figure 3.5 Tourism Foreign Direct Investment and Domestic Direct Investment in Indonesia from 2000 to 2017

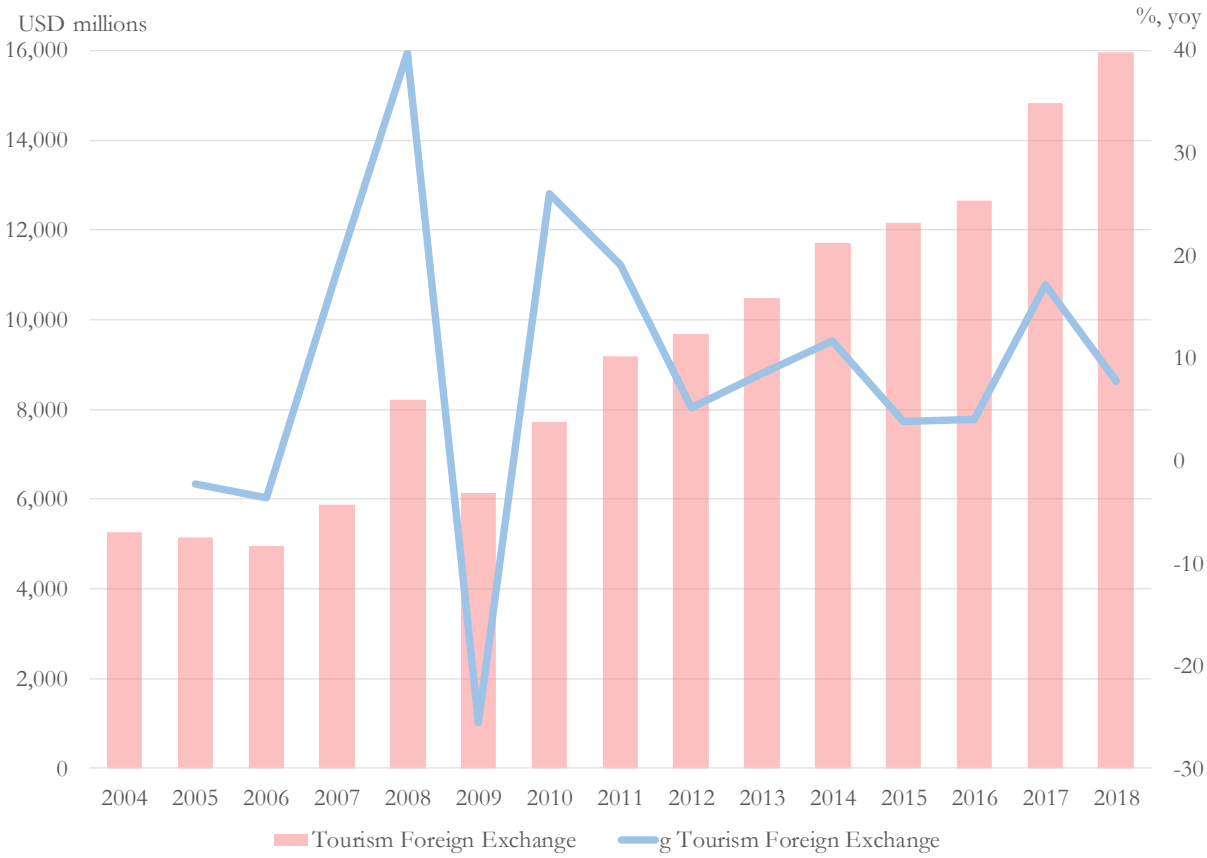


source: BKPM (2019) processed by the author

National tourism performance has a positive influence on Indonesia's balance of payments, mainly related to exports of travel services and passenger transportation. Figure 3.6 shows the performance of tourism in foreign exchange. The annual increase in tourism foreign reached 39.8% (year on year, YoY) in 2008. The high growth of tourism foreign exchange in this period was in line with the increase in the average expenditure of foreign tourists, as described previously in graph 3.2. In 2009, the tourism foreign exchange experienced a significant contraction reached -25.5% (YoY) because of the global financial crisis. A significant fluctuation in tourism foreign exchange growth occurred in 2012, where the growth rate was around 5% (YoY), lower than the 2011 growth of 19% (YoY). The results of the passenger exit survey conducted by the Ministry of Tourism (2012: 3) confirmed the low growth of tourism foreign exchange in 2012. The average foreign tourist spending in 2012 only grew by 1.39% (YoY), while the contraction of the length of stay of foreign tourists was relatively deeper, reached -1.77% (YoY). In 2018, Indonesia's tourism foreign exchange revenue attained USD15,967 billion. Although Indonesia's tourism foreign exchange experienced positive growth, it still lower than other countries in the Southeast Asian region. Thailand was a country in the Southeast Asian region with the highest foreign exchange

tourism revenue in 2017, reached USD57,477 billion, which was then followed by Singapore and Malaysia, with tourism foreign exchange revenues respectively reached USD19,707 billion and USD18,323 billion (United Nation World Tourism Organization (UNWTO) 2018).

Figure 3.6 Tourism Foreign Exchange in Indonesia from 2004 to 2018



Source: Bank Indonesia (2019b) processed by the author

Chapter 4 Data and Methodology

4.1. Data

This study uses secondary annual data that were officially published by various institutions from 2010 to 2017 in 33 provinces from 34 provinces in Indonesia. The study considers data availability that meets the statistical processing rules and explains the phenomenon being studied. LeSage and Fischer (2008) state that the use of annual data in a spatial model can overcome endogeneity problems that may arise from violations of simultaneous assumptions. Gallo and Fingleton (2014 pp.303) provide an explanation that reinforces these assumptions, where one of the causes of endogeneity problems is omitted variables. It was further explained that the Spatial Durbin Model method takes into account the spatial lag of endogenous and exogenous variables so that it can capture the effects of omitted variables.

The study expelled one province, namely the province of Kalimantan Utara because the province was newly established in 2013, so there was a lack of tourism data.

Table 4.1 Data and Source

Data	Source
Macroeconomy condition	
GDP Regional based on current price	BPS
Consumption per capita	BPS
Employment rate	BPS
Government spending	Ministry of Finance
Working capital loans	Bank Indonesia
Infrastructure condition	
Number of accommodations	BPS
Length of the road with good condition	Ministry of Transportation
Number of the bus company	Ministry of Transportation
Number of buses	Ministry of Transportation
Number of the tour bus company	Ministry of Transportation
Number of the tour bus	Ministry of Transportation
Tourism Condition	
Number of foreign tourists	BPS
Number of domestic tourists	BPS

Data	Source
Star hotel occupancy rate	BPS
Non-star hotel occupancy rate	BPS
Star hotel length of stay	BPS
Non-star hotel length of stay	BPS
Demographic Condition	
Population	BPS
Area	BPS
Indonesia Map	Statsilk.com

The panel data obtained in this study are then examined to determine the amount of missing data and produce a balanced panel data. The results of checking using Stata 15 software only found six missing data from 264 total data used in this study or 2.28% of the total data contained in the data on the number of foreign tourists and the number of domestic tourists. We assume that the missing data on the two variables do not reflect real conditions, where there should be tourists visiting a province, especially the scope of the data used is annual data. Given the relatively small amount of missing data, data interpolation is performed to complete the data.

To produce a robust model, data normality testing is performed, where all data used is recommended to be transformed into logarithmic form. In the process of transforming the data, there are several variables that have zero values, namely the number of the bus companies, the number of buses, the number of the tour bus companies, and the number of the tourist buses. Zero value data for these variables mainly found in eastern Indonesia, the majority of which are remote areas. The zero data will produce an infinite number if directly transformed into the logarithmic form. To anticipate, we add a constant value of 10 to all data in all those four variables that are assumed to represent the actual conditions. Adding a constant value does not violate the statistical rules because it was implemented throughout the data so that the distributions and variations of the data were still relatively the same. Furthermore, the transformation of data into logarithmic form also makes the coefficient of estimation results directly interpreted as elasticity. Considering that the panel data also included time series, data stationarity testing then performed.

4.2. Methodology

The study conducted refers to several previous studies such as Romão and Nijkamp (2018), Vieira and Santos (2017), Yang and Fik (2014), and Yang and Wong (2012), where the assessment

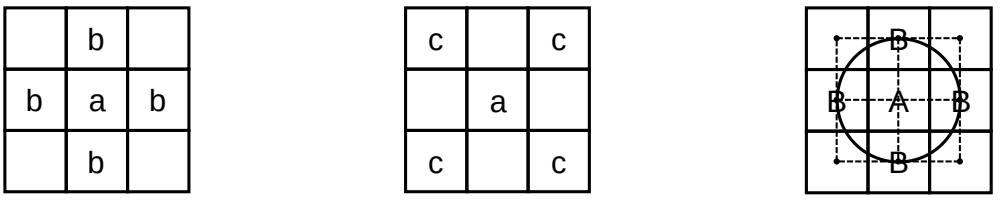
performed by mixing the Geography Information System (GIS) approach with GeoDa software and spatial econometric models processed using Stata 15. The use of GIS aims to obtain clustering patterns of the variables studied and measures the effect of inter-regional spatial relationships. Moreover, the use of GIS will help in generating a weighting matrix of relationships between the area.

4.2.1. Spatial Autocorrelation

One theory that underlies the preparation of various spatial studies was put forward by Tobler (1970), who stated that the relationships amongst variables are also affected by distance. In the context of econometrics, the relationship is known as autocorrelation. According to Gujarati (2009: 413), autocorrelation is a relationship that arises between observations according to time (time-series) or space (cross-section). In line with this, Anselin (2003: 310) stated that spatial autocorrelation is the dependencies or relationships amongst regions. Furthermore, Anselin explains that interactions between economic actors, which are heterogeneous, become one of the keywords in spatial autocorrelation because they can cause collective behavior to influence and creates a specific aggregate pattern. Anselin provides an analogy to illustrate the occurrence of spatial autocorrelation, where the crime rate in one area is also influenced by the crime rate in another area. If this condition is proven or there is a relationship, it can be said that there is a spatial relationship of autocorrelation. Using the same approach, this study tries to see whether the dynamics of tourism in an area is also influenced by the development of tourism in other regions, especially areas that are the center of tourism.

In general, the relation amongst locations divided into three types of relationships, which are a rook, bishop, and queen contiguity (Anselin 2013: 18).

Figure 4.1 Spatial Contiguity



Source: Anselin, L. (2013: 18)

Referring to the types of relations between the regions, this study assumes that the relations between provinces in Indonesia are Queen Contiguity, where social and economic linkages between regions can occur through all directions in the interconnected regions. Determination of the type of linkages between regions in this study was processed using Geoda software. However,

there are limitations in the processing process, where an island will be considered as an isolated area. Anselin (2018) stated that isolated areas will be ignored in determining spatial weights and potentially causing spatial lag estimates to produce spurious correlations. Considering that Indonesia is an archipelago, connectivity between regions is adjusted by using the assumption that the inter-province linkages in Indonesia, mainly related to tourism, also consider the availability of alternative air transportation. Two airlines, namely Garuda Indonesia and Lion Air, are the reference for determining connectivity between regions. These two airlines are widely used by the public and have a flight route maps that can be used as a reference in determining connectivity.

Furthermore, there are two types of spatial autocorrelation, namely global and local, where both are formed from the estimation of Moran indexes (Moran's I) using the spatial weight matrix. The calculation of global and local Moran's I is used to assess the importance of regional relationships. Global Moran's I (*I*) provides information on the overall spatial autocorrelation in the observation. Meanwhile, Anselin (1995: 94) explained that local Moran's I (*Ii*), or commonly called the Local Indicator of Spatial Association (LISA), captures the pattern of the regional grouping. It is further explained that the value of Global Moran's I is a proportional sum of the LISA values. Nonetheless, Anselin emphasizes that the results of the global Moran's I and LISA estimates do not always match because there are patterns of local relationships that different from global trends due to the influence of outlier regions.

In this study, the global Moran's value shows an indication and magnitude of spatial relationships in tourism in Indonesia, whether tourism in Indonesia is grouped in an area or spread over several regions and how strong the spatial relationship is. Meanwhile, the LISA estimation results provide a more specific mapping of each region based on the level of significance and value of Moran's I.

Global Moran's I estimation is conducted to capture the effect of overall spatial autocorrelation through the following equation (Lee and Wong 2001: 157):

$$I = \frac{n \sum \sum w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{W \sum (x_i - \bar{x})^2} \quad \dots (3)$$

Where I is global Moran's I, which shows an indication of spatial autocorrelation that occurs in an observation whether there is a pattern of grouping or spreading. The number of regions is denoted by n, and observation value in every region is symbolized by x_i, x_j with the average value of $\overline{x}$. The row-standardized matrix denoted as *W*. The equation uses the relationship pattern amongst regions to divine a spatial weighted matrix (w_{ij}). This spatial matrix form is binary, where each connected area has a value of 1, while the unconnected region will be 0. Furthermore, matrix

normalization is performed to make the spatial variables comparable and can explain the spatial phenomena (Anselin 2013: 20).

The Moran's I value lies in the range of -1< I <1, where the value of 0< I <1 indicates a positive spatial autocorrelation or an indication of clustering. On the other hand, the value of -1< I <0 indicates a negative spatial autocorrelation or an indication of spreading spatial patterns. Meanwhile, if the value of Moran's I is equal to zero (I=0) indicates there is no spatial autocorrelation, which is also used as the null hypothesis (H_0) in determining the significance of Moran's value.

According to Lee and Wong (2001: 167), the local Moran's I estimation is conducted to measure the spatial value of autocorrelation at the regional level (LISA), which is expressed in the following equation:

$$I_i = z_i \sum_{i=1}^{n} w_{ij} z_j \quad \dots (4)$$

where z_i and z_j are the deviations from the average. Similar to global Moran's I, a spatial weighted matrix is denoted as w_{ij}. One thing to keep in mind from local Moran's I is that each region has its own local Moran's I value, so there are variations in local Moran's I values between regions. The variations become the basis for mapping each region into four quadrants. A high observational area, which is surrounded by other areas of high observation value is shown in the first quadrant (High-High). The second quadrant indicates a region of low observation value followed by areas with high observation value (Low-High). The third quadrant displays a region with low observation values and surrounding regions, which also have low observation values (Low-Low). The fourth quadrant indicates an area of high value followed by areas of low observation value. Areas located in the first quadrant and the fourth quadrant will tend to have positive spatial autocorrelation values. Conversely, areas located in the second quadrants and the third quadrant will tend to have negative spatial autocorrelation values.

4.2.2. Spatial Econometric Model

In accordance with the objectives of this study, the measurement of spatial impact is the main reason in spatial econometric estimation. Anselin (2013: 11) explained that in general, there are two spatial effects in the econometric spatial model, namely spatial dependence and spatial heterogeneity. In general, spatial dependence can be interpreted as the linkage of phenomena in an area due to the influence of the same phenomenon in another area. Using the case in this study,

one example of potential spatial dependence is an increase in tourism performance in a province that is driven by an increase in tourism performance in a connected/neighboring province.

Meanwhile, spatial heterogeneity is the spread of a phenomenon due to differences in conditions and characteristics between regions. For example, the absorption of the tourism workforce is concentrated in the regions of Java and Bali due to better tourism infrastructure support than other regions. In addition, Elhorst (2009: 387) explained that a spatial model in the panel data might have spatial lag variables on dependent variables. The spatial lag model assumes that there is a relationship between dependent variables in the interconnected regions. Following the objectives of this study, it is necessary to consider the influence of connectivity between regions and the impact of spatial spillover as outlined in the spatial weighting matrix.

Furthermore, Anselin (2013: 44) explained that the basic model of spatial regression is as follows:

$$y = \rho Wy + X\beta + u \quad \dots (5)$$
$$u = \lambda Wu + \varepsilon \quad \dots (6)$$
$$\varepsilon \sim N(0, \sigma^2 I)$$

Where *y* and *X* are response variable and explanatory variables, while β is a vector of the regression parameter coefficients, and *W* is the spatial weighting matrix. The spatial lag autoregression coefficient is denoted by ρ. In the basic model of spatial regression there are two types of errors, namely u, which is an error vector which is assumed to have autocorrelation and ε, which is an error vector that does not have autocorrelation. The coefficient of autoregression of spatial error and the identity matrix are denoted respectively with λ and *I*.

LeSage (2008: 23) explained that in the estimation of spatial autoregression, there are three derivative models commonly used, namely:

a. Spatial Autoregressive Model (SAR)

   SAR model is a model formed from a combination of linear regression models with independent variable spatial lag. The addition of spatial lag variables aims to explain variations between regions affected by the surrounding area. The SAR model is formed when the values of $\rho \neq 1$ and $\lambda = 0$ in equations (5) and (6), so the SAR model formulation becomes:

$$y = \rho Wy + X\beta + \varepsilon \quad \dots (7)$$
$$\varepsilon \sim N(0, \sigma^2 I)$$

b. Spatial Error Model (SEM)

   The SEM model is formed when there is only a spatial correlation on the error variable (ε). This condition indicates that there are explanatory variables that have spatial correlations but

are not included in the regression model, so it is assumed to be an error. If the values of ρ = 0 and λ ≠ 0 in equations (5) and (6), the SEM model formulation becomes:

$$y = X\beta + u \quad \dots (8)$$
$$u = \lambda Wu + \varepsilon \quad \dots (9)$$
$$\varepsilon \sim N(0, \sigma^2 I)$$

c. Spatial Durbin Model (SDM)

The SDM model assumes that there is a spatial influence on the dependent and independent variables. This model is developed because spatial dependence occurs both on the dependent variable and also on the independent variable. For example, the increase in labor absorption in a province (dependent variable) is influenced by labor dynamics in other provinces (dependent variable spatial lag) and also the population level in other provinces (explanatory variable spatial lag). The SDM model is formulated with the following equation:

$$y = \alpha \iota_N + \rho Wy + X\beta + \theta WX + u \quad \dots (10)$$
$$u = \lambda Wu + \varepsilon \quad \dots (11)$$
$$\varepsilon \sim N(0, \sigma^2 I)$$

The explanation of the coefficients and variables used in equations (10) and (11) are, in general, the same as those used in equations (5) and (6). In the SDM model, there is the addition of explanatory variable spatial lag, which is denoted by θ, while ι_N is the Nx1 vector for the constant parameter α.

Given that the SDM model considers the effect of spatial lag on dependent and independent variables, spatial interrelationships amongst regions will cause a variable in one region to have a direct effect in the same area and also give an indirect effect to other regions (LeSage and Fischer 2008: 283). In more detail, Elhorst (2010: 19) transformed equation (10) into a *Y* derivative matrix with respect to the *k* number of explanatory variables (*X*) in unit *N*, so the following equation is obtained:

$$\left[\frac{\partial Y}{\partial x_{Nk}}\right] = \begin{bmatrix} \frac{\partial y_1}{\partial x_{1k}} & \cdots & \frac{\partial y_1}{\partial x_{Nk}} \\ \vdots & \cdots & \vdots \\ \frac{\partial y_N}{\partial x_{1k}} & \cdots & \frac{\partial y_N}{\partial x_{Nk}} \end{bmatrix} \quad \dots (12)$$

$$= (I - \rho W)^{-1} \begin{bmatrix} \beta_k & w_{12}\theta_k \cdots w_{1N}\theta_k \\ w_{21}\theta_k & \beta_k & \cdots w_{2N}\theta_k \\ \vdots & \vdots & \ddots & \vdots \\ w_{N1}\theta_k w_{N2}\theta_k \cdots & \beta_k \end{bmatrix} \quad \dots (13)$$

From equation (13), the magnitude of the direct effect is the average of the diagonal elements of the matrix, while the value of the indirect effect is the average of the elements added to the column/row. Furthermore, LeSage and Fischer (2008: 284) explained that the value of indirect effects also describes the level of spatial spillover, while the long-term effect (total effect) is obtained by summing the direct effect and indirect effect.

This study uses two-panel data models to answer research questions. The first model is used to analyze the impact of tourism on economic growth. While the second model is to see the effect of tourism on encouraging employment. The first model is expressed in equations 14, as follows:

$$y_{tour} = \beta_0 + \beta_1 macro_{it} + \beta_2 infra_{it} + \beta_3 tour_{it} + \beta_4 demo_{it} + \rho W * dep.var_{it} + \theta W * indep.var_{it} + \varepsilon_{it} \quad \dots (14)$$

Where y_{tour} is regional economic output (GDP regional) in terms of tourism of province *i* at year *t* as a dependent variable. The data used in this variable refers to current prices, where the current price output can indicate the ability of economic resources produced by the region. A significant output value indicates abundant economic resources and vice versa. The explanatory variables in the first model (equation 14) are grouped into several data criteria, namely macroeconomy (*macro*), infrastructure (*infra*), tourism (*tour*), and demographics (*demo*). Whereas *W * dep.var* is a spatial lag variable of the dependent variable, and *W * indep.var* is a spatial lag variable of the independent variable.

Data on the *macro* criteria describe the conditions of macroeconomic development, which include government spending (*govspend*) and working capital loans (*wcaploan*) data, which have been separated explicitly into the tourism sector. The use of these two data is assumed to represent the government and private sector support in tourism development. Furthermore, the working capital loan variable is used as an investment proxy, bearing in mind that there are many missing data for investment at the provincial level in Indonesia. The use of this variable, in reality, is felt more appropriate to measure the business potential of the community, especially in the tourism sector. This is due to the fact that the majority of working capital loans are intended for medium and low scale businesses. Furthermore, the value of β_1 is expected to be positive.

Data on the *infra* criteria represent the condition of supporting infrastructure for tourism in each province in Indonesia. Some of the variables included in this criterion are the number of accommodations (*naccom*), length of road in good condition (*road*), number of the bus company (*nbuscomp*), number of buses (*nbus*), number of the tour bus company (*ntourbuscomp*), and number of the tour buses (*ntourbus*). The *naccom* variable describes the dynamics of the number of accommodations, which based on BPS (n.d.) explanation of the intended forms of

accommodation, including hotels and non-hotels used for lodging, providing food, obtaining services, and using other facilities with payments mainly related to tourism and recreation activities. Regarding the *road* variable, road length data available in each region in Indonesia is divided according to authority in the implementation of development and maintenance, where there are state roads, provincial roads, and district/city roads. In addition, the road data is also subdivided based on road conditions. In connection with this research, data on the road length is obtained by adding road data in a good quality criterion across all authorities. Referring to Yang and Wong (2012), the road can be a proxy to capture the flow of tourism between regions. Related to the flow of tourism, this study does not use aviation infrastructure data because the dynamics of the data tend to be constant between periods, so there are no data variations that can describe the dynamics of tourism in every province.

The transportation variables in the study, as mentioned before, also used to show the flow of tourists amongst regions and describe regional openness. The study uses bus data because, based on our observations and experience, buses reach many areas at a relatively affordable price and widely used by the public. Nevertheless, there is zero value data in the data bus released by the Ministry of Transportation (2011-2018), which has the potential to cause problems during the data transformation process. In this regard, data adjustments are made by adding constant values of 10 to all data related to the bus. This method does not violate statistical rules because it does not change the distribution and variation of data. Furthermore, the value of β_2 is expected to be positive.

The *tour* criteria uses data which directly related to tourism performance consisting of number of foreign tourists (*infrtour*), number of domestic tourists (*indomtour*), star hotel occupancy rate (*ocupstar*), occupancy rate of nonstar hotel (*ocupnostar*), star hotel length of stay (*starstay*), and length of stay of nonstar hotels (*nostarstay*). Given the research methods that use a spatial approach, then β_3 can be positive or negative. Referring to Yang and Fik's (2014) research, positive values on the coefficient of spatial variables indicate agglomeration amongst regions. On the other hand, the coefficient of spatial variables that are negative indicates the influence of competition that occurs amongst regions.

For *demo* criteria, population and area data are used, which are then processed into population density variables per kilometer (*popden*). Referring to Marrocu and Paci (2013) and Yang and Fik (2014), this variable is used to measure the effect of urbanization and is one proxy for demand so that β_4 can be either positive or negative.

By using these variables, equation 15 can be rewritten as:

$$ytour_{it} = \beta_0 + \beta_1 govexp_{it} + \beta_2 wcaploan_{it} + \beta_3 road_{it} + \beta_4 cnbuscomp_{it} + \beta_5 cnbus_{it} + \beta_6 cntourbuscomp_{it} + \beta_7 cntourbus_{it} + \beta_8 naccom_{it} + \beta_9 infrtour_{it} + \beta_{10} indomtour_{it} + \beta_{11} ocupstar_{it} + \beta_{12} ocupnostar_{it} + \beta_{13} starstay_{it} + \beta_{14} nostarstay_{it} + \beta_{15} popden_{it} + \rho W * dep.var_{it} + \theta W * indep.var_{it} + \varepsilon_{it} \ldots (15)$$

The second model, which is the employment model, is expressed in equations 16, as follows:

$$employ = \beta_0 + \beta_1 macro_{it} + \beta_2 infra_{it} + \beta_3 tour_{it} + \beta_4 demo_{it} + \rho W * dep.var_{it} + \theta W * indep.var_{it} + \varepsilon_{it} \ldots (16)$$

Where *employ* is the number of workers in the tourism sector of the province *i* at year *t* as a dependent variable. Tourism workforce data is obtained based on a national labor force survey (*Survei Tenaga Kerja Nasional*, Sakernas) conducted by BPS. Related to explanatory variables, this second model uses data that is, in general, relatively the same as the first model. Nevertheless, some additional variables are expected to affect employment. This additional variable is not used in the first model to avoid multicollinearity problems; for example, the level of public consumption is a major component affecting economic growth from the demand side in all regions in Indonesia with a share reaching more than 60%.

In the *macro* criteria, consumption per capita variables for food (*concapfood*) and non-food (*concapnofood*) are added. Both of these variables become proxies of demand that are expected to affect employment absorption directly. Furthermore, the value of β_1 is expected to be positive. Meanwhile, in the *infra* criteria, only the number of accommodation (*naccom*) included in the employment model. We assume that this variable can describe labor dynamics in line with the development of the number of accommodations. The value of β_2 is expected to be positive.

The variables in the *tour* criteria used in the employment model are relatively the same as the tourism output model. Even so, β_3 is expected to be positive because even though tourists come from other regions, it is expected to encourage job creation and generate a positive spillover effect.

Meanwhile, we add one additional variable in *demo* criteria, namely the level of literacy (*litrate*). This variable illustrates the effect of human resource quality, which is reflected in the level of literacy. The use of this variable refers to the findings of Yang and Wong (2012) which stated that in the field of tourism, workers' knowledge of tourism objects influences labor productivity. The tourism workers in Indonesia are mostly informal workers and come from the area itself. Related to this, we assume that the employment of tourism can increase as long as prospective workers have some

knowledge of attractions even without having to have higher education so that β_4 is expected to be positive.

By using these variables, equation 17 can be rewritten as:

$$employ_{it} = \beta_0 + \beta_1 concapfood_{it} + \beta_2 concapnofood_{it} + \beta_3 govexp_{it} + \beta_4 wcaploan_{it} + \beta_5 naccom_{it} + \beta_6 infrtour_{it} + \beta_7 indomtour_{it} + \beta_8 starstay_{it} + \beta_9 nostarstay_{it} + \beta_{10} ocupstar_{it} + \beta_{11} ocupnostar_{it} + \beta_{12} litrate_{it} + \beta_{10} popden_{it} + \rho W * dep.var_{it} + \theta W * indep.var_{it} + \varepsilon_{it} \quad \dots (17)$$

4.2.3. Hypothesis

By using both spatial models, as stated earlier, the main hypothesis in this study is government policy and the role of the private sector in the development of tourism through the realization of government spending, and working capital loans have a significant spatial influence in driving the increase in tourism output and absorption of tourism employment.

Chapter 5 Result and Discussion

5.1. Descriptive Analysis

Table 5.1 shows that in total, there are 264 observations in this study. In more detail, the study uses a balanced panel data because the variables all have the same number of observations.

Regarding the dependent variable, the average output of the tourism sector is IDR9,920 billion, with a relatively large standard deviation of IDR21,100 billion. The deviation indicates that the distribution of tourism output data is relatively broad. A relatively similar condition is also seen in the employment of tourism, where the average number of tourism workers is 205,000 persons, while the standard deviation of this variable reaches 322,000 workers. The high value of the standard deviation of the two dependent variables indicates the relatively high disparity in tourism performance amongst provinces in Indonesia. Provinces with its economy based on the tourism sector, such as Bali, or provinces that have high tourism potential supported by adequate infrastructure will tend to generate high tourism output and absorb a higher workforce.

Regarding the dependent variable, the variables related to hotel performance, such as occupancy rates and length of stay, have a relatively low standard deviation level indicating that the data in each province is relatively similar or has a relatively narrow distribution of data. The variables that represent the level of quality of human resources and public consumption also have relatively low standard deviation values. Meanwhile, the variables that describe the supporting tourism infrastructures and facilities have relatively broad data distribution, such as road conditions, the number of accommodations, transport companies, transport fleets, tourism companies, and tourism fleets.

The distribution of working capital loans as a form of support in the development of tourism businesses is relatively high. Meanwhile, government support channeled through government spending has a relatively small distribution close to the average value. Another indicator that illustrates the performance of tourism is the number of tourists, which for foreign tourists seems to have a broad distribution. These conditions indicate that foreign tourists tend only to visit some areas that are relatively well known before. While on the contrary, the diversity of data on the number of domestic tourists is relatively close to average.

Table 5.1 Descriptive Statistics

Variable	Unit	Obs.	Mean	Std.Dev.	Min	Max
GDP on tourism	IDR billions	264	9,920.00	21,100.00	41.60	117,000.00
Tourism employment	1000 person	264	205	322	4	1,756
Food consumption per capita	IDR thousand	264	448	117	225	798
Nonfood consumption per capita	IDR thousand	264	528	171	231	1,200
Star hotel occupancy rate	%	264	49.93	7.75	28.68	80.81
Nonstar hotel occupancy rate	%	264	34.65	9.25	18.77	71.70
Star hotel length of stay	days	264	1.93	0.40	1.22	3.47
Nonstar hotel length of stay	days	264	1.74	0.50	1.07	3.99
Government expenditure on tourism	IDR billions	264	157	140	13	901
Working capital loan on tourism	IDR billions	264	331,000	2,300,000	448	22,400,000
Literacy rate	%	264	94.25	5.73	64.08	99.79
Length of the road with good condition	km	264	6,098.32	4,288.41	478.00	24,609.00
Population density	person/km2	264	1,095.76	3,279.88	2.40	15,623.56
Number of accommodation	unit	264	60.88	78.24	1.00	551.00
Number of foreign tourists	1000 person	264	268.33	825.12	0.10	5,973.98
Number of domestic tourists	Millions person	264	1.23	1.87	0.01	10.60
Number of bus company	firms	264	35.97	32.31	10.00	159.00
Number of buses	unit	264	634.72	1,094.46	10.00	4,552.00
Number of the tour bus company	firms	264	49.97	80.84	10.00	405.00
Number of the tour bus	unit	264	83.12	174.03	10.00	1,182.00

Source: author's calculation

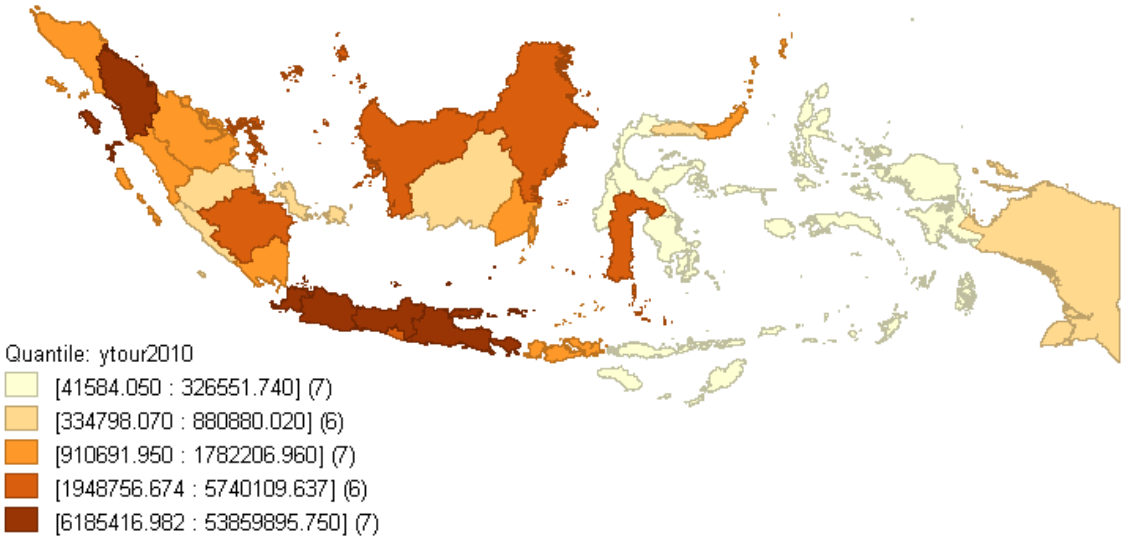
5.2. Spatial Distribution

Figures 5.1 and 5.2 show the pattern of spatial distribution for tourism output in 33 provinces in the initial period of observation (2010) and the final period of observation (2017). Furthermore, to facilitate the comparison, 33 provinces are grouped into six regions according to their geographical location, namely Java, Sumatra, Kalimantan, Sulawesi, Bali-Nusa Tenggara, and Maluku-Papua.

In general, the distribution of tourism output in Indonesia is relatively uneven and concentrated mainly in Java. There are five provinces out of six provinces in the Java region, which are in the highest quantile level group in the period 2010 and 2017; only the Daerah Istimewa Yogyakarta (DIY) province is in the second quantile group. While for the Sumatra region, only the Sumatra Utara province has the highest tourism output during the observation period. In this region, the province of Sumatra Selatan is in the second-highest quantile, along with the province of Lampung, which experienced an increase in tourism output in 2017. For the Kalimantan region, there is a dynamic change in the composition of the distribution of tourism output, where during the observation period, the tourism output in Kalimantan Barat province is declining while

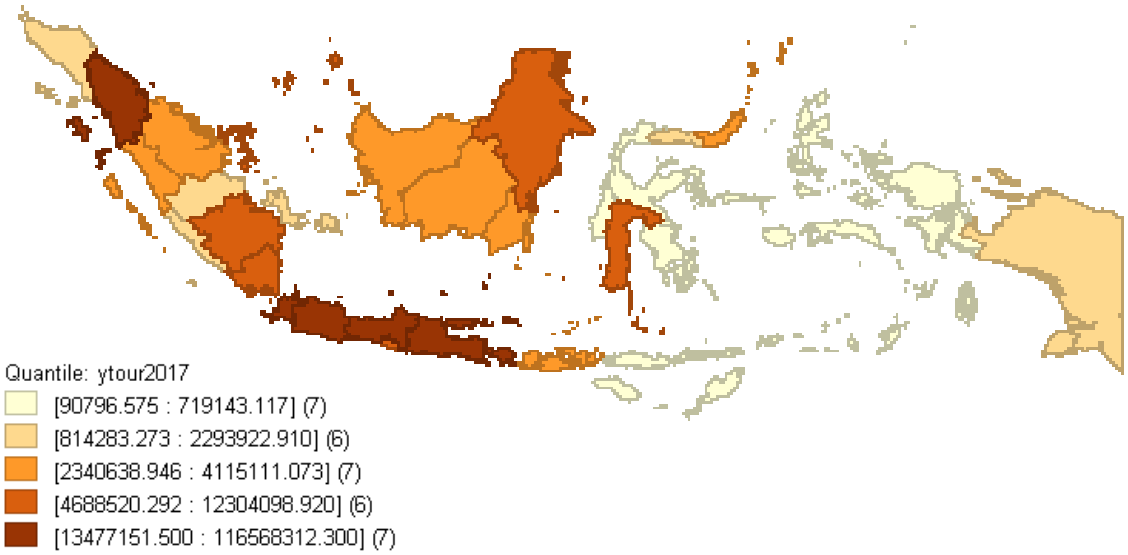
Kalimantan Timur province is increasing. Moreover, the province of Kalimantan Timur has the highest tourism output compares to other provinces in the Kalimantan region during the observation period. Constant conditions occur in the Sulawesi region, where during the observation period there is no change in the composition of the distribution of tourism output. The tourism output of Sulawesi Selatan province is still the highest in the region. The stable distribution also occurs in the Bali-Nusa Tenggara and Maluku-Papua regions, where the province of Bali is one of the provinces in the highest quantile group nationally, and tourism output in the Maluku-Papua region is included in the low quantile group.

Figure 5.1 Output Tourism Spatial Distribution in 2010



Source: author's calculation

Figure 5.2 Output Tourism Spatial Distribution in 2017



Source: author's calculation

In line with tourism output, the conditions of absorption of tourism labor are relatively similar. Figures 5.3 and 5.4 show that during the observation period, the tourism workforce is concentrated in the Java region. The majority of provinces in this region are in the highest quintile group nationally. Furthermore, the proportion of labor distribution in all regions during the observation period is relatively constant.

For the Sumatera region, the province of Sumatera Utara is the only province in the highest quantile group. The dynamics of the distribution of the proportion of tourism labor happen in the Sulawesi region, where there is a decrease in the workforce in Sulawesi Utara province and Gorontalo province. The decline in employment during the observation period also occurs in the Maluku-Papua region, particularly in the Papua province. While, there is an increase in the tourism workforce in the Bali-Nusa Tenggara region, which mainly occurs in the provinces of Nusa Tenggara Barat (NTB) and Nusa Tenggara Timur (NTT) provinces. In addition, the province of Bali is also one of the provinces in the highest national quantile group. Meanwhile, the condition of the tourism workforce in the Kalimantan region is relatively constant.

Figure 5.3 Tourism Employment Spatial Distribution in 2010

Source: author's calculation

Figure 5.4 Tourism Employment Spatial Distribution in 2017

Source: author's calculation

5.3. Spatial Autocorrelation

Lee and Wong (2001: 137) explained that one of the essential foundations in conducting spatial analysis is the determination of relationships between regions, which later will also be used as weighting matrices in econometric spatial models. Related to this, the relationship between regions in this paper is assumed to be in the form of Queen contiguity, where economic relations between regions are assumed to occur as long as the area directly borders (neighbors). If this assumption is fully applied, then some regions in Indonesia will only have one or two regions directly bordering or even isolated, considering that Indonesia is an archipelago. Concerning geographical boundaries, connectivity between areas adapts to flight paths in determining connectivity between areas. It assumes, in reality, flight routes in Indonesia reaches the majority of cities in all provinces so that there are links between regions. Adjustment of relations between regions using flight path connectivity will affect the composition of spatial weighted matrix (W) to be closer to the real condition of connectivity between islands in Indonesia, or other words; there are no isolated islands (see chapter 4). Referring to tourism, the addition of flight routes is one factor that can represent the flow of tourists. There are two most prominent airlines in Indonesia as a reference in determining flight routes, namely Garuda Indonesia and Lion Air. The connectivity amongst provinces is then processed in a Geographic Information System (GIS) using Geoda software as shown in figure 5.5. Next, the value of Moran's I is calculated to observe the spatial autocorrelation between provinces with the null hypothesis is no autocorrelation relationship.

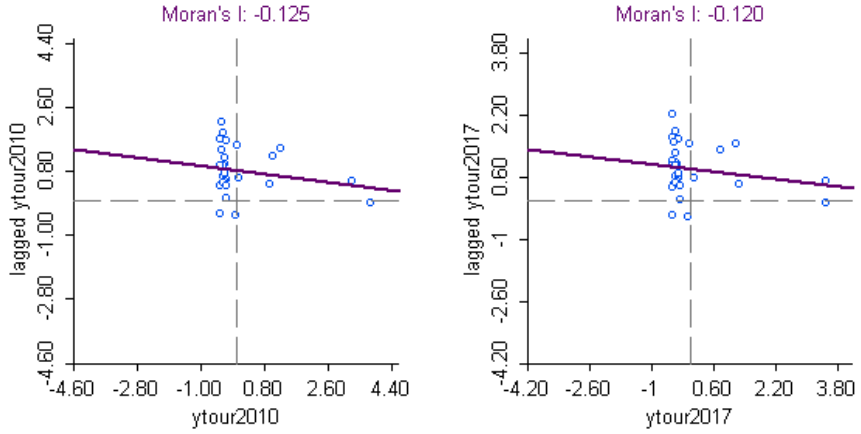
Figure 5.5 Connectivity Graph Between Provinces in Indonesia

Source: author's calculation

5.3.1. Global and Local Spatial Autocorrelation in Tourism Output

The Moran scatter plot graph in figure 5.6 shows that the global Moran index of tourism output in 2010 reaches -0.125 (p-value = 0.076, see appendix). The global Moran index value in 2017 is also relatively the same, which is -0.120 (p-value = 0.073, see appendix). These results indicate that the null hypothesis is rejected, or in other words, there is a relationship of spatial autocorrelation even though the magnitude is relatively small and negative. The negative global Moran index indicates that the pattern of tourism output spreads. It can also be interpreted that there is an imbalance of tourism output between provinces in Indonesia. The estimation results are relatively in line with the descriptive statistical explanation, where tourism output has a high standard deviation. In further explanation, the results of the mapping and processing of LISA also confirm the tendency of imbalanced tourism output.

Figure 5.6 Tourism Output Global Moran's Scatterplot 2010 and 2017



Source: author's calculation

The LISA estimation results, as shown in figures 5.7 and 5.8, strengthen the global Moran estimation results, which generally indicate an imbalance amongst provinces. Based on the distribution of tourism output, provinces that have a dominant tourism output are located in Java. While on the other hand, the majority of provinces have relatively low levels of output, even 16 provinces are indicated not to have a significant spatial tourism output.

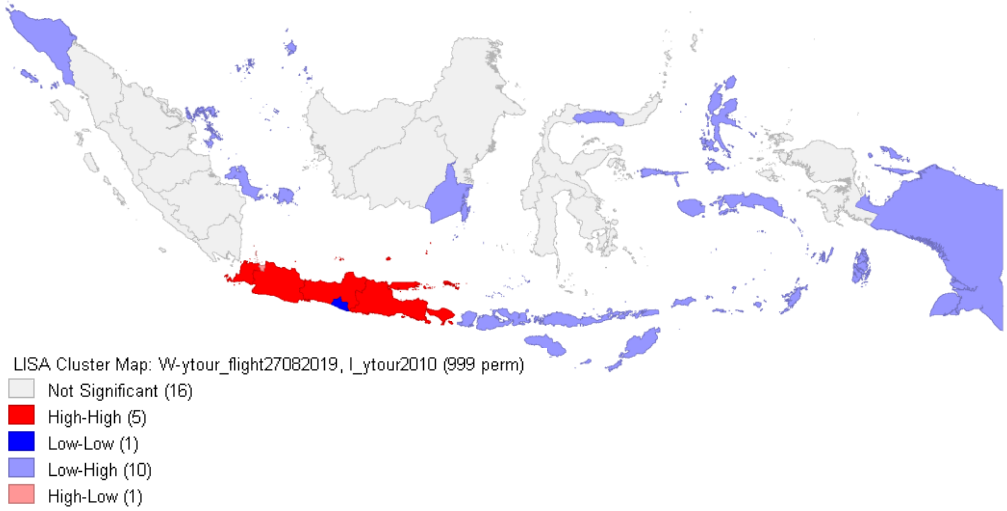
In the Java region, the majority of provinces in this region significantly influence other connected provinces. In the observation period of 2010, there are four provinces in the High-High quadrant, namely Jawa Barat, Jawa Tengah, Jawa Timur, and Banten, indicating that the four provinces have high tourism output and have connectivity with other provinces with also a high level of tourism output. Only the province of DIY is in the Low-Low quadrant, meaning that the tourism output of DIY province is relatively low and has connectivity with other provinces that have low tourism output. The results of the LISA cluster map estimation for the DIY province are beyond

expectations, bearing in mind that the DIY province is one of the provinces that is famous for its tourism potential. Rindrasih et al. (2019) explained that at the end of 2010, there was a volcanic eruption in the province of DIY, which caused the cancellation of more than 2,400 flights from/to the province of DIY. This is one of the causes of the low output of tourism in the DIY province. While, DKI Jakarta province is the only province in the High-Low quadrant. The role of DKI Jakarta province as the center of the national economy, the center of government, and one of the main entrances in Indonesia makes the high output of tourism in the province. Furthermore, there are no significant cluster map changes in the Java region, only Banten province experienced a quadrant shift from High-High to Low-High in 2017, indicating a decline in tourism output in the province.

In the Bali-Nusa Tenggara region, in general, there is no change in the pattern of tourism output clusters during the observation period of 2010 and 2017. In this region, the province of Bali is one of the regions in the High-High quadrant. The result is not surprising considering the economy of the province of Bali is supported by tourism so that the output of tourism in the province of Bali is relatively high. Meanwhile, NTB province and NTT province are in the Low-High quadrant, indicating that tourism output in these two provinces is relatively small but has connectivity links with other provinces that have high tourism output.

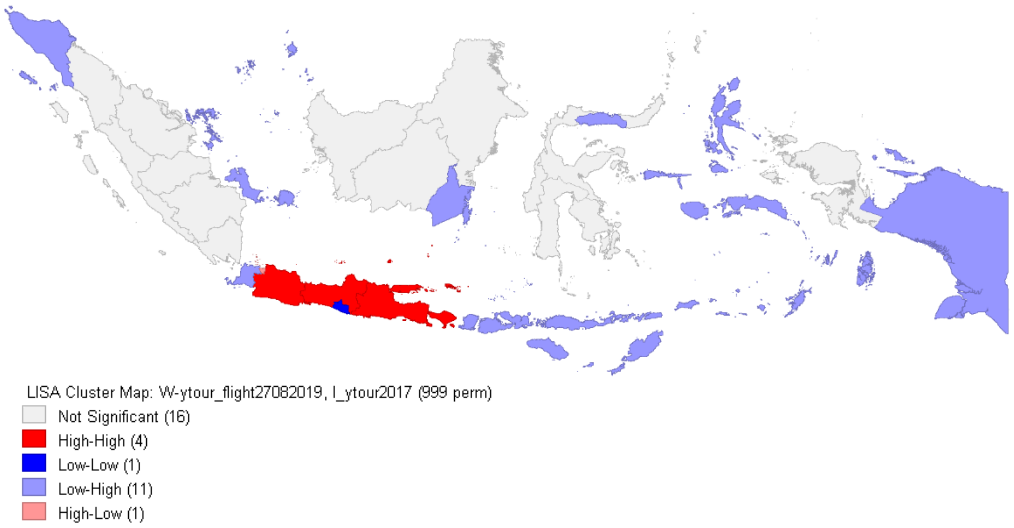
For Sumatera, Kalimantan, Sulawesi, and Maluku-Papua regions, the pattern of tourism output clusters during the 2010 and 2017 periods remain unchanged. Some provinces in the region are in the Low-High quadrant, such as Aceh, Kepulauan Riau, Kepulauan Bangka Belitung, Kalimantan Selatan, Gorontalo, Maluku, Maluku Utara, and Papua. Meanwhile, the Moran index value in 16 provinces in the region has no statistical significance (p-value> 0.05).

Figure 5.7 LISA Cluster Map Output Tourism 2010



Source: author's calculation

Figure 5.8 LISA Cluster Map Output Tourism 2017

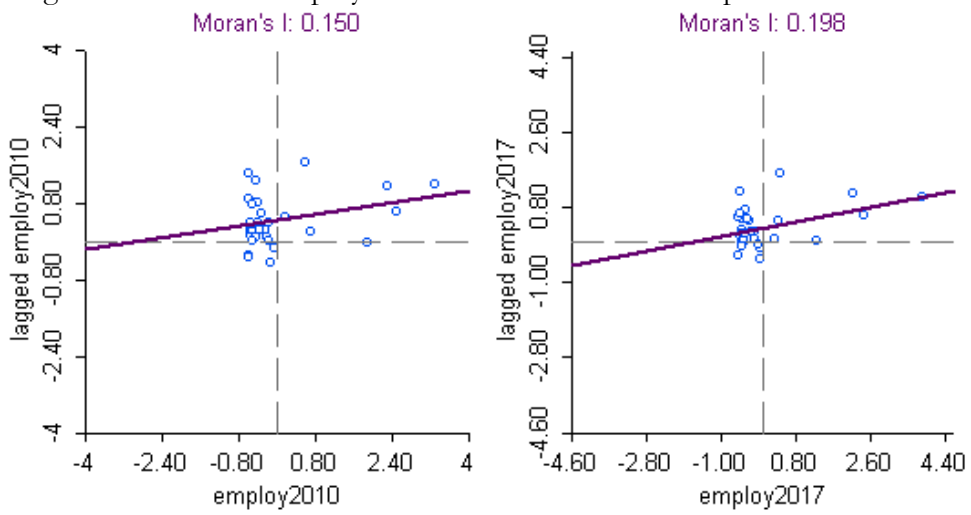


Source: author's calculation

5.3.2. Global and Local Spatial Autocorrelation in Tourism Employment

From the labor side, the Moran scatter plot graph in figure 5.9 shows that the global Moran index value of the number of tourism workers in 2010 is 0.150 (p-value = 0.048, see appendix). Meanwhile, the global Moran index in 2017 is 0.198 (p-value = 0.023, see appendix), indicating that the null hypothesis is rejected, or in other words, there is a relationship of spatial autocorrelation related to tourism labor. Furthermore, the global Moran index is positive, which indicates that there is a clustering pattern in the tourism workforce in provinces in Indonesia. Nevertheless, the Moran index value is relatively small and close to zero, showing that the spatial dependencies related to labor are relatively low.

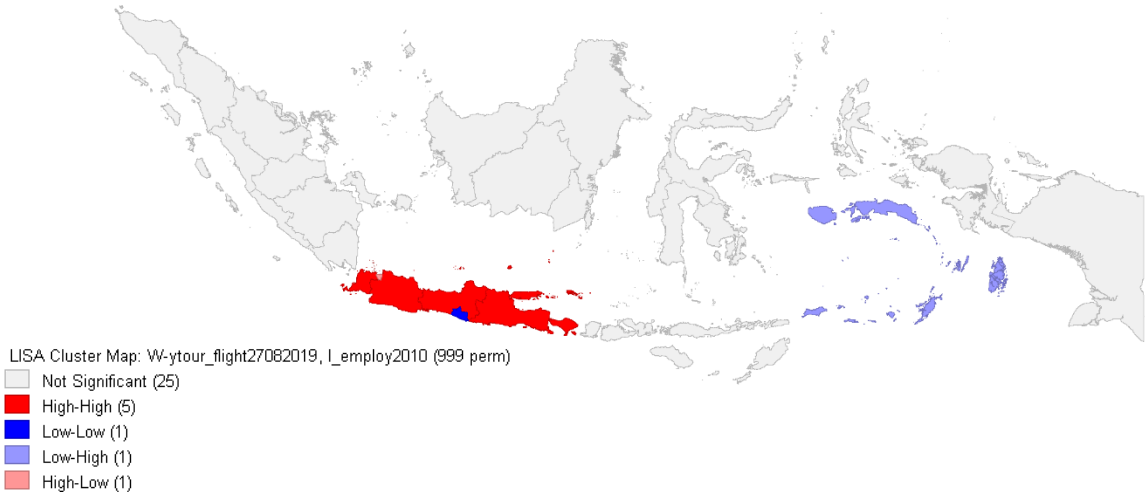
Figure 5.9 Tourism Employment Global Moran's Scatterplot 2010 and 2017



Source: author's calculation

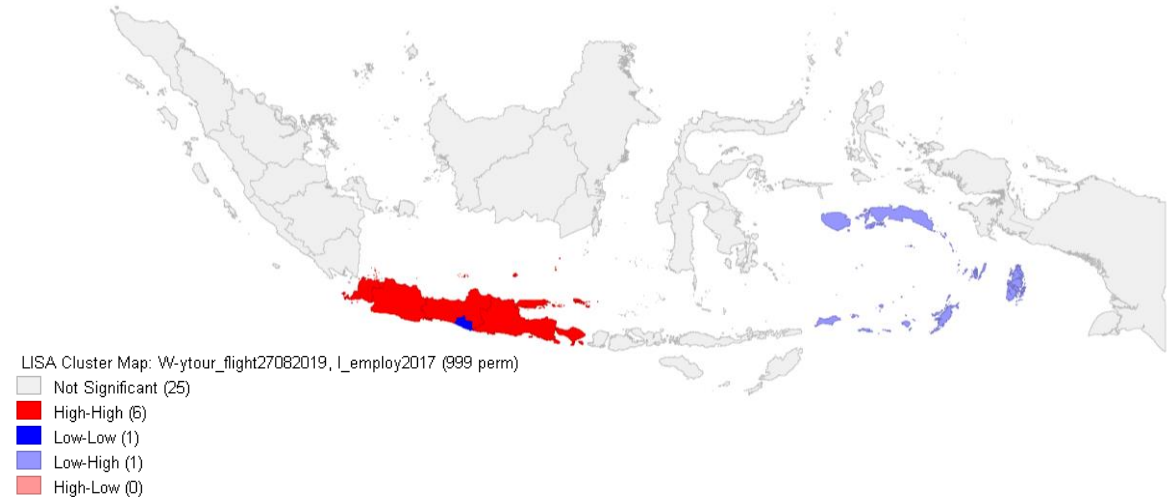
An indication of the cluster pattern of tourism labor is seen in Figure 5.10 and 5.11. In the period 2010 and 2017, the tourism workforce is concentrated in the Java region. The majority of provinces in this region are in the High-High quadrant. In addition, the province of Bali is the only province outside Java that is in the High-High quadrant. On the other hand, the province of DIY is in the Low-Low quadrant. Referring to the Moran index calculation formula, this result shows that the number of workers in the province of DIY tends to be lower than the average number of workers in the surrounding provinces, especially in Java and Bali provinces. Meanwhile, the phenomenon of outliers occurred in Maluku province, where the number of tourism workers is relatively small but significant, so it is grouped in the Low-High quadrant. Furthermore, the number of insignificant provinces (p-value>0.05) indicates that the majority of provinces are relatively insensitive to the spatial dynamics of the tourism workforce. The result shows that tourism is not a major economic sector in most provinces in Indonesia.

Figure 5.10 LISA Cluster Map Tourism Employment 2010



Source: author's calculation

Figure 5.11 LISA Cluster Map Tourism Employment 2017



Source: author's calculation

5.4. Spatial Regression Result

The next stage of spatial analysis conducted in this study is the estimation of the econometric model. The ordinary least square (OLS) is the initial econometric model, but considering that one of the objectives of the study is to determine the effect of spillover amongst regions, the regression model needs to add a spatial weighting matrix to measure spatial influence amongst regions.

Furthermore, Elhorst (2010: 11) explained that the OLS estimation assumes no autocorrelation between variables, while the spatial regression estimation is interdependent amongst regions, which cause the OLS estimation results become bias and inconsistent. Related to this, the performed estimation uses several spatial methods, namely (1) Spatial Durbin Model (SDM), which is assumed to have a spatial influence on the dependent and independent variables, (2) Spatial Error Model (SEM) which assumes that the autoregressive only occurs in the errors generated by the model, and (3) Spatial Autoregressive Model (SAR) which assumes the spatial influence only occurs on the dependent variable. Furthermore, considering the data analyzed in the form of panel data, the Hausman test is performed to determine the use of the fixed effect or random effect model, then followed by the Wald test to select the best model.

5.4.1. Tourism Output Spatial Regression

Table 5.2 shows the estimation results of several regression models to find out the factors that influence tourism output. In general, OLS estimation generates an underestimate or overestimate result because it does not account for spatial influences. Furthermore, based on the results of the Wald test and the Hausman test, the SDM model is statistically appropriate to describe the dynamic condition of tourism output with the fixed effect approach. Henceforth, the result explanation will refer and focus on the results of the SDM model.

The estimation results of the SDM model reveal an effect of spatial autocorrelation, reflected in the ρ value of 0.685, which is statistically significant at the 99% confidence level. The result indicates that each increase in tourism output in a province by 1% will contribute to an increase in tourism output in a connected province by 0.685%. Furthermore, based on the estimation results of the SDM model there are three explanatory variables that have a significant influence on tourism output, namely (1) the length of roads with good conditions, which is a reflection of the condition of infrastructure, (2) the number of tour buses, which are proxies from tourism support facilities, and (3) the number of domestic tourists. Moreover, these three variables also have notations that match expectations.

Meanwhile, the results of spatial lag estimation capture the effect of agglomeration related to tourism output. Tourism output has a positive correlation with private investment, which is proxied by working capital credit. Population movement (urbanization), which is reflected in the spatial lag of population density, also has a significant positive effect. On the other hand, the SDM model captures the potential for inter-regional tourism competition as reflected by the movement of domestic tourists amongst provinces, as reflected by the significance of the negative value on the spatial lag of domestic tourists variable.

Table 5.2 Tourism Output Spatial Regression Results

Variable	OLS	SDM FE	SEM RE	SAR FE
Explanatory Variables (Log)				
Government expenditure	-0.054	0.008	0.014	0.013
	(0.062)	(0.013)	(0.009)	(0.011)
Working capital loan	0.130***	-0.006	-0.012**	-0.010**
	(0.030)	(0.005)	(0.005)	(0.005)
Road length with good conditions	0.027	0.012***	0.011**	0.015***
	(0.053)	(0.004)	(0.005)	(0.005)
Number of bus company	-0.093	0.021	0.023	-0.014
	(0.090)	(0.028)	(0.020)	(0.023)
Number of buses	0.141***	-0.005	0.003	0.004
	(0.054)	(0.007)	(0.008)	(0.006)
Number of the tour bus company	0.234***	0.002	0.016	0.010
	(0.033)	(0.035)	(0.026)	(0.033)
Number of the tour bus	-0.090***	0.010***	0.009**	0.010***
	(0.018)	(0.003)	(0.004)	(0.002)
Number of accommodation	0.403***	0.017	0.022	0.023*
	(0.076)	(0.013)	(0.014)	(0.013)
Number of foreign tourists	0.130***	-0.001	-0.001	0.001
	(0.029)	(0.006)	(0.006)	(0.006)
Number of domestic tourists	0.046	0.023***	0.027**	0.023***
	(0.072)	(0.008)	(0.011)	(0.008)
Star hotel occupancy rate	0.927***	0.061**	0.095***	0.095***
	(0.236)	(0.026)	(0.031)	(0.032)
Nonstar hotel occupancy rate	0.325**	-0.044	-0.083***	-0.075*
	(0.155)	(0.035)	(0.025)	(0.040)
Star hotel length of stay	-0.192	-0.032	0.018	-0.013
	(0.262)	(0.028)	(0.030)	(0.031)
Nonstar hotel length of stay	-0.016	0.050	0.036	0.031
	(0.191)	(0.031)	(0.026)	(0.031)
Population density	0.071**	0.262	0.628***	0.766**
	(0.029)	(0.431)	(0.096)	(0.330)

Variable	OLS	SDM FE	SEM RE	SAR FE
Spatial Lag Explanatory Variables (θ)				
Government expenditure		0.005		
		(0.014)		
Working capital loan		0.033*		
		(0.019)		
Road length with good conditions		0.014		
		(0.011)		
Number of the bus company		-0.051		
		(0.033)		
Number of buses		-0.006		
		(0.015)		
Number of the tour bus company		-0.032		
		(0.086)		
Number of the tour bus		0.010		
		(0.015)		
Number of accommodation		0.008		
		(0.040)		
Number of foreign tourists		0.006		
		(0.017)		
Number of domestic tourists		-0.042*		
		(0.024)		
Star hotel occupancy rate		-0.116		
		(0.075)		
Nonstar hotel occupancy rate		0.149		
		(0.080)		
Star hotel length of stay		-0.061		
		(0.083)		
Nonstar hotel length of stay		0.051		
		(0.063)		
Population density		2.283**		
		(0.945)		
_cons	16.730***		24.632***	
	(1.539)		(0.595)	
Spatial lag (ρ)		0.685***		0.811***
		(0.077)		(0.046)
Spatial error autoregression (λ)			0.962***	
			(0.009)	
N	264	264	264	264
R-squared	0.929	0.980	0.881	0.974
Hausman Test		215.72***	12.980	25.120*
		(df=27)	(df=16)	(df=16)
Wald Test SDM and SAR		49.93***		
Wald Test SDM and SEM		84.30***		

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: author's calculation

Since the SDM model assumes a spatial influence on the dependent and independent variables, it is necessary to estimate direct effects and indirect effects as a basis for the interpretation of parameters in the model (LeSage and Fischer 2008: 283). The direct effect shows the influence that arises in the region itself by considering the influence of the connected area. The indirect effect shows the cumulative effect of spatial overspill that occurs in all regions. Meanwhile, the total effect illustrates the impact in the long run. Table 5.3 displays the results of these calculations.

In terms of direct effects, there are four explanatory variables that have a significant direct effect, namely road length with good conditions, the number of the tour buses, the number of domestic tourists, and population density. The coefficient notation of these four variables is as expected.

The variable road, which is a reflection of the condition of the infrastructure, has a value of 0.016 (α <1%), showing that the development of tourism is closely related to the condition of infrastructure. The result indicates that an increase in the length of roads in province A by 1% will raise the average tourism output in province A by 0.016%. The variable number of tour buses also has a significant influence on tourism output of 0.012, which means an increase in the number of tour buses by 1% will generate an average increase in tourism output in the province itself by 0.012%. In addition, the number of domestic tourists statistically has a significant effect on tourism output, where for every 1% increase in the number of domestic tourists, tourism output in the province will grow by an average of 0.018%. Meanwhile, an increase in population density in a province of 1% will stimulate an average increase in tourism output in the province of 0.676%.

There are two explanatory variables associated with the spillover impact that have significant indirect impacts with the anticipated sign, namely road and population density. An increase in road length and population density in one province by 1% will raise tourism output in other provinces by 0.066% and 7,459%, respectively. In the long run, these two variables also have a significant influence on stimulating tourism output in each province, especially the level of population density. This condition is in line with the effect of urbanization, where an increase in the number of roads will stimulate regional openness to increase demand (Yang and Fik 2014). Meanwhile, the estimation results do not show the influence of competition between regions, reflected in the absence of variables with negative coefficients that statistically provide significant indirect effects.

Table 5.3 Spatial Durbin Model Effect on Tourism Output

Variable	Direct Effect	Indirect Effect	Total Effect
Government expenditure	0.011	0.039	0.050
	(0.015)	(0.056)	(0.065)
Working capital loan	-0.001	0.106	0.105
	(0.008)	(0.115)	(0.121)
Road length with good conditions	0.016***	0.066*	0.082**
	(0.005)	(0.035)	(0.037)
Number of bus company	0.012	-0.138	-0.125
	(0.029)	(0.143)	(0.159)
Number of buses	-0.006	-0.030	-0.036
	(0.009)	(0.064)	(0.070)
Number of the tour bus company	-0.004	-0.125	-0.129
	(0.040)	(0.289)	(0.312)
Number of the tour bus	0.012***	0.051	0.064
	(0.005)	(0.054)	(0.058)
Number of accommodation	0.019	0.060	0.079
	(0.013)	(0.129)	(0.134)
Number of foreign tourists	0.000	0.019	0.019
	(0.006)	(0.055)	(0.057)
Number of domestic tourists	0.018**	-0.096	-0.078
	(0.009)	(0.095)	(0.099)
Star hotel occupancy	0.046	-0.261	-0.216
	(0.034)	(0.313)	(0.337)
Nonstar hotel occupancy	-0.017	0.415	0.397
	(0.047)	(0.389)	(0.420)
Star hotel length of stay	-0.049	-0.281	-0.330
	(0.031)	(0.367)	(0.384)
Nonstar hotel length of stay	0.064	0.280	0.344
	(0.041)	(0.283)	(0.311)
Population density	0.676*	7.459***	8.135***
	(0.371)	(2.136)	(2.158)

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: author's calculation

5.4.2. Tourism Employment Spatial Regression

Table 5.4 shows the regression results of tourism employment models. As the results obtained in the tourism output model, it is generally seen that OLS estimation results tend to overestimate or underestimate because of spatial ignorance. Based on the results of the Wald test and the Hausman test, the SDM model is statistically appropriate to describe the dynamics of tourism employment with the fixed effect approach. Henceforth, the exploration of the estimated results will refer to the SDM model results.

The estimation results of the SDM model exhibit an effect of spatial autocorrelation reflected in the value of ρ of 0.146 with α <10%. The results indicate that each average increase in the number

of tourism employment in the province of 1% will raise the absorption of tourism workers in the province itself on average by 0.146%. Furthermore, there are four explanatory variables that have a significant influence on the tourism employment, namely (1) the distribution of working capital loans, which is a reflection of private business performance related to tourism potential, (2) the amount of accommodation, which is a proxy of tourism supporting facilities, (3) the number of foreign tourists, and (4) the number of domestic tourists. Of the four variables, only domestic tourist variables have negative notation.

Meanwhile, the results of spatial lag estimates capture the effect of agglomeration or competition related to the absorption of tourism labor. The number of tourism workers has a positive correlation with the level of public consumption, especially related to food consumption. Meanwhile, there is competition amongst regions in the star hotel occupancy rate and population.

Table 5.4 Tourism Employment Spatial Regression Results

Variable	OLS	SDM FE	SEM FE	SAR RE
Explanatory Variables (Log)				
Food consumption per capita	-0.334	-0.064	0.153	0.170
	(0.211)	(0.197)	(0.186)	(0.172)
Nonfood consumption per capita	-0.314*	-0.124	-0.004	-0.072
	(0.169)	(0.129)	(0.122)	(0.153)
Government expenditure	0.067	0.000	0.037	0.033
	(0.056)	(0.034)	(0.034)	(0.045)
Working capital loan	0.146***	0.036**	0.043**	0.066***
	(0.026)	(0.015)	(0.018)	(0.021)
Number of accommodation	0.378***	0.209***	0.217***	0.320***
	(0.064)	(0.049)	(0.047)	(0.065)
Number of foreign tourists	0.076***	0.052*	0.049	0.081***
	(0.023)	(0.028)	(0.031)	(0.026)
Number of domestic tourists	0.064	-0.121***	-0.123**	-0.121**
	(0.063)	(0.046)	(0.052)	(0.05)
Star hotel length of stay	-0.580**	0.187	0.139	0.085
	(0.226)	(0.163)	(0.145)	(0.152)
Nonstar hotel length of stay	-0.507***	0.032	0.017	-0.154
	(0.16)	(0.128)	(0.125)	(0.126)
Star hotel occupancy rate	0.925***	0.160	0.199	0.305**
	(0.195)	(0.132)	(0.126)	(0.153)
Nonstar hotel occupancy rate	0.215*	-0.156	-0.126	-0.021
	(0.128)	(0.133)	(0.13)	(0.121)
Literacy rate	0.191	0.565	0.347	0.667
	(0.437)	(0.726)	(0.625)	(0.597)
Population density	0.157***	0.876	2.441***	0.391***
	(0.023)	(0.904)	(0.707)	(0.062)

Variable	OLS	SDM FE	SEM FE	SAR RE
Spatial Lag Explanatory Variables (θ)				
Food consumption per capita		1.016***		
		(0.346)		
Nonfood consumption per capita		0.282		
		(0.354)		
Government expenditure		-0.039		
		(0.094)		
Working capital loan		0.088		
		(0.058)		
Number of accommodation		0.022		
		(0.178)		
Number of foreign tourists		-0.067		
		(0.107)		
Number of domestic tourists		-0.021		
		(0.133)		
Star hotel length of stay		0.098		
		(0.238)		
Nonstar hotel length of stay		-0.565*		
		(0.301)		
Star hotel occupancy rate		-0.025		
		(0.518)		
Nonstar hotel occupancy rate		0.183		
		(0.315)		
Literacy rate		1.176		
		(1.523)		
Population density		-4.520**		
		(2.214)		
_cons	5.434**			-1.344
	(2.511)			(2.839)
Spatial lag (ρ)		0.146*		0.183**
		(0.087)		(0.082)
Spatial error autoregression (λ)			0.217**	
			(0.098)	
N	264	264		0.811
R-squared	0.9124	0.512	0.4639	0.4522
Hausman Test		215.72***	29.57***	19.11
		(df=27)	(df=14)	(df=14)
Wald Test SDM and SAR		65.43***		
Wald Test SDM and SEM		62.47***		

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: author's calculation

As explained earlier, the interpretation of the SDM model estimation results uses the direct effect and indirect effect approaches, as shown in table 5.5. In terms of direct effects, there are four explanatory variables that have a significant direct effect, namely working capital loan, the number of accommodation, the number of foreign tourists, and the number of domestic tourists. The

coefficient for the working capital loan variable has a value of 0.038, with α <1%. It means an increase in working capital credit in a province will raise employment in the province by 0.038%. In its realization, working capital loans are a reflection of the private business response. Therefore an increase in this variable indicates promising business opportunities for the private sector and will contribute to employment. The number of accommodation and the number of foreign tourists also have a significant impact on the employment of tourism workers with the magnitude of 0.209 and 0.051, respectively. It means an increase of 1% in the number of accommodations and foreign tourists in a province, will raise tourism employment in the province by 0.209% and 0.051%, separately.

On the other hand, the number of domestic tourists has a significant negative effect, where each increase in the number of domestic tourists in a province by 1% will cause a decrease in the employment of tourism in the province by an average of 0.122%. This finding is exciting and can open a new discussion room considering the majority of policymakers in Indonesia consider that tourism performance improvement, one of which is reflected by the number of tourists will drive employment.

Some previous research results confirm the occurrence of the phenomenon of a negative correlation between the number of domestic tourists and employment. First, the results of ILO (2011) study showed that tourism workers in Indonesia are mostly informal workers with relatively low-income levels. In addition, work patterns for formal workers in the tourism sector require longer working hours; for example, the hotel business operates for 24 hours, especially during the holiday season. This pattern of work and relatively unequal income causes a high turnover of tourism workers. Second, tourism performance in Indonesia is seasonal. Therefore it is unsustainable. Third, the character of domestic tourists is more likely to choose a tourism location that is affordable in terms of cost, location, and time causing the role of domestic tourists to drive tourism performance to be less than optimal (Seckelmann 2002). Fourth, by looking at the three previous factors, there is a potential for the phenomenon of tourism labor migration. Seckelmann (2002) stated that regions with an underdeveloped tourism sector are a source of cheap labor for regions with a more developed tourism sector.

There are three explanatory variables associated with the spillover effect that have significant indirect impacts, namely food consumption per capita, nonstar hotel length of stay, and population density. The food consumption has a positive spatial effect, where each increase of 1% will generate an employment increase in the connected provinces by 1,151%. Meanwhile, there is a phenomenon of inter-regional competition in hotel performance, especially in nonstar hotel length

of stay. The longer tourists stay in other provinces will cause a decrease in the absorption of tourism workers in the connected provinces. Meanwhile, the estimation result on population density captures the phenomenon of labor migration. In the long run, the level of food consumption per capita and the realization of working capital loans have a significant effect on increasing the tourism workforce in each province. On the other hand, labor migration has a significant adverse effect on employment. Meanwhile, the quality of human resources, which is proxied by the level of literacy, does not have a significant influence on the absorption of tourism labor. This result is in line with the previous explanation, where the majority of tourism workers are informal and do not have high education.

Table 5.5 Spatial Durbin Model Effect on Tourism Employment

Variable	Direct	Indirect	Total
Food consumption per capita	-0.035	1.151***	1.117**
	(0.199)	(0.376)	(0.448)
Nonfood consumption per capita	-0.123	0.317	0.195
	(0.132)	(0.431)	(0.508)
Government expenditure	0.002	-0.040	-0.038
	(0.032)	(0.117)	(0.119)
Working capital loan	0.038***	0.108	0.146**
	(0.015)	(0.067)	(0.069)
Number of accommodation	0.209***	0.052	0.261
	(0.048)	(0.191)	(0.208)
Number of foreign tourists	0.051*	-0.074	-0.024
	(0.027)	(0.119)	(0.123)
Number of domestic tourists	-0.122***	-0.038	-0.160
	(0.045)	(0.148)	(0.146)
Star hotel length of stay	0.189	0.131	0.320
	(0.15)	(0.266)	(0.273)
Nonstar hotel length of stay	0.028	-0.623*	-0.595
	(0.124)	(0.324)	(0.393)
Star hotel occupancy rate	0.163	-0.009	0.154
	(0.128)	(0.599)	(0.619)
Nonstar hotel occupancy rate	-0.164	0.150	-0.014
	(0.132)	(0.362)	(0.435)
Literacy rate	0.637	1.331	1.968
	(0.776)	(1.705)	(2.094)
Population density	0.806	-5.150**	-4.344**
	(0.804)	(2.389)	(2.089)

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: author's calculation

5.5. Discussion

The estimation results with the spatial approach in this study reveal some interesting findings related to the condition of tourism in Indonesia. During the observation period, the pattern of

tourism output in Indonesia indicates inequality, with the largest output being in Java and Bali. While labor absorption appears to have a clustering pattern, although some regions appear to be insensitive to changes in employment. Referring to the explanation of Myrdal (1953) in Meardon (2001), this condition indicates a backwash effect where labor resources are absorbed into some areas with high tourism output. The results of Seckelmann's (2002) study also reinforce this point, where regions with an advanced tourism sector will tend to absorb cheap labor from less developed regions. In line with this, the estimation results show that there is an indication of a negative spillover effect, which is mainly influenced by the population. In the long term, the tourism sector has not been able to absorb the potential of the available labor force, reflected in a significant negative effect on the population density variable. The result contrasts with the study by Frenken et al. (2005), which stated that population increase has no significant effect on job creation when economic localization occurs.

As stated in the beginning of this study, one of the primary considerations of the government in establishing tourism as the leading sector in Indonesia is the high foreign exchange earnings from tourism. However, empirical estimation results show that the number of foreign tourists does not have a significant spatial influence. Therefore foreign exchange income from tourism is potentially less optimal. On the other hand, domestic tourists empirically have a significant effect on employment and tourism output, despite the phenomenon of competition between regions. In addition, the role of the government through spending in the tourism sector also does not have a significant spatial impact on increasing tourism output and employment. This phenomenon is relatively similar to the findings of Jan-Hospers (2003), where the development of local tourism, which is a top-down policy, is relatively less optimal while the bottom-up policies have only a positive impact in the short term.

Chapter 6 Conclusion

In the national scope, tourism has the potential to become one of the sectors that can boost the economy and absorb labor. Therefore the Indonesian government choose the tourism sector as a leading sector considering the tourism potential and positive effects that can be obtained. Nonetheless, high disparities amongst proveinces in Indonesia can contribute to a failure in tourism sector development policies. In addition, differences in conditions amongst provinces generate an agglomeration phenomenon which, if not properly anticipated, will trigger a higher level of inequality amongst provinces.

This study tries to examine the effect of government policies related to optimizing the tourism sector as an effort to boost the economy and to overcome unemployment problems in 33 provinces in Indonesia. This study uses a spatial econometric approach because this method is considered to be able to meet the research objectives. Government spending in the tourism sector is a proxy for government support. Meanwhile, the distribution of working capital loans reflects the response of businesses to the potential of the tourism sector. This study also considers the effect of public demand, which is reflected in per capita consumption. In addition, the condition of infrastructure, tourism data, and demographics are variables that are estimated to have an influence on tourism performance and employment in the tourism sector spatially.

The estimation results show that there are two different spatial patterns, where tourism output has a disperse pattern while the workforce experiences the phenomenon of agglomeration. Based on the distribution patterns that are formed, the research hypothesis is not fully proven. Government spending in the tourism sector does not have a significant effect on increasing output and employment. Meanwhile, the realization of working capital loans only has a significant effect on employment in the tourism sector.

The results of further processing show that some factors have a positive and negative spillover effect in the tourism sector. In terms of tourism output, infrastructure conditions have a dominant positive spillover effect in the long run. Meanwhile, in terms of employment, there are two factors that predominantly provide a positive spillover effect, in the long run, namely the distribution of working capital loans and consumption per capita for food commodities. The spatial population generates a positive influence on tourism output in the long run. While on the other hand, it also has a negative impact on employment. The character of the tourism sector which tends to be seasonal and typically work patterns in the tourism sector generate problems of less optimal absorption of the potential workforce that is owned by each province. Domestic tourists have a

significant spatial influence on output and employment in the tourism sector in the short term. Meanwhile, foreign tourists do not have a significant spatial effect on tourism performance. The result shows that top-down tourism optimization policies in Indonesia only have a short term impact. In addition, this finding also suggests that the government's decision in determining tourism as a source of national foreign exchange income needs to be re-evaluated.

Given the complexity of the tourism sector and the limited scope of the analysis in this study, further studies are needed to obtain more comprehensive information on the effects of tourism in Indonesia. Considering that one of the goals of tourism development in Indonesia is to increase foreign exchange earnings, the use of global economic data is worth to be considered because it can be a proxy for foreign tourist demand. In addition, the use of primary data through surveys of business actors and related parties can be conducted to obtain a more realistic picture of the development of the tourism sector. The use of more detailed data, for example, a district or a city level, can be considered to be conducted to obtain more in-depth estimation results.

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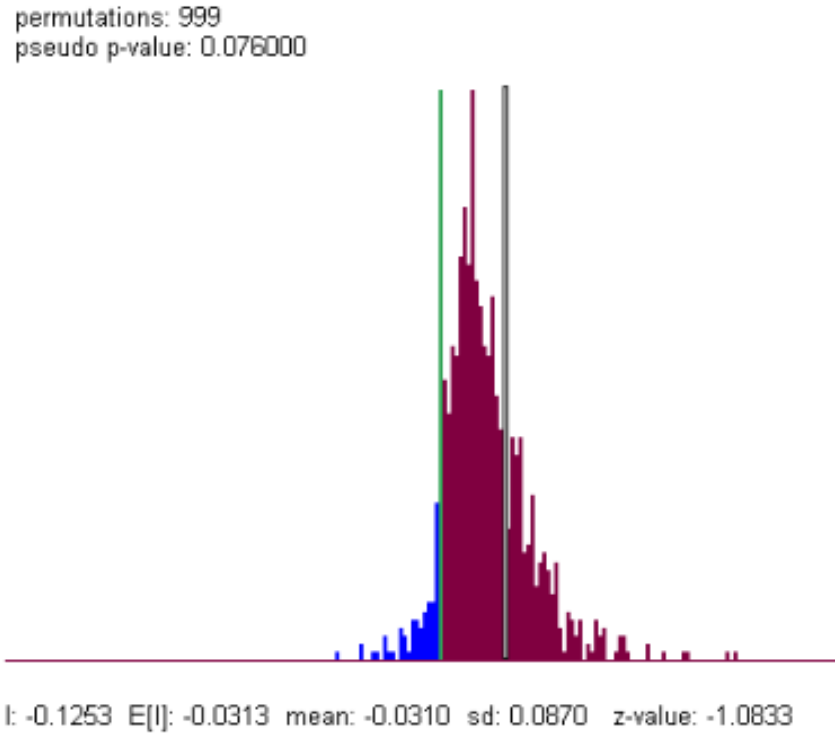
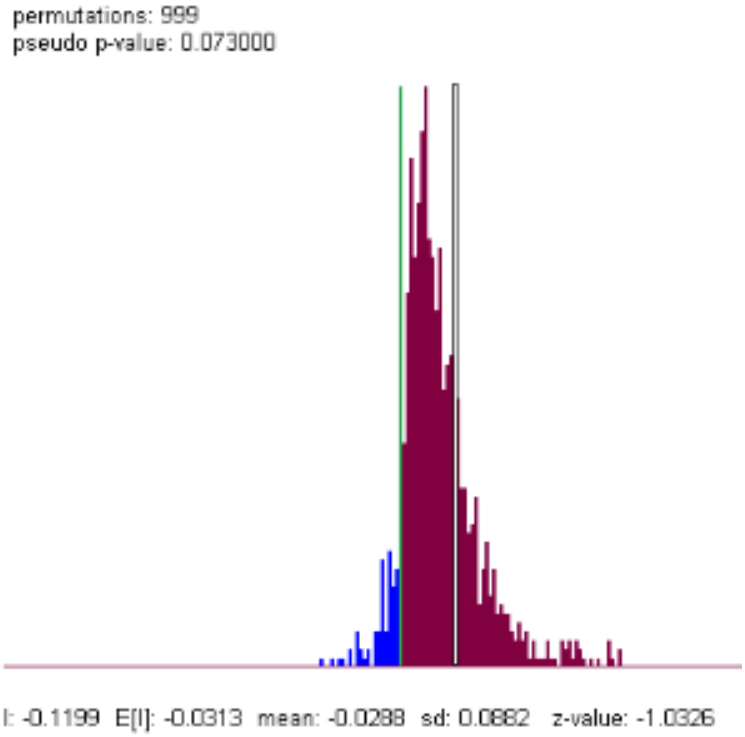
Appendices

Figure A.1. Global Moran's Tourism Output 2010 Randomization in Indonesia



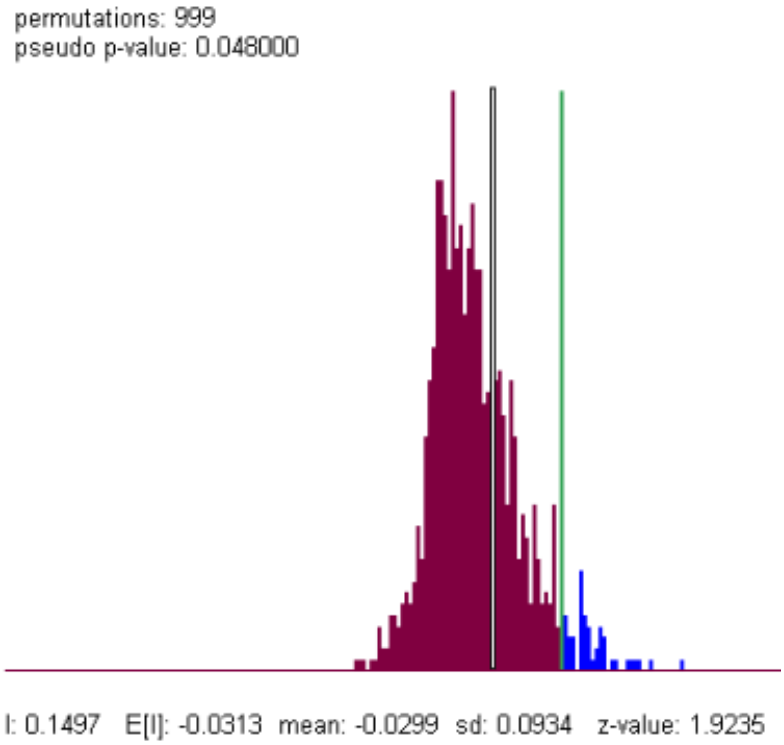
Source: author's calculation

Figure A.2. Global Moran's Tourism Output 2017 Randomization in Indonesia



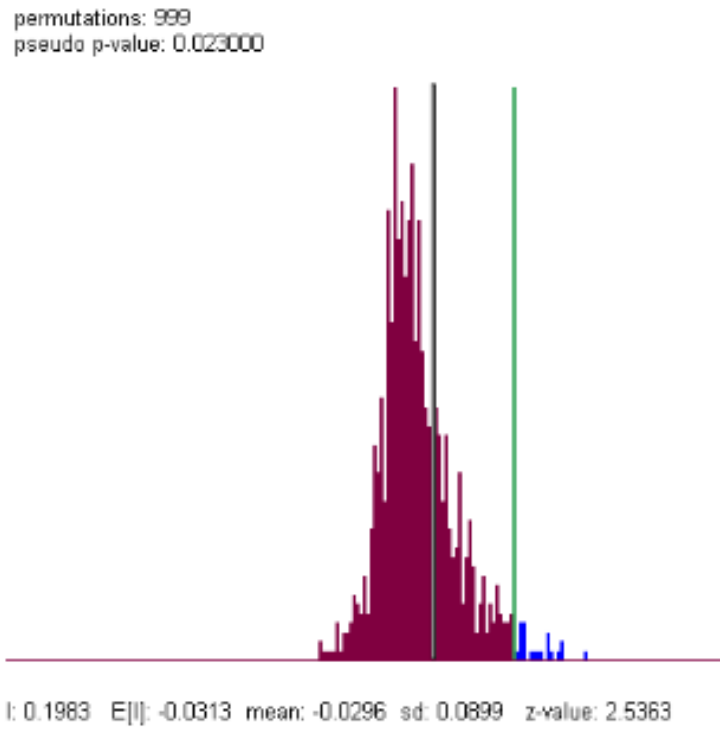
Source: author's calculation

Figure A.3. Global Moran's Tourism Employment 2010 Randomization in Indonesia



Source: author's calculation

Figure A.4. Global Moran's Tourism Employment 2017 Randomization in Indonesia



Source: author's calculation

Table A.1. LISA Estimation Result

Province	Tourism Output 2010		Tourism Output 2017		Tourism Employment 2010		Tourism Employment 2017	
	LISA Index	LISA Significancy	LISA Index	LISA Significancy	LISA Index	LISA Significancy	LISA Index	LISA Significancy
Aceh	-0.786	0.012**	-0.735	0.012**	-0.577	0.072*	-0.329	0.186
Sumatera Utara	0.039	0.107	0.039	0.129	0.134	0.354	0.023	0.387
Sumatera Barat	-0.206	0.133	-0.184	0.141	-0.096	0.272	-0.021	0.419
Riau	-0.198	0.123	-0.175	0.127	-0.068	0.262	-0.017	0.411
Jambi	-0.185	0.166	-0.166	0.183	-0.041	0.403	-0.007	0.439
Sumatera Selatan	-0.134	0.175	-0.103	0.210	-0.004	0.481	0.013	0.473
Bengkulu	-0.206	0.180	-0.190	0.208	-0.081	0.383	-0.017	0.438
Lampung	-0.256	0.087*	-0.225	0.089*	-0.073	0.206	-0.050	0.277
Kepulauan Bangka Belitung	-0.730	0.019**	-0.692	0.020**	-0.492	0.170	-0.283	0.184
Kepulauan Riau	-0.539	0.020**	-0.495	0.030**	-0.341	0.180	-0.198	0.177
DKI Jakarta	-0.304	0.002***	-0.251	0.002***	-0.006	0.001***	0.023	0.001***
Jawa Barat	1.804	0.001***	1.725	0.001***	3.940	0.001***	4.120	0.001***
Jawa Tengah	1.247	0.001***	0.964	0.001***	2.636	0.001***	2.481	0.001***
DI Yogyakarta	0.013	0.034**	0.028	0.032**	0.069	0.042**	0.041	0.044**
Jawa Timur	1.705	0.002***	1.733	0.002***	1.601	0.004***	1.513	0.004***
Banten	0.005	0.008***	-0.040	0.011**	0.948	0.012**	0.642	0.016**
Bali	0.429	0.008***	0.539	0.009***	0.079	0.010***	0.171	0.010***
Nusa Tenggara Barat	-0.397	0.028**	-0.391	0.027**	-0.163	0.251	-0.081	0.289
Nusa Tengggara Timur	-0.460	0.027**	-0.470	0.025**	-0.197	0.226	-0.151	0.250
Kalimantan Barat	-0.334	0.057*	-0.323	0.078*	-0.137	0.290	-0.052	0.298
Kalimantan Tengah	-0.285	0.094*	-0.252	0.135	-0.126	0.334	-0.035	0.402
Kalimantan Selatan	-0.434	0.002***	-0.472	0.001***	-0.211	0.076**	-0.190	0.096*
Kalimantan Timur	-0.177	0.070*	-0.177	0.067*	-0.024	0.400	-0.016	0.422
Sulawesi Utara	-0.401	0.063*	-0.370	0.090*	-0.176	0.276	-0.086	0.300
Sulawesi Tengah	-0.188	0.213	-0.166	0.268	-0.003	0.494	0.058	0.473
Sulawesi Selatan	-0.013	0.436	-0.008	0.472	0.012	0.254	0.016	0.212

Province	Tourism Output 2010		Tourism Output 2017		Tourism Employment 2010		Tourism Employment 2017	
	LISA Index	LISA Significancy	LISA Index	LISA Significancy	LISA Index	LISA Significancy	LISA Index	LISA Significancy
Sulawesi Tenggara	-0.462	0.090*	-0.427	0.114	-0.237	0.296	-0.113	0.314
Gorontalo	-0.436	0.041**	-0.444	0.041**	-0.152	0.299	-0.093	0.355
Sulawesi Barat	0.183	0.416	0.184	0.418	0.199	0.499	0.189	0.487
Maluku	-1.018	0.002***	-1.037	0.002***	-0.858	0.011**	-0.688	0.023**
Maluku Utara	-0.825	0.025**	-0.775	0.030**	-0.551	0.178	-0.349	0.202
Papua Barat	0.174	0.444	0.172	0.442	0.183	0.484	0.198	0.466
Papua	-0.627	0.003***	-0.650	0.002***	-0.394	0.051*	-0.368	0.061*

Note: *** p<0.01, ** p<0.05, * p<0.1. Source: author's calculation