DETERMINANTS OF TOURISM DEMAND IN SARAWAK: AN AUGMENTED GRAVITY MODEL

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ABSTRACT

Tourism is an important industry in Sarawak. It plays a vital role to further boost the Sarawak income and increasing its efforts to shift its economic activities from a resource-based to a service-based economy. In order to ensure its sustainable growth, this paper investigated the determinants affecting tourism demand in Sarawak from a macroeconomic perspective using annual data from 2010 through 2016. An augmented gravity model is adopted and analyzed using the static panel approach. The empirical findings reveal that the income level in origin country is negatively affecting tourism demand in Sarawak which is contributed to current literature gap. Additionally, the income level in Sarawak is positively influencing tourism demand in Sarawak, suggesting further tourism development is essential to attract more tourists to visit Sarawak. Meanwhile, higher transportation cost and tourism price will discourage tourists visit to Sarawak. Thus, the feasible strategic plans and action plans should be addressed by the Sarawak government for tourism development in long term.

Keywords: Tourism demand, Augmented gravity model, Panel analysis.

1.   Introduction

Tourism industry is playing the crucial role in Sarawak. It is located on the island of Borneo or land of hornbills, the 3rd largest island in the world, north of equator. With its beautiful blue skies and tropical breezes you can bathe in the sandy beaches and palm-fringed state of Sarawak. Sarawak is the largest state in Malaysia and home of 27 ethnic groups with its own distinct language, culture and lifestyle.

Sarawak has an equatorial climate with tropical rainforests, abundant animal and plant species which suit for adventure. Sarawak encompasses the Rajang River which is the longest river in Malaysia; the Bakun Dam, one of the largest dams in Southeast Asia; and the Niah Cave, one of the earliest human settlements in the region. Officially, Sarawak was granted self-government on 22 July 1963, and formed Malaysia by uniting Malaya, Sabah, Sarawak and Singapore on 16 September 1963.

Since 1985, Sarawak tourism has started to play a crucial role in supporting the State's economic growth, and it would not surprise for surpassing agriculture and manufacturing sector in the time of future. Sarawak's tourist arrivals increased by 42.4% to 4.7 million tourists in 2016 compared to merely 3.3 million tourists in 2010 (Ministry of Tourism, Arts, Culture, Youth and Sports Sarawak, 2017a). The growth in the number of tourist arrivals had raised the tourism receipts from RM5.8 billion in 2010 to RM8.4 billion in 2016, with an annual growth of about 7.5% averagely. This showed that Sarawak tourism is full of potential to lift up the Sarawak economic growth in a faster pace.

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Sarawak tourism has been identified as a key industry player to boost Sarawak's economy. According to Department of Statistics Malaysia (2017), the services sector was comprised 34.4% of Sarawak gross domestic product (GDP) in 2016. Among 34.4%, tourism industry contributed 7.9% or about a quarter of total contribution in services sector. Thus, top priority has been given to tourism development in Sarawak due to the depressed growth in the oil industry (Then, 2018).

Table 1: Top Ten Inbound Tourist Countries to Sarawak Tourism, 2016

Country	Tourist Arrivals (Person)	Percentage (%)
Brunei	1,395,013	61.8
Indonesia	480,581	21.3
Philippines	73,657	3.3
Singapore	40,209	1.8
China	38,345	1.7
United Kingdom	31,274	1.4
India	28,854	1.3
Australia	18,500	0.8
Thailand	15,609	0.7
Japan	11,478	0.5

Source: Ministry of Tourism, Arts, Culture, Youth and Sports Sarawak, 2017b.

Table 1 shows the top ten inbound tourist countries to Sarawak in 2016. These ten inbound tourist countries make up of 94.5% of total international tourist arrivals into Sarawak in 2016. Given the critical role played by these ten major countries, it is vital to identify the determinants affecting tourism demand in Sarawak.
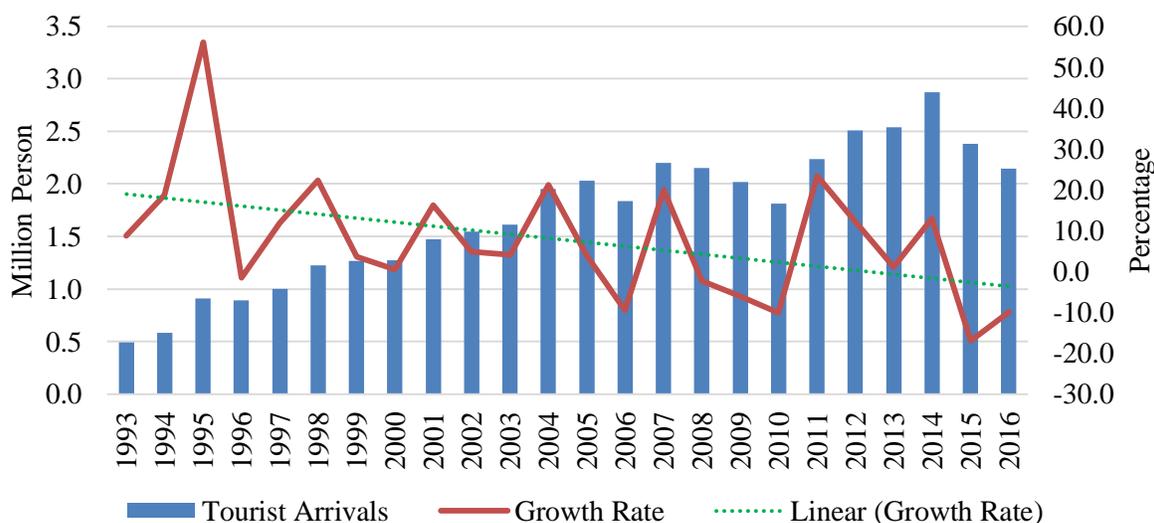

Figure 1: Total Top Ten Inbound Tourist Origin Countries and its Growth Rate in Sarawak, 1993-2016
Source: Sarawak Visitor Arrivals 2016, Ministry of Tourism, Arts, Culture, Youth and Sports Sarawak, 2017b.

Furthermore, Figure 1 reveals the number of tourist arrivals and its growth rate for ten inbound tourist countries into Sarawak from 1993 to 2016. On overall, the number of tourist arrivals is increasing over the time while its growth rate is fluctuated and showing the downward trend since 1993 through 2016. This illustrates that the number of tourist arrivals is increasing at the diminishing rate which extra

attention is needed by the government to figure out the factors affecting the tourism fluctuations. Therefore, this critical issue furthers motivate this study to be set out to investigate the determinants affecting tourism demand in Sarawak.

2. Literature Review

In the study of tourism demand, gravity model has been utilized by a number of studies such as Kaplan and Aktas (2016), Gouveia et al. (2017), and Chaney (2018) to identify the determinants affecting tourism demand in their country of studies. This model was developed by Tinbergen (1962) and further extended by Poyhonen (1963) based on the Newton's universal law of gravitation to illustrate the patterns of international trade. Also, gravity model has been extensively utilised in the study of international trade (McCallum, 1995; Rose, 2000; Anderson & Wincoop, 2003; Chaney, 2018), migration (Karemera et al., 2000; Gil-Pareja et al., 2007), foreign direct investment (Bergstrand & Egger, 2007; Falk, 2016).

In previous research, tourist arrivals (Song & Li, 2008; Song et al., 2012; Ooi et al., 2013; Puah et al., 2014; Puah et al., 2018) and tourism receipts (Au & Law, 2002; Witt et al., 2004; Song et al., 2010; Smeral & Weber, 2010) are widely employed to proxy tourism demand.

Meanwhile, existing studies on determinants affecting tourism demand consist of income variable, transportation cost, tourism price and other significant variables. Income variable is usually determined by GDP of tourist's country. The income level is found in the studies of Dritsakis (2004), Aguilo et al., (2005), Botti et al., (2007), Chaiboonsri et al., (2010), Eita et al., (2011), Kadir et al., (2013), Kum et al. (2015), Thien et al., (2015), and Kaplan and Aktas (2016) as an explanatory variable. This variable is expected to leave a positive relationship with tourism demand. This implies that an increase in tourist's income will stimulate the tourist arrivals in a tourism destination due to higher purchasing power.

On the other hand, transportation cost is another determinant found in tourism demand study. Transportation cost is adopted in the study of Khadaroo and Seetanah (2007), Chaiboonsri et al. (2009), Chaiboonsri et al. (2010), Eryigit et al. (2010), Priego et al. (2015), and Kaplan and Aktas (2016). A negative relationship between the transportation cost and tourism demand is anticipated because higher transportation implies that the travelling cost become higher and it reduces the tourist's utility to travel abroad.

Furthermore, tourism price is also employed in previous studies to identify price impact towards tourism demand. It has been employed in Song and Li (2008), Puah et al. (2014), Lorde et al. (2015), and Dogru et al. (2017)'s study. The empirical findings of their studies show that tourism price and tourism demand are negatively related because some tourists prefer cheaper price for similar tourism products.

3. Data and Method

In this study, an augmented gravity model is employed to investigate the determinants affecting tourism demand in Sarawak. The core gravity model is based on the Newton Law Theory which stated that two objects are attracted by each other under the gravity theory. In this study, the basic form of core gravity model is shown in Equation (1):

$$T_{ijt} = \beta_0 \frac{(GDP_{it}) \times (GDP_{jt})}{Dist_{ijt}} \varepsilon_{ijt} \tag{1}$$

where the symbol *i* refers to the origin country, *j* indicates the destination country, *t* denotes time, β_0 is the constant term, and ε_{ijt} is the error term. In addition, T_{ijt} presents the tourism flow between countries *i* and

j; GDP_i and GDP_j refer to the economic size of the country *i* and *j*, respectively; $Dist_{ijt}$ is the great circle distance between the capitals of country *i* and country *j*.

In this study, an additional variable which is tourism price (*TP*) has been included into the core gravity function to gather extra tourism information in Sarawak. Seetaram et al. (2016) stated that the *TP* is a fundamental requirement in the tourism demand function. This is because *TP* can determine the sensitivity or reaction of tourists towards changes in prices in the destination country, and thus the tourism players can design their desired policies to attract more tourists. The augmented gravity function for Sarawak tourism demand is expressed by the following equation:

$$TD = f(GDP, GDPSWK, TC, TP) \tag{2}$$

where *TD* represents the tourist arrivals for ten major tourist generating countries into Sarawak, *GDP* proxies the income level in origin countries, *GDPSWK* indicates the income level in Sarawak, *TC* is the transportation cost, and lastly *TP* represents the tourism price. For the estimation purposes, Equation (2) is expressed in logarithmic form as shown in Equation (3):

$$LTD_{ijt} = \beta_0 + \beta_1 LGDP_{it} + \beta_2 LGDPSWK_{jt} + \beta_3 LTC_{ijt} + \beta_4 LTP_{ijt} + \varepsilon_{ijt}{}^1 \tag{3}$$

The *LGDP* is expected to has a positive relationship with the *LTD* in Sarawak. This indicates that an increase in tourist income will encourage more tourist to visit Sarawak and vice versa, a decline in tourist income subsequently will reduce the tourist visiting Sarawak. The *LGDP* is proxies by its nominal income.

Additionally, a positive relationship is expected to exist between the *LGDPSWK* and *LTD* in Sarawak. This illustrates that economic performance in Sarawak influences the tourist intention to visit Sarawak. The better economic performance in Sarawak indicates that the government has more capital allocation to further develop tourism spots in Sarawak. The LGDPSWK is proxies by nominal income level in Sarawak.

Meanwhile, *LTC* is expected to leave a negative relationship with *LTD* in Sarawak. Higher transportation cost would increase the total cost of the trip and reduce the visiting tourist to Sarawak. The *LTC* is calculated by deflating crude oil price with the geographical distance between the capital of origin countries and Sarawak.

A negative relationship is expected to exist between the *LTP* and *LTD*. This shows that the rise in tourism price will discourage the tourist visit to Sarawak and vice visa, a decline in tourism price will encourage more tourists to visit Sarawak. The *LTP* is obtained by multiplying the ratio of *CPI* between the origin countries and Sarawak with exchange rate.

The information of international tourist arrivals for ten tourist generating countries in Sarawak was gathered from Ministry of Tourism, Arts, Culture, Youth and Sports Sarawak. Meanwhile, the sources of data for independent variables were obtained from CEIC and Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The data employed in this study comprises a balanced panel of 70 observations from 2010 to 2016. The panel includes 10 origin countries which account approximately 95% of total international arrivals in 2016.

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[1] *LTD* refers to the logarithmic form of tourist arrivals, *LGDP* indicates the logarithmic form of the income level in the origin countries, *LGDPSWK* proxies the logarithmic form of the income level in Sarawak, *LTC* denotes the logarithmic form of transportation cost, and lastly, *LTP* is the logarithmic form of the tourism price.

4. Results

Table 2 presents the summary statistics of Sarawak tourism demand model using a static linear panel data approach. As shown in Table 2, the *F*-test is statistically significant at 1% level, indicating that the data can be pooled together in this study. Next, Breusch-Pagan Langarian Multiplier test is statistically significant at 1% level, indicating that the RE model is a preferable model than POLS model. Then, the null hypothesis for Hausman test does not reject at any significant level, further support that the RE model is a desirable model compared to FE model.

Table 2: Results of Static Linear Panel Data Models for Sarawak
Dependent Variable: LTA

Variable	Pooled OLS	Random Effects	Fixed Effects	Random Effects (Robust Standard Errors)
Constant	-20.67 (30.53)	-51.56*** (7.68)	-48.82*** (7.76)	-20.67** (8.94)
LGDP	-0.51 *** (0.10)	-0.07 (0.11)	0.11 (0.14)	-0.51*** (0.02)
LGDPSWK	2.01 (1.27)	2.96*** (0.39)	2.61*** (0.43)	2.01*** (0.37)
LTC	-0.25 (0.20)	-0.59*** (0.10)	-0.54*** (0.11)	-0.25*** (0.04)
LTP	-0.14*** (0.04)	-0.20** (0.10)	-0.38** (0.17)	-0.14*** (0.01)
F-Test (*p*-value)			29.88*** (0.00)	
Breusch-Pagan LM Test (*p*-value)		194.49*** (0.00)	-	-
Hausman Test (*p*-value)	-		5.48 (0.24)	-
Multicollinearity	-	2.30	-	-
Serial Correlation	-	18.47*** (0.00)	-	-
Observations	70	70	70	70

Notes: Asterisk *** and ** represent 1 and 5 percent levels of significance, respectively. The figures in brackets are t-statistics.

Then, a series of diagnostic tests are conducted to ensure the goodness-of-fit of the model. Table 2 shows that the model does not suffer from multicollinearity problem whereas it is encounters serial correlation problem. However, this issue can be rectified by using panel corrected standard errors. After rectifying this problem, the final RE model is shown in the last column of Table 2.

Surprisingly, the estimated coefficients of *LGDP* was negatively affecting tourism demand in the case of Sarawak which was contradicted to the previous studies. The empirical finding illustrated that the number of tourist arrivals will be decreased by 0.51% when their income level raised by 1%. The negative sign implied that Sarawak might be considered as inferior tourism destination. This finding was in line with Candela and Figini (2012) and Borhan and Arsad (2016) which stated that the income level leaved a

negative impact on the number of tourist arrivals implying that the tourism destination was considered as an inferior good by the tourists, and they preferred to travel to a more luxury destination around the world.

Furthermore, a positive relationship was detected between *LGDPSWK* and tourism demand in Sarawak. This illustrated that the economic performance in Sarawak will affect the tourist's intention to visit Sarawak. The better economic performance indicating that Sarawak has more capitals in developing tourism infrastructures and facilities. A 1% rise in *LGDPSWK* will attract another 2.01% of tourist arrivals into Sarawak.

On the other hand, the *LTC* and *LTP* are negatively affecting tourism demand in Sarawak as expected, and statistically significant at 1% level. This shows that the closer the distance between the countries, the more attractive will be the service on offer. The empirical result shows that 1% increase in *LTC* discourages 0.25% of tourists travel to Sarawak. Also, a 1% rise in *LTP* will reduce 0.14% of tourist arrivals into Sarawak. This is because the rise in *LTC* and *LTP* will increase their cost of travelling which may reduce their utility to visit Sarawak.

5.   Conclusion

This study aims to identify the determinants affecting tourism demand in Sarawak. An augmented gravity model framework to model tourism demand for the Sarawak employing panel data on 10 countries from 2000 through 2016. The determinants in the empirical model including income level in origin countries, income level in Sarawak, transportation cost and tourism price. The empirical model is estimated using a static panel approach.

This study has shown that the determinants were significantly affecting tourism demand in Sarawak. The empirical findings illustrated that the income level was positively affecting tourism demand in Sarawak while transportation cost and tourism price were negatively influenced tourism demand in Sarawak which were consistent with the previous studies.

Contradict to the prior studies showed that income level in origin country always positively affecting tourism demand, but we found income level in origin country was negatively influenced tourism demand in the case of Sarawak. The negative relationship implied that Sarawak might be considered as inferior tourism destination, and they preferred to travel to a more luxury destination around the world. Therefore, the empirical result in this study was contributed to the current literature.

The findings of this study have a number of practical implications. Firstly, the massive promotion and tourism development are essential to ensure its competitiveness and attractiveness. In order to ensure its sustainable growth, the government has to further upgrade its infrastructures and offering more special tourism products to attract more tourist arrivals. With strong promotions and offering more special tourism products, Sarawak tourism can be lifted up to higher level and as a world-top eco-tourism destination. Hence, more tourists will visit to Sarawak instead of travel to other tourism destinations when they have higher income.

Besides that, the Sarawak government has to collaborate closely with airline players to commerce more international direct flights with other countries to reduce travelling cost and time for long haul tourists. Lastly, a proper pricing strategy is important to ensure the Sarawak tourism is market at the competitive price. This is because the tourists are more willing travel to Sarawak when they feel the worthiness of the money spent in Sarawak. Further research investigating on Sarawak tourism demand using different determinants is highly encouraged, so that more useful tourism information can be obtained in order to ensure the tourism sustainable growth in the long-term.

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