Research Article

Tourism demand in Malaysia: A panel data analysis of 17 OECD countries

Journal of Tourism, Hospitality & Culinary Arts (JTHCA)
2020, Vol. 12 (3) pp 52-64

Submit date: 24th August 2020
Accept date: 04th December 2020
Publish date: 28th December 2020

Ravikumar Suppiah
Doris Padmini Selvaratnam
Faculty of Economics and Management
Universiti Kebangsaan Malaysia, MALAYSIA
ukmravikumar@gmail.com

Proposed citation:

Suppiah, R. & Selvaratnam, D.P. (2020). Tourism demand in Malaysia: A panel data analysis of 17 OECD countries. *Journal of Tourism, Hospitality & Culinary Arts, 12*(3), 52-64

Abstract

Tourism is a large contributor to the growth of the Malaysian economy. The natural and built environment, coupled with the diverse local culture, makes Malaysia a unique attraction for foreigners. This paper investigates the main determinants of tourism demand in Malaysia across 17 OECD countries using secondary data and a panel data analysis. Considering the fixed effect (FE) and random effect (RE) models, the Hausman test indicates that the FE model fits the best. This study's relative price is statistically significant with a negative sign, meaning that tourist demand increases when the comparable prices fall; meanwhile, cross-elasticities show substitution effects between Malaysia and alternative destinations. The Visit Malaysia Year campaign in 2014 had positively impacted the tourism demand. The main conclusion drawn is that Malaysian tourism is sensitive to prices. The tourism industry stakeholders need to ensure that tourism services are competitively low through innovative travel packages and offerings. Policymakers may be instrumental in providing a more conducive environment, especially tax exemption and other infrastructure incentives.

Keywords:

Tourism demand; Malaysia; OECD; panel data

1 Introduction

The tourism industry is one of Malaysia's mainstays, contributing to both GDP and employment. The latest Tourism Satellite Account (TSA) for Malaysia (Department of Statistics, Malaysia [DOSM], 2020) estimated the annual gross value added of tourism industries (GVATI) accounted for RM240.2 billion or 15.9% of GDP in 2019 compared to RM220.4 billion or 15.2% in 2018. Between 2015 and 2019, GVATI has increased by 44.8%, equal to the annual average growth of 9.7%. Within the industry, retail trade remains the single largest subsector to contribute to the GVATI with a share of 46.2%, followed by food and beverage with a contribution of 18.0%. Meanwhile, the country-specific tourism services and tourism accommodation contributed to the GVATI with a share of 12.3% and 11.1%, respectively. The remaining percentage to the GVATI were cultural, sport, and recreational (4.7%); passenger transport (3.9%); automotive fuel (2.0%); and travel agencies (1.8%).

The Malaysian tourism industry continues to provide diverse employment opportunities that attract greater labour market participation. In 2019, TSA estimated that the tourism industry directly employed 3.56 million persons or accounted for 23.6% of Malaysia's total employment, which has increased by around 663,000 jobs since 2015. Within tourism services, food and beverage serving services accounted for the largest employment share, approximately 1.24 million jobs, or 34.7% in 2019. Retail trade generated 1.16 million jobs, followed by 598,500 jobs in the country-specific tourism characteristic services and 233,800 jobs in the accommodation services. The employment in the remaining tourism-related service sectors were passenger transport services (177,300 jobs); the cultural, sports, and recreational services (81,200 jobs); the travel agencies and tour operators (40,700 jobs); and the retail sales of automotive fuel (34,700 jobs).

Table 1 shows Malaysia welcomed 26.1 million international tourists in 2019, slightly more than 1% compared to the tourist arrivals recorded in 2018. The recent TSA reported that the top five markets for international tourists in 2019 were Singapore, Indonesia, China, Thailand, and Brunei. Singapore recorded the highest number of international tourists by far, with more than ten million tourists visiting Malaysia in 2019. On the other hand, the Chinese tourist market has overgrown, with an average annual double-digit growth of 16.7% since 2015. The short-haul market, such as ASEAN, has maintained its lead as the largest incoming tourist arrivals in 2019 with Indonesia, registered the highest positive growth of 10.5%, followed by the Philippines at 6.5%. The medium-haul markets that reported a positive increase included India (22.5%), Saudi Arabia (8.2%), Japan (7.6%), China (5.8%), and Australia (4.8%). The long-haul markets registered positive growth in Canada, Germany, the Netherlands, and the United States.

Table 1: Tourist arrivals and tourism receipts in Malaysia, 2010-2018

Year	International tourist arrivals	*Rate of growth (%)*	Receipts (RM million)	*Rate of growth (%)*
2010	24,577,196		63,077.5	
2011	24,714,324	*0.6*	65,342.2	*3.6*
2012	25,032,708	*1.3*	67,070.3	*2.6*
2013	25,715,460	*2.7*	73,369.5	*9.4*
2014	27,437,315	*6.7*	80,075.9	*9.1*
2015	25,721,251	*-6.3*	74,637.6	*-6.8*
2016	26,757,392	*4.0*	81,619.7	*9.4*
2017	25,948,459	*-3.0*	85,730.8	*5.0*
2018	25,832,354	*-0.5*	87,682.4	*2.3*
2019	26,100,784	*1.0*	89,394.7	*2.0*

Overseas tourists visiting Malaysia have provided a source of income in the form of foreign exchange earnings. In 2019, inbound tourists spent a total of RM89.4 billion in Malaysia, which 97.0% of the tourism receipts or RM86.7 billion made by the overnight tourists while received the remaining 3.0% from day visitors. In terms of goods and services, country-specific tourism characteristic goods or shopping remain the highest source of spending revenues among international tourists in 2019 with RM29.7 billion or 33.3%. Accommodation services, including camping grounds and caravan rentals, has generated around RM21.8 billion or 24.2%. The annual expenditures on passenger transport increased by 685.9 million to RM16.5 billion in 2019 due partly to a higher percentage of air travellers from 34.7% in 2018 to 36.8% in 2019. The food and beverage serving services (13.4%); travel agencies and tour operators (4.5%); country-specific tourism characteristic services (3.1%); and cultural, sports and recreational services (2.8%) accounted for the remaining tourist expenditure.

International travel relates to tourists' income, especially when the travelling motive is holidaying or visiting friends and families. A meta-analysis by Crouch (1996) shows that 70% of the income elasticity is above unity or value of 1.0, implying that foreign travel is a luxury product. Thus, wealthy tourists with strong purchasing power from the OECD, particularly from the European continent, are the key source markets for Malaysian inbound tourism.

Table 2: Tourist arrivals from selected OECD markets, 2010 -2018

Rank	Country of origin	9-year total	9-year average	2018	*Annual growth (%)*
1	Australia	4,312,131	479,126	351,500	*-5.4*
2	Japan	4,023,699	447,078	394,540	*-0.6*
3	UK	3,616,814	401,868	361,335	*-1.9*
4	South Korea	3,438,759	382,084	616,783	*9.9*
5	USA	2,329,424	258,825	338,089	*4.2*
6	France	1,247,215	138,579	139,408	*2.6*
7	Germany	1,195,942	132,882	128,895	*-0.2*
8	Netherlands	790,144	87,794	81,651	*-3.7*
9	Canada	749,967	83,330	84,705	*-0.9*
10	New Zealand	564,707	62,745	50,698	*-2.9*
11	Italy	427,111	47,457	52,055	*1.1*
12	Sweden	348,530	38,726	32,665	*-4.4*
13	Spain	271,813	30,201	42,267	*7.3*
14	Switzerland	241,027	26,781	25,680	*-0.9*
15	Denmark	217,061	24,118	23,556	*-0.6*
16	Ireland	200,654	22,295	19,687	*-1.8*
17	Norway	169,978	18,886	15,202	*-4.4*
	Total	24,144,976	2,682,775	2,409,234	*0.4*

Table 2 shows that Malaysia welcomed 2.4 million tourists from 17 OECD countries in 2018, accounting for more than 10% of the total number of visitors and contributed nearly 15% of the total tourism receipts. Malaysia is an important tourism destination for tourists from Australia, Japan, South Korea, and the United Kingdom. While South Korea (9.9%), Spain (7.3%), and the United States (4.2%) recorded favourable growth in 2018, the number of visitors in many other countries fell. For example, Australia and New Zealand recorded a shrink rate of 5.4% and 2.9% per year, respectively. The Scandinavian countries also registered negative growth between 0.6% and 4.4%. Most notably, the market share of British and Japanese tourists has fallen in the last nine years. Therefore, it is pertinent to analyze the economic factors that may influence the future's tourism demand.

This study estimates Malaysia's international tourism demand from selected OECD countries from 2010 to 2018 using the static panel data approach. A substantial part of this study will investigate the price and income elasticities. The remainder of this paper is organized as follows. The next section describes the econometric methods and variables applied in tourism research. Section 3 presents the model specification and data used in the analysis. Section 4 details out results from pooled OLS, FE, and RE models, and 5 Section concludes.

2 Literature Review

The time series and panel data are standard econometric techniques within tourism demand modelling in Malaysia. In time series regression, the autoregressive distributed

lag (ARDL), vector autoregressive (VAR) model, and almost ideal demand systems (AIDS) model have emerged as mainstream methodology. However, the ARDL approach to cointegration has outperformed the rest of the models. For example, the ARDL approach to cointegration documented in Beh and Lee (2020) in examining the long-run relationship between tourism and real exchange rates; Puah et al. (2018) in predicting Chinese inbound tourism to Malaysia; and Habibi and Ahmadzadeh (2015) in investigating the long-run relationship among tourism, trade openness, and economic growth. The majority of Malaysia's tourism studies have applied the ARDL model by implementing the Augmented Dickey-Fuller test for unit roots, followed by Johansen and Juselius (1990) or Peseran et al. (2001) cointegration testing. Several studies on tourism have utilized the VAR and AIDS models to investigate causality. The recent VAR model can be found in Tang and Tan (2015). Meanwhile, AIDS is a new model recently applied to tourism demand analysis. The AIDS model underpins depth analysis on elasticity to derive substitution and complementary effects. In Malaysia, Loganatan et al. (2019) recently applied the model to study the impact of macroeconomic factors on international tourism demand and Loganatan et al. (2019) to analyze Malaysia's bilateral tourism demand with Indonesia.

Panel data are modelled by pooling time series and cross-section data. With a larger number of observations, panel data gives more data variation, less collinearity, and more degrees of freedom. According to Baltagi (2013), a more complicated analysis, for example, time variations in cross-section, can be constructed and tested. Most importantly, panel data estimation can control individual-specific heterogeneity. The most widely used panel data models in Malaysian tourism literature are the standard (OLS with fixed effects or random effects) and dynamic panel data models. The standard panel data models are characterized by several assumptions (Wooldridge, 2010). For example, the pooled OLS model assumes that the independent variables are strictly exogenous; the intercept and slope coefficients are constant across time and unit.

On the other hand, the FE model assumes that the heterogeneity or individual-specific effects vary across units but not overtime. The time fixed-effects model assumes individual-specific effects change over time but not across units. In the RE model, individual-specific effects are random and uncorrelated with independent variables.

The standard panel data models were employed in Kusni et al. (2013) to investigate the tourism demand of OECD tourists to Malaysia. The Hausman test is favourable to the RE model in their study, and tourism demand was sensitive to Malaysian tourism price changes. Salleh et al. (2010) estimate Middle East tourists' demand and the Hausman test in their study found that the RE model fits the best. Ooi et al. (2013) examined tourism demand by grouping the tourist arrivals by ASEAN and non-ASEAN regions and extended the analysis into a more disaggregated level at the state-level. Their study found that tourism price is statistically significant with negative relationships in both ASEAN and non-ASEAN region with tourist income statistically substantial in the ASEAN region.

The dynamic panel data models, including the generalized method of moments (GMM) models, are developed in a lagged dependent variable. These models help address the endogeneity problem across variables, particularly when pooling small time series data in a large cross-sectional array. Several studies on tourism demand in Malaysia have used this method. For example, Habibi (2017) estimated inbound tourism comprising 33 countries to Malaysia using the GMM procedure of Arellano and Bond. This study concluded that the economic determinants such as tourist income and tourism prices and non-economic determinants, namely hotel rooms' availability, habit persistence and political stability were the key attributes of tourism demand. In another example, Habibi and Abbasinejad (2011) investigated the Malaysian inbound tourism demand from 19 European countries by using Arellano and Bond estimators, followed by the Sargan test of over-identifying restrictions and Wald test. One of the key findings was the estimated elasticities obtained for the income variable is less than one, indicating that Malaysian tourism services are considered non-luxury by overseas tourists. The gravity model is also widely used to study tourism flows. However, unlike the other methods above, this model is nonstochastic similar to input-output analysis and social accounting matrices. The gravity model analysis for Malaysian tourism demand was documented in Othman et al. (2018), Ghani (2016), Kosnan et al. (2013), and Hanafiah and Harun (2010).

Most of the econometric analysis of international travel in Malaysia has utilized tourist arrivals as the dependent variable with annual data dominating the literature. Few studies such as Kosnan et al. (2013) and Moorthy (2014) presented tourist receipts as the dependent variable in their research. Tourist arrivals are standard dependent variables since data are readily available. Simultaneously, tourism receipts are difficult to measure because of the nature of tourism services, comprising a broad range of business segments (Sheldon, 1993).

Price and income are essential economic variables in tourism demand studies because tourists are responsive to price and income changes. This is a similar idea to utility and marginal utility along the budget line, where tourists will respond negatively to price change and positive response to the income change. Thus, almost all international tourism demand literature, including in Malaysia, was modelled based on this premise. For example, Hanafiah and Harun (2010) found that both income and price factors influenced Malaysia's inbound tourism demand, positively affecting income and adverse effects on the price. Salleh et al. (2008) provided empirical evidence that a 1% decrease in Malaysia's tourism price will increase approximately 5% to 8% of tourist arrivals from Brunei, China, Hong Kong, Singapore and Thailand. Kadir and Karim (2009) are empirical results showing a 1% increase in Malaysia's tourism price will discourage tourist arrivals from the United Kingdom by 2% and the United States by 0.6%. Habibi et al. (2009) found that Malaysia's international tourism is sensitive to price changes with short-run elasticities at -0.6 and long-run elasticities at -6.67. However, findings on price and income elasticities are subjected to the possibility of contrary results. For example, along with the same study on tourist arrivals from Brunei, China, Hong Kong, Singapore, and Thailand, Salleh et al. (2008) revealed that tourism price was not statistically

significant for tourists from Japan and Australia. One possible reason for such a result is that Malaysia's changes in price do not adversely affect the willingness to pay among the tourists from Japan and Australia.

Consumer price index (CPI) is a reasonable proxy to represent the cost or price of tourism (Martin & Witt, 1987) on the grounds of availability and access (Morley, 1994). It is also justified because tourist spending comprises the broad part of an economy and therefore, weighted prices in the CPI able to proximate the general consumer spending of international tourists (Morley, 1994).

The economic demand theory also suggests that as income increases, more people are likely to travel, and therefore, income is a positive function of tourism demand. This hypothesis has been the dominant factor of analysis by a large number of empirical studies. Ideally, discretionary income is the most appropriate measurement of income (Lim, 1997). However, data on discretionary income are not readily available in practice. Hence, Song and Witt (2000) suggested that real personal disposable income is the nearest substitute while national disposable income, gross national income, and GDP can be a proxy for tourist income for business visits. A closer look into the alternative measures of income in Malaysian tourism demand studies reveals that most researchers employed real GDP or their capita forms. Habibi and Abbasinejad (2011) use real GDP in their dynamic panel data analysis. Salleh et al. (2008) employed real per capita GDP by weighting the CPI. Hanafiah and Harun (2010) used gross national income, and Kusni et al. (2013) generated real personal revenue to estimate tourists' income across selected ASEAN countries. Salleh et al. (2010) investigated the tourism demand from Middle East countries using real per capita income. Their results show that a 10% increase in revenue will generate 3.8% more arrivals to Malaysia. Although most studies have pointed out the importance of the income variable as an important explanatory variable, it has not always been conclusive that the effects of income will be the same for all tourism studies. For example, the income results were insignificant in dynamic panel data models in Habibi et al. (2009). Income variable also tends to be negligible for tourist arrivals from Australia, Brunei, and the United Kingdom in a bound test approach to cointegration analysis estimated by Habibi and Rahim (2009).

The inclusion of substitute prices into the demand function allows researchers to determine the impact of alternative destinations. Neighbouring countries such as Thailand, Singapore, and Indonesia usually treated as alternative destinations, although Habibi (2017) have included China and Hong Kong. The positive and negative signs of coefficient elasticities indicate the substitution and complementary effects between the destination country and its alternative destinations. Thus, not all alternative destinations are known as substitute destinations, as some studies suggest the opposite. For example, Kadir and Karim (2009) found Thailand and the Philippines as the complementary destination while Singapore as the substitute destination. Salleh et al. (2008) examined Singapore, Thailand, and Indonesia as alternative tourism destinations. Their study found that there is a greater tendency for alternative destinations to substitute Malaysia. Habibi (2017) found that China, Indonesia, Singapore, Thailand and Hong Kong are complementary destinations to Malaysia.

Dummy variables examine various unexpected events such as economic crises, epidemics, and natural catastrophes, impacting tourism demand. Furthermore, regional and country-specific events such as significant tourism campaigns and sporting events are often studied—the dummy variables in Malaysian tourism demand models target specific circumstances. For example, Habibi (2017) and Ooi et al. (2013) utilized dummy variable to study the impact of Severe Acute Respiratory (SARS) on Malaysian tourism demand; Norsiah et al. (2008) on the Asian financial crisis in 1997/1998; Kusni et al. (2013) on the 2008-2009 Global Financial Crisis; Salleh et al. (2010) and Habibi (20150 on the terrorist attack in the United States on September 11 in 2001; and Ooi et al. (2013) on the 2004 Indian Ocean earthquake and tsunami and Bali bombings. While many researchers have documented these events' adversity, Hanafiah and Harun (2010) found that the economic crises have increased inbound tourist inflows for intercontinental tourists in their study. In the case of tourism events, the inclusion of dummy variables into regression models has resulted in buoyant tourism demand. In addition to dummy variables, lagged dependent variables are included in the demand function to reflect the effects of repeated visits.

The annual data of tourist arrivals from selected OECD countries to Malaysia between 2010 and 2018 were obtained from the Malaysia Tourism Promotion Board (MTPB). Data on GDP per capita, CPI and exchange rates were obtained from the IMF dataset. Additional data on international visitor arrivals to Singapore and Thailand are obtained from the Singapore Tourism Board and Ministry of Tourism and Sports of Thailand, respectively, to derive each country's substitute prices.

The tourism price in this analysis is measured based on Equation (1):

$$P_{it} = \frac{CPI_{MYSt} / EX_{MYSt}}{CPI_{it} / EX_{it}}, \quad (1)$$

Where CPI_{MYSt} and CPI_{it} are the CPI for Malaysia and origin country i; EX_{MYSt} is exchange rates between Malaysia ringgit and the US dollar, and EX_{it} is exchange rates between the currency of country origin and the US dollar. The Equation (1) is expressed in natural-logarithmic form, therefore, are estimates of relative price elasticities. The estimated price elasticities are almost always negative as the tourism price increases; there will be less travel demand.

This study's income variable refers to the real per capita income (RPI) expressed in Equation (2). High income in the country of origin will encourage more outbound travels, which usually increased total tourist arrivals into Malaysia.

$$RPI_{it} = \frac{GDP_{it}}{Population_{it} * CPI_{it}}, \quad (2)$$

The substitute prices of alternative destinations are expressed based on Equation (3) and (4). Singapore and Thailand are the alternative destinations for Malaysia.

$$P_{st} = \sum_{j=1}^{2} \frac{CPI_{jt}}{EX_{jt}} w_{ijt} , \quad (3)$$

where j = 1 and 2 represent the substitute destinations; and wijt is the share of international tourist arrivals to country j and calculated from the Equation (4):

$$w_{ijt} = TA_{ijt} / \sum_{j=1}^{2} TA_{ijt} \quad (4)$$

where TAijt is the tourist arrivals to substitute destination j from the origin country i at the time t.

This study will analyze the inbound tourism demand from 17 OECD countries based on Malaysia's significant tourist arrivals and the availability of country-specific data provided by the MTPB.

The linear demand function takes the following form in Equation (5):

$$TA_{it} = f(P_{it}, RPI_{it}, P_{st1}, P_{st2}, DUM) \quad (5)$$

Equation (5) is then written in the following regression form with natural-logarithmic specification in the Equation (6):

$$\ln TA_{it} = \beta_0 + \beta_1 \ln P_{it} + \beta_2 \ln RPI_{it} + \beta_3 \ln P_{st1} + \beta_4 \ln P_{st2} + \beta_5 DUM + \alpha_i + u_{it} \quad (6)$$

where;

TA_{it}	=	number of total tourists arriving to Malaysia from country *i* during year *t*, represents the tourism demand;
P_{it}	=	tourism price in Malaysia;
RPI_{it}	=	real per capita income at purchasing power parity in each of the country *i*;
P_{st1}	=	tourism price in Singapore;
P_{st2}	=	tourism price in Thailand;
DUM	=	dummy variable to capture the effects of Visit Malaysia Year, taking the value of 1if observation in 2014, and is 0 otherwise; and
α_i	=	the fixed effect
u_{it}	=	the error terms

Panel data models describe individual-specific across time and units. The pooled OLS model assumes no country-specific effects, while the FE model allows for country-specific results by allowing each country to have its intercept values. The RE model assumes that country-specific effects are randomly distributed.

3 Findings

Table 3 presents the results of the pooled OLS, FE, RE models, and estimated generalized least square (EGLS) model for investigating the tourism demand from OECD countries to Malaysia. The redundant fixed effects test finds that the FE is appropriate when tested between pooled OLS and FE. Furthermore, the Hausman test rejects the RE in favour of the FE model. A likelihood ratio test for heteroscedasticity detects the presence of group-wise heteroscedasticity, and therefore, the robustness of the FE is fitted with EGLS.

Table 3: Estimates of tourism demand by tourist arrivals from 17 OECD Countries

Variable	Pooled OLS	FE	RE	FE Robust Model (EGLS)
β_0 Constant	11.63861		10.1029	
	(0.629468)		(1.063579)	
	-0.009290	-0.606704**	0.002297	-0.325129*
β_1 Tourism price in Malaysia	(0.013549)	(0.185945)	(0.037286)	(0.157960)
	-0.374161**	0.268876	0.005418	0.129427
β_2 Income	(0.079152)	(0.212327)	(0.159825)	(0.158161)
	0.673365**	0.232563**	0.511054**	0.192370**
β_3 Tourism price in Singapore	(0.041963)	(0.077028)	(0.054875)	(0.070279)
	0.273458**	0.302931**	0.301347**	0.304330**
β_4 Tourism price in Thailand	(0.055490)	(0.052273)	(0.049547)	(0.038023)
β_5 Visit Malaysia 2014	0.256594**	0.195588***	0.231135**	0.155004**
(Dummy)	(0.075660)	(0.035343)	(0.033893)	(0.026056)
R^2	0.935671	0.989985	0.604836	0.994152
R^2-adjusted	0.935671	0.988379	0.591395	0.993214
Redundant test		Reject H_o		
Hausman test			Reject H_o	
Durbin-Watson	0.248986	1.176940	0.936696	1.476407

*Note: Standard errors in parenthesis; statistical significance: *<0.05, **<0.01.*

As all results (except β5) reported in natural-logarithmic form, the coefficients are estimates of elasticities. As expected, the relative price variable's coefficients under the FE model are statistically significant at 5%, with a negative sign. This means that OECD tourists choose Malaysia as the tourism destination based on its relative price, or a 1%

decrease in the price leads to a 0.3% increase in the tourist arrival. The substitute price coefficients for Singapore and Thailand are positive and significant irrespective of the model specification. In other words, a 1% increase in the relative price in Singapore will increase tourist arrivals from the OECD countries into Malaysia by 0.2%.

In comparison, a 1% increase in the relative price in Thailand will increase tourist arrivals from the OECD countries into Malaysia by 0.3%. The significance of Singapore as the substitute tourism destination for Malaysia supports earlier findings by Kusni et al. (2013), Kadir and Karim (2009), and Salleh et al. (2008). However, Kadir and Karim (2009) reported otherwise for the tourism price in Thailand. The Visit Malaysia 2014 dummy variable's estimated coefficient showed a positive sign and was statistically significant at the 1% level; however, the income variable is insignificant. This is consistent with previous studies by Kusni et al. (2013) for the OECD countries, Habibi and Rahim (2009 for tourists from Australia, Brunei, and the UK, Ooi et al. (2013) for non-ASEAN counterparts. One possible reason for this is that the OECD countries represent wealthy clientele with strong appeal for luxury tourism with income per capita among the world's highest. Therefore, their income will not influence Malaysia's tourism products that appeared to be inelastic or non-luxury.

4 Conclusion

In this study, panel data models have been constructed to explain Malaysia's tourism demand from 17 OECD countries. The main conclusion that can be drawn is that Malaysian tourism is sensitive to prices. The estimated values for the own-price elasticity in the selected model is -0.32, or in other words, a 1% increase in the price leads to a 0.3% decrease in demand. Thus, tourism suppliers must be vigilant to maintain price competitiveness. It is also clear that the substitute price coefficients for Singapore and Thailand are positive in all models across the empirical results, implying the substitution effect between Malaysia and alternative destinations. Thus, the Malaysian tourism price and services must be perceived as more attractive than competitors. The Malaysian tourism industry needs to strengthen the resilience of post-COVID-19 tourism so that benefits are maximized, and adverse impacts of the economic calamity and uncertainties are minimized.

Policymakers should be focused on the COVID-19 mitigation efforts through policies, tax exemption and other infrastructure incentives, including stimulus packages, to ensure the tourism industry's sustainability. Finally, the inclusion of a dummy variable in this study found that the Visit Malaysia Year 2014 tourism campaign is statistically significant and positively correlated in all models. In view that tourism campaigns encourage demand, tourism stakeholders may turn to domestic tourism campaigns during the COVID-19 to offset international arrivals' fall. Future research can be extended to determine the economic impact of COVID-19 on Malaysian tourism demand. The tourism industry is directly affected by the current COVID-19 crisis with a dramatic decrease in international tourist arrivals and hotel occupancy rates and an increase in layoffs and foreclosures. Hence, it is expected that future panel data studies

will provide useful insights into how COVID-19 has affected international tourism demand.

5 References

Baltagi, B. (2013). *Econometric analysis of panel data*. (5th ed.). John Wiley & Sons.

Beh, W. L., & Lee, J. H. (2020). The Study of the Malaysia's Tourism Arrivals: An ARDL Approach. *Austrian Journal of Statistics*, *49*(3), 48-56.

Crouch, G. I. (1996). Demand elasticities in international marketing: A meta-analytical application to tourism. *Journal of Business Research*, *36*(2), 117-136.

Department of Statistics, Malaysia (2020). Tourism Satellite Account 2019. https://newss.statistics.gov.my/newss-portalx/ep/epLogin.seam

Ghani, G. M. (2016). Tourist arrivals to Malaysia from Muslim countries. *Tourism Management Perspectives, 20*, 1-9.

International Monetary Fund. (2020). *International Financial Statistics*. [Data set]. https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b

Habibi, F., & Abbasianejad, H. (2011). Dynamic panel data analysis of European tourism demand in Malaysia. *Iranian Economic Review*, *15*(29), 27-41.

Habibi, F., & Ahmadzadeh, K. (2015). Tourism development, trade openness and economic growth: The case of Malaysia. *European Journal of Economics, Finance and Administrative Sciences*, 78, 129-139.

Habibi, F. (2017). The determinants of inbound tourism to Malaysia: A panel data analysis. *Current Issues in Tourism, 20*(9), 909-930.

Habibi, F., & Rahim, K. A. (2009). A bound test approach to cointegration of tourism demand. *American Journal of Applied Sciences*, *6*(11), 1924.

Habibi, F., Rahim, K. A., Ramchandran, S., & Chin, L. (2009). Dynamic model for international tourism demand for Malaysia: Panel data evidence. *International Research Journal of Finance and Economics*, *33*(1), 208-217.

Hanafiah, M. H. M., & Harun, M. F. M. (2010). Tourism demand in Malaysia: A cross-sectional pool time-series analysis. *International Journal of Trade, Economics and Finance*, *1*(1), 80-83.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169-210.

Kadir, N., & Abd Karim, M. Z. (2009). Demand for tourism in Malaysia by UK and US tourists: A cointegration and error correction model approach. In Advances in tourism economics (pp. 51-70). Physica-Verlag HD.

Kosnan, S. S. A., Ismail, N. W., & Kaliappan, S. R. (2013). Determinants of international tourism in Malaysia: Evidence from gravity model. *Jurnal Ekonomi Malaysia*, *47*(1), 131-138.

Kusni, A., Kadir, N., & Nayan, S. (2013). International tourism demand in Malaysia by tourists from OECD countries: A panel data econometric analysis. *Procedia Economics and Finance*, 7, 28-34.

Lim, C. (1997). Review of international tourism demand models. *Annals of Tourism Research*, *24*(4), 835-849.

Loganatan, N., Ahmad, N., Mursitama, T. N., Taha, R., Mardani, A., & Streimikiene, D. (2019). The effects of exchange rate, price competitiveness indices and taxation on international tourism demand in Malaysia. *Economics and Sociology*, *12*(3), 86-97.

Malaysia Tourism Promotion Board. (n.d). *Malaysia Tourism Key Performance Indicators 2018*. http://mytourismdata.tourism.gov.my/wp-content/uploads/2019/10/KEY-PERFORMANCE-INDICATORS-2018-PDF.pdf

Martin, C. A., & Witt, S. F. (1987). Tourism demand forecasting models: Choice of appropriate variable to represent tourists' cost of living. *Tourism Management*, *8*(3), 233-246.

Ministry of Tourism and Sports, Thailand. (2020). [Data set]. https://www.mots.go.th/mots_en/more_news_new.php?cid=330&page=2

Moorthy, R. (2014). An empirical analysis of demand factors for Malaysian tourism sector using stochastic methods. *Review of Integrative Business and Economics Research*, *3*(2), 255.

Morley, C. L. (1994). The use of CPI for tourism prices in demand modelling. *Tourism Management*, *15*(5), 342-346.

Ooi, C. A., Hooy, C. W., & Mat Som, A. P. (2013). Tourism crises and state level tourism demand in Malaysia. *International Journal of Business and Society*, *14*(3).

Pesaran, M. H., Shin, Y., & Smith, R. J. 2001. Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289-326.

Puah, C. H., Huan, S. H., & Thien, F. T. (2018). Determinants of Chinese demand for tourism in Malaysia. *Business and Economic Horizons*, *14*(3), 501-512.

Salleh, N. H. M., Siong-Hook, L., Ramachandran, S., Shuib, A., & Noor, Z. M. (2008). Asian tourism demand for Malaysia: A bound test approach. *Contemporary Management Research*, *4*(4).

Salleh, N. H. M., Othman, R., & Ramachandran, S. (2007). Malaysia's tourism demand from selected countries: The ARDL approach to cointegration. *International Journal of Economics and Management*, *1*(3), 345-363.

Salleh, N. H. M., Othman, R., Noor, A. H. S. M., & Hasim, M. S. (2010). Malaysian tourism demand from the Middle East market: A preliminary analysis. *International Journal of West Asian Studies*, *2*(1).

Salleh, N. H. M., Zaleha, A. S. S. H. L., Noor, M., & Ramachandran, S. (2007). An ARDL model of tourism demand for Malaysia by major ASEAN countries. *International Journal of Economics, Management and Accounting*, *15*(1), 1-26.

Sheldon, P. J. (1993). Forecasting tourism: Expenditures versus arrivals. *Journal of Travel Research*, *32*(1), 13-20.

Singapore Tourism Board. (2020). *Singapore Tourism Analytics Network*. [Data set]. https://stan.stb.gov.sg/portal/tourism-statistics.html

Song, H., & Li, G. (2008). Tourism demand modelling and forecasting—A review of recent research. *Tourism Management*, *29*(2), 203-220.

Song, H., & Witt, S. F. (2000). Tourism demand modelling and forecasting: Modern econometric approaches. Routledge.

Tang, C. F., & Tan, E. C. (2015). Does tourism effectively stimulate Malaysia's economic growth? *Tourism Management*, 46, 158-163.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. (2nd ed.). MIT press.