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INTERNATIONAL DEMAND FOR MEDICAL TOURISM IN MALAYSIA: EVIDENCE FROM PANEL DATA

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ABSTRACT

The present paper attempts to investigate the significance influence of some selected economic variables on the international demand for medical tourism in Malaysia by utilizing Pooled Mean Group (PMG)/Autoregressive Distributed Lag (ARDL) model based on panel data set of ASEAN-4 countries spanning from 2001 to 2017. Findings of the study indicate that the price of medical tourism, travelling cost, real per capita income, exchange rate and health expenditure are statistically significant in influencing international demand for medical tourism in Malaysia for both long run and short run. Moreover, price of tourism in the substitute destination (Indonesia) and inflation are also statistically significant in determining international demand for medical tourism in Malaysia in the short run. The findings are in line with the economic theory. Therefore, to attract more international medical tourists, Malaysia needs to maintain it price competitiveness relative to other substitute destinations in the region, reduce the transport cost as well as improve the quality of medical services provided. Besides, private operators and market participants should influence necessary changes in medical tourism framework to ensure that services are effective and efficient. Ultimately, market players in medical tourism sector should practice Sustainable Responsible Investment (SRI) with aim to stabilize between medical tourism development and social responsibility.

Keywords: Macroeconomic variables; medical tourism; Pooled Mean Group, SRI

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1. INTRODUCTION

Presently, medical tourism has been gaining popularity as one of the crucial sectors towards sustainable economic growth and development. Over the past year, the activities of medical tourism have been increased and attracted the attention of healthcare consumers, facilitators, providers, and scholars from various disciplines (Sobo, 2009). The business of medical tourism has been a major source of external reserves to the destination countries. Hence, this business has attracted governments around the world to participate actively in developing the local medical tourism sector (Johnston et al., 2015). The global medical tourism market size accounted for $102.60 billion in 2019 and is projected to reach $272.70 billion by 2027 (Zion Market Research, 2021). According to the Malaysia Healthcare Travel Council, medical tourism industry in

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Malaysia generated RM1.5 billion in revenue receipts from more than 1.2 million medical tourist arrivals in 2018 (MHTC, 2020).

Medical tourism is not a new phenomenon. Even in ancient times, people traveled to other countries for health-related purposes (Bookman & Bookman, 2007). The ancient Greeks and Egyptians for instance, went to hot springs and baths to improve the health. Medical tourism is also perceived as health travel, medical travel, or health tourism. It should equally be noted that medical tourism can be both domestic and international.

There are different definitions of medical tourism as some authors view it from supply side (Goodrich & Goodrich, 1987; MacReady, 2007), while other authors view from the demand side of it (see among others, Pagan & Horsfall, 2020; Haque et al., 2018; Heung et al., 2010; Johnston et al., 2010).

An early definition of medical tourism was provided by Goodrich and Goodrich (1987) who perceived medical tourism as an intentional attempt by country to attract tourist by deliberately marketing its health-care services and facilities as well as its regular tourist amenities. On the other hand, Heung et al. (2010) and Johnston et al. (2010) stressed that medical tourism as a vacation that involves travelling across international borders to get a wide range of medical services. In most cases it involves social activities, as well as health-care services. The former definition is more on the supply side while the latter is more on the demand aspect of the medical tourism activity.

Demand for international medical tourism has been raising due to the perceived availability of good and affordable medical care services in the medical tourism destinations without distinctions of the economic status among the countries as developing economies, emerging markets or developed countries. As stated by MacReady (2007), developing countries such as Thailand tend to attract medical tourist due to low cost of living which invariably affects costs of medical care than almost everywhere in Europe and North America.

Medical tourism has been receiving great attention from the destination countries where it is seen as a vehicle for rapid economic growth (Tang & Abdullah, 2018). It impacts not only in medical expenditure but also on non-medical expenditure (Connell, 2013b; Klijs et al., 2016). Medical tourism can go a long way in expanding the Gross Domestic Product (GDP), drive more foreign exchange earnings and create a favorable balance of trade of the supplying countries and creating employment (see *inter alios*, Connell, 2013a; Ramírez de Arellano, 2007; Mahjom et al., 2011).

Meanwhile, Smith et.al. (2011) emphasized that the benefits of medical tourism are not restricted to generating of foreign exchange earnings but also reducing and/or reversing brain drain amongst the medical professionals of exporting countries as well as alleviating waiting lists and improving the health-being of the citizens of the importing countries. On the contrary, the medical tourism has it disadvantages to both the exporting and the importing countries. The exporting countries might end up with dual medical systems, where the local population might be disadvantaged in crowded medical system while the importing countries may be exposed to low quality of care and legal liabilities (Smith et al., 2011). The foreign medical tourists might face legal challenges related to treatments received which may include the lack of legal remedies for malpractices (York, 2008).

Presently, the Asian medical tourism is expanding as some countries such as Singapore, South Korea, India, Malaysia, and Thailand received over one million medical tourist per year from all over the world (Alberti et al., 2014). As stated in Gan and Frederick (2011) the Asian countries such as India, Malaysia, Singapore, and Thailand provide medical services that were in the past only obtainable in Europe and North America. Besides, Dawn and Pal (2011) stressed that the countries such as India, Malaysia and Thailand are aggressively promoting their medical tourism. The trend started after the late 1990s Asian financial crisis that engulfed most of Asian countries. Hence, Asian countries are expanding their medical tourism markets with India in forefront whose market share is being scrambled by Malaysia, Singapore, and Thailand (Chinai & Goswami, 2007).

Over the last decade, Malaysia has grown as one of the top destinations for medical tourism in the world. Winning multiple international awards in a wide range of medical specialties, Malaysia offers world-class quality healthcare to patients from around the world, with the benefit of competitive affordability and high accessibility. Medical or Health tourism in Malaysia is managed by the Ministry of Health (MOH) with the vision to develop Malaysia into a preferred destination of world class health services. In order, to promote medical tourism in Malaysia, the Malaysia Healthcare Travel Council (MHTC) was launched as a formal entity within the MOH on the 3rd of July 2009. The main objective MHTC is to assist health travelers in their healthcare journeys in Malaysia. Besides, MHTC works to streamline industry players and service providers in facilitating and growing Malaysia's healthcare travel industry under the brand "Malaysia Healthcare" with the intended goal of making Malaysia the leading global medical tourism destination.

Malaysia's medical tourism has been growing between 16% and 17% year-on-year over the last five years, outperforming the global industry's average growth of between 10% and 12%. According to MHTC (2020), Malaysia recorded nearly RM1.7 billion in hospital receipts from 1.3 million medical tourists in 2019 as compared to RM1.5 billion from 1.2 million medical tourists in 2018. Among the top countries that seek medical treatment in Malaysia are the United Kingdom, Australia, Japan, India, China, Indonesia, and the Middle East region.

Malaysian medical tourism sector offers specialties in various medical disciplines and conducts some of the most complicated treatments worldwide. Nowadays, the medical care in Malaysia on par with the best in the world, where innovation and international expertise are essential. The areas that Malaysian hospitals excel are cardiology, oncology, fertility, orthopedics, and cosmetic surgery. MHTC's aim is to position Malaysia as Asian hub for fertility and cardiology, as well as the leading global destination for healthcare travel. Hence, this boosts the growth of the medical tourism market in Malaysia.

Malaysia had been voted by International Living magazine's Annual Global Retirement Index as the "Best Country in the World for Healthcare" in 2015, 2016, 2017 and 2019 – ahead of France, Thailand, Ecuador, Mexico and Costa Rica. Such a gold standard in the healthcare sector also pushed the country to be ranked as the world's fifth-best places to retire in 2019 by International Living. The factors that contribute to making Malaysia a center of medical excellence in the region are safety and politically stable country, wide choice of world class infrastructure facilities, competitive and affordable pricing, highly qualified, experienced, and skilled consultants with internationally recognized qualifications as well as tolerant multi-cultural and

multi-racial Malaysia society which accommodates patients of different cultures and religions (Chandran et al., 2017; Sarwar, 2013; Musa et al., 2012).

Based on the premise that medical tourism industry can play an influential role in accelerating the growth and development of the national economy, the Malaysian Government in recent years has intensified it promotional activities towards enhancing the level of international medical tourist flow into a country. Whereas it is generally recognized that the level of international medical tourist flow into a particular country change through time, what are the major contributing factors towards such a phenomenon?

In line with the current policy of the Malaysian government to promote international medical tourism, the present paper attempts to examine the significant importance of some economic variables in influencing inbound medical tourists from ASEAN-4 countries namely Singapore, Thailand, Indonesia, and the Philippines to Malaysia by utilizing Pooled Mean Group (PMG)/Autoregressive Distributed Lag (ARDL) model.

The remainder of this paper is structured as follows: The paper begins in Section 2, by reviewing the previous empirical work related to the international demand for medical tourism. Followed by Section 3, explaining the data as well as sketching the methodology to be employed. Our empirical results are presented and discussed in Section 4. The paper is then concluded in Section 5.

2. LITERATURE REVIEW

In contemporary, the issues of international medical tourism have become the concern of many parties – policy makers and researchers in particular. Altogether, studies in the medical tourism are still in its infancy stage and many of its components are left unexplored (Alberti et al., 2014).

There are quite few numbers of models developed in the previous study, that explain the determinants of international demand for medical tourism. A notable amongst these models is the two-stage model propounded by Smith and Forgione (2007) which termed as 'medical tourism decision model' that explain reasons motivating choice of health facility and country. They classified the factors into country specific and medical facility. The former factors are the determinants of choice of international country location which include the economic and political factors as well as the regulatory standards. However, the latter classification deals with factors affecting the choice of the international medical facility which involves factors of costs, Physician's training, accreditation of the medical center and quality of the healthcare provided.

Heung et al. (2010) proposed a broader model which categorized the factors into three major determinants based on factors related to selection of country, hospital, and medical doctor/physician. The country selection criteria include economic condition, political stability, regulatory standards, attribution, distance, and airfare. Besides, the hospital factors include costs, accreditation, reputations, and physicians' training. Furthermore, the selection of doctor/physician is based on recommendations as well as the personal special expertise and reputation of the doctor.

Tang and Lau (2017) in modelling the demand for inbound medical tourism in Malaysia revealed that income, price, exchange rate and medical quality are among the variables that significantly affect long-run demand for medical tourism in Malaysia. Chandran et al. (2017) on the other hand, stressed that Malaysia is a preferred destination for medical tourism because of the cost differences Malaysia's handling of the Asian financial crisis proved compared to other countries in the region. Besides, price competitiveness relative to Singapore is a key factor that influences medical tourists to choose Malaysia instead of Singapore for healthcare treatment.

Further, Awang et al. (2015) in evaluating the model for medical tourism in Malaysia justified that human capital and physical infrastructure are the main determinants for medical tourism demand in Malaysia. Meanwhile, Chandran et al. (2018) stated that strong government initiatives, effective public-private partnerships, aggressive hospitals' marketing efforts and continuous media expose are the key drivers that successfully propelled the medical tourism industry in Malaysia. However, Sarwar (2013) stressed that destination competitiveness and service quality also play an important role in determining the demand for medical tourism.

According to Yusof and Rosnan (2020), to attract more medical tourists, Malaysia needs to improve its services such as smooth immigration procedures, improved tourism spots, and enhanced personal touch to the patients. On the other hand, Haque et al. (2018), claimed that cost, service quality and motivation are the main factors that determine the demand for medical tourism in Malaysia. Besides, Afthanorhan et al. (2018), stressed that medical price and staff skill had positive significant effects on patient loyalty for the destination of medical tourism.

John (2017) in analyzing the usage of social media for marketing and promotion of medical tourism in four medical tourism destination in Asia (Thailand, Singapore, India, and Malaysia) revealed that most of the medical tourism providers in these countries are not fully utilizing the potential of social media for tourism marketing. Therefore, to generate a positive destination image among medical tourists and to ensure sustainable growth in this sector, medical tourism marketers should initiate more interactive forms of communication and promotion through social media and other online marketing platforms.

Pagan and Horsfall (2020) in determining the sustainability of the medical tourism model in Spain and The Costa del Sol stated that the high-quality medical tourism services, tourism facilities and extremely competitive prices as well as high commitment and support of public local authorities, and health providers are among the main determinants of sustainability of medical tourism in these regions. Nonetheless, Mosammam et al. (2019), highlighted that resource endowment is the main determinant of health tourism competitiveness in Iran. Besides, Dang et al. (2020), claimed that tourism sources and medical infrastructures play a crucial role in promoting medical tourism industry in Asia-Pacific region.

Further, in analysing the factors motivating the demand of Mainland Chinese medical tourists for Hong Kong medical healthcare, Ye et al. (2011) stated that the tourists engage in the medical trip to Hong Kong because of the China's 'one child' policy and to obtain Hong Kong permanent residential status. Besides, the Hong Kong's medical procedure, convenience for traveling overseas as well as education and living environment are also the factors that causes tourists to engage in the medical trips.

Moreover, Johnston et al. (2011) in their study on Canadian patients' involvement in medical tourism revealed that financial barriers is one of the main determinants for medical tourism demand. However, Connell (2013a) argued that patients from more developed countries travelling for medical care to less developed destinations for a combination of factors such as prices, variety services and quality as well as accessibility.

In a comprehensive review pertaining to medical tourism, Hopkins et al. (2010) stresssed that medical tourism is driven by push-factors of the origin countries. These factors are related to high cost of healthcare, prolonged waiting period as well as inaccessibility of local medical facilities drive medical tourist from United States (US), Canada and West Europe to seek care in Asia and Latin America.

Ormond and Sulianti (2014) in their study of Indonesian medical tourists seeking medical treatments in Malaysia revealed that both push-factors and pull-factors are responsible for the demand for medical tourism abroad. The push-factors are those related to service availability, accessibility, and the perceived inferior quality of Indonesian medical services, while the pull-factors are the Malaysian cheap costs of medical care and perceived superior medical services that are usually facilitated through temporary or visa-free inter-regional movements.

Besides, Cameron et al. (2014) in investigating the international medical tourism demand by Canadian tourists found that discontentment with the Canadian health-care system, long waiting list as well as the sense of entitlement to best foreign healthcare options are among the factors that motivating them to seek for foreign medical services. On the other hand, Reddy et al. (2010) in their study initiated that the reasons why medical tourism is getting full acceptance is affordability factor.

Hanefeld et al. (2014) however, argued that the medical tourist motivation for foreign medical care is complex. The motivating factors are beyond cost but include availability and distance. Nonetheless, Yu and Ko (2012) advocated that medical tourism enables medical tourists to access foreign medical services conveniently and quickly at reduced costs and in most cases, they obtain a better quality than they could obtain in their home countries. The findings also revealed that medical tourists from Japan, Korea and China were motivated by the pull-factors of the destination country.

Mugerauer (2006) on the other hand, highlighted that the medical procedures sought by tourists from developed countries are the same, especially the medical personnel were trained in or by the origin countries. Besides, Wongkit and McKercher (2015) emphasized that quality consideration is key regardless of the medical services sought as well as limited medical insurance coverage of certain medical services in the countries of origin. Nevertheless, depending on the kind of the healthcare sought and other factors that matter such as price, privacy, as well as shorter waiting period.

Dawn and Pal (2011) proposed that the determinants of demand for medical tourism in India, include quality medical services at affordable cost, expertise in organ transplant and cardiovascular procedures. In addition, Gan and Frederick (2015) revealed that risks, social-related factors and vacation are among the reasons American medical tourists' seek for international medical services.

Zailani et al. (2016) in their study on the effects of medical doctors and hospital's role on Muslim tourists' satisfaction, revealed that Malaysian Islamic friendly hospitals have boosting medical tourism sector in this country. On the other hand, Crooks et al. (2011) emphasized on the role of marketing effort of the destination countries have attracting more medical tourists. Besides, Cohen (2010) stressed that there are scenarios where health insurance companies encourage their clients to seek for foreign medical services. In addition, Vijaya (2010) stated that cost saving to medical tourists or revenue generation are potentials to the host countries.

Most of the previous studies applied survey analysis to examine the development of medical tourism (see among other, Cameron et al., 2014; Johnston et al. 2011; Ormond & Sulianti, 2014; Sarwar, 2013; Reddy et al., 2010; Ye et al., 2011; Yu & Ko, 2012). Only a limited study using econometric analysis to investigate the performance of medical tourism sector especially in the developing countries and emerging markets such as India, Singapore, Thailand, and Malaysia (e.g., Beladi et al., 2019; Tang & Lau, 2017). Besides, most of the relatively limited econometric studies on medical tourism have focused only on the price of medical tourism in the destination country. To the best of authors' knowledge, non-empirical study focusing on the price of medical tourism in the substitute destinations. Therefore, this study attempt to fill this research gap by including the price of medical tourism in the substitute destinations such as Thailand and Indonesia, in examining international demand for medical tourism in Malaysia.

3. METHODOLOGY

The study attempts to investigate the significance influence of some selected economic variables on international demand for medical tourism in Malaysia by utilizing Pooled Mean Group (PMG)/Autoregressive Distributed Lag (ARDL) model based on balanced panel data set of ASEAN-4 countries (Singapore, Thailand, Indonesia, and the Philippines) ranging from 2001 to 2017. The data used in this study were obtained from *Malaysia healthcare Travel Council (MHTC)*, Malaysian Tourism Promotion Board (Planning and Research Division), *Malaysia Profile of Tourists by Selected Markets* (2020), *Malaysia Tourism Key Performance Indicator* (2020), and the World Development Indicators.

Data on international demand for medical tourism (dependent variable) is proxy by number of medical tourist arrivals. This has been used in the previous studies. The independent variables for this study are prices of medical tourism in Malaysia, prices of tourism in the substitute destinations (Thailand and Indonesia), income, exchange rates, traveling cost, inflation and per capita health expenditure.

The study defines prices of medical tourism as the expenses on medical demand by tourists at the destination country. This is calculated based on the consumer price index (CPI) of the destination country divided by the CPI of the country of origin. It is therefore the ratio of the cost of living in Malaysia in relation to other four Asian countries. Furthermore, price of tourism in the substitute destinations is measured as CPI of the alternative destination divided by CPI of the origin country (Song et al., 2003). The alternative countries in this study, are Thailand and Indonesia. Travelling cost is measured by price of crude oil (Garín Muñoz, 2007). Income is measured as real income per capita of the origin country (Dritsakis, 2004; Garín Muñoz, 2007). The exchange

rate variable in this study is the ratio of currency between the receiving country and the country of origin. While inflation is measured as the ratio of inflation between the receiving country and the country of origin. Furthermore, health expenditure per capita is measured as the ratio of per capita health expenditure between the destination country and the country of origin.

It is anticipated that the prices of medical tourism will be negatively related to the demand for international medical tourism. For the substitute medical tourism destination, the relationship can be positive or negative. A positive relationship shows that the country is a substitute destination for Malaysia, while a negative relationship indicates that the country is a complementary destination to Malaysia. Travelling cost is expected to be negatively related to demand for international medical tourism. Income is expected to be positively related to demand for international medical tourism. Any appreciation in tourist country's currency will encourage people to travel abroad. Inflation is expected to be negatively related to the demand for international medical tourism. However, health expenditure per capita is expected to be positively related to demand for international medical tourism in the destination country.

3.1. Model Specification

To achieve the objective of this study, the following model is utilized. The econometric model indicates the relationship between the macroeconomic factors and international demand for medical tourism.

$$LTD_{it} = \alpha_0 + \alpha_1 LTP_{ijt} + \alpha_2 LSPThai_{it} + \alpha_3 LSPIndo_{it} + \alpha_4 LTC_{ijt} + \alpha_5 LRPI_{it} + \alpha_6 LER_{ijt} + \alpha_6 LINF_{ijt} + \alpha_7 LHEPK_{ijt} + \varepsilon_t \quad (1)$$

where LTD_{it} is the natural logarithm of the number of medical tourist arrivals to Malaysia in year t from the country of origin i (ASEAN countries); LTP_{ijt} is the logarithm of medical tourism price in Malaysia for tourist from individual country i in year t; $LSPThai_{it}$, and $LSPIndo_{it}$ are the logarithms of medical tourism price in the substitute destinations (Thailand and Indonesia respectively) for tourists from country of origin i in year t; LTC_{ijt} is the logarithm of travelling cost from the country of origin i to Malaysia in year t; $LRPI_{it}$ is the logarithm of real per capita income of individual country i in year t; LER_{ijt} is the logarithm of exchange rate between the individual country i and Malaysia in year t; $LINF_{ijt}$ is the logarithm of inflation rate between the individual country i and Malaysia in year t; $LHEPK_{ijt}$ is the logarithm of health expenditure per capita between the individual country i and Malaysia in year t while εt is the error term.

3.2. Econometric Techniques

The study utilized the panel Autoregressive Distributed Lag (ARDL) cointegration framework. Furthermore, the framework is employed to simultaneously estimate the long-run and short-run relationships in international medical tourism demand for Malaysia. It also allow to test for the existence of relationship between variables irrespective of whether the underlying regressors are purely I(*1*), I(*0*) or a mixture of the two vectors. The unrestricted ARDL model specification is depicted in Equation 2.

$$x_{it} = \sum_{j=1}^{p} \beta_{ij}\, x_{i,t-j} + \sum_{j=1}^{q} \alpha_{ij}^{'}\, y_{i,t-j} + \mu_i + \varepsilon_{it} \quad (2)$$

where x_{it} is the dependent variable, $y_{i,t-j}$ is the vector of explanatory variables for country *i*. The subscript, *t* = 1, 2, 3, …. T for time *t* and *i* = 1, 2, 3 … N, for the selected ASEAN countries. The symbol, μ_i denotes fixed effect parametrisation. Similarly, Equation 2 can be rewritten as VECM Model as shown in Equation 3.

$$\Delta x_{it} = \gamma_i (x_{it} = x_{i,t-1} - \lambda_i^{'} y_{i,t-1} + \mu_i + \varepsilon_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}\, \Delta x_{i,t-j} + \sum_{j=1}^{q-1} \alpha_{ij}^{'}\, \Delta y_{i,t-j} + \mu_i + \varepsilon_{it} \quad (3)$$

where γ_i is the error correction term coefficient and λ_i represents long run parameters which are assumed to be common across operation. The dynamic panel ARDL specification is depicted in Equation 4.

$$\begin{aligned} LTD_{it} = {} & \alpha_{1i} LTP_{it} + \alpha_{2i} LTP_{it-1} + \alpha_{3i} LSPThai_{it} + \alpha_{4i} LSPThai_{it-1} + \alpha_{5i} LSPIndo_{it} + \alpha_{6i} LSPIndo_{it-1} \\ & + \alpha_{7i} LTC_{it} + \alpha_{8i} LTC_{it-1} + \alpha_{9i} LRPI_{it} + \alpha_{10i} LRPI_{it-1} + \alpha_{11i} LER_{it} + \alpha_{12i} LER_{it-1} + \alpha_{13i} LINF_{it} \\ & + \alpha_{14i} LINF_{it-1} + \alpha_{15i} LHEPK_{it-1} + \lambda_i LTD_{i,t-1} \mu_i + \varepsilon_{it} \end{aligned} \quad (4)$$

The error correction model (of the long run equation presented in Equation 4) is shown in Equation 5.

$$\begin{aligned} \Delta LTD_{it} = {} & \gamma_i (LTD_{i,t-1} - \delta_{0i} - \delta_{1i} LTP_{i,t-1} + \delta_{2i} LSPThai_{i,t-1} + \delta_{3i} LSPIndo_{i,t-1} + \delta_{4i} LTC_{i,t-1} \\ & + \delta_{5i} LRPI_{i,t-1} + \delta_{6i} LER_{i,t-1} + \delta_{7i} LINF_{i,t-1} + \delta_{8i} LHEPK_{i,t-1}) + \alpha_{1i} \Delta LTP_{it} + \alpha_{2i} \Delta LSPThai_{it} \\ & + \alpha_{3i} \Delta LSPIndo_{it} + \alpha_{4i} \Delta LTC_{it} + \alpha_{5i} \Delta LRPI_{it} + \beta_{6i} \Delta LER_{it} + \beta_{7i} \Delta LINF_{it} + \beta_{8i} \Delta LHEPK_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

The estimation procedures are using Newton-Raphson method. The coefficient of γ_i is expected to be negative if the model exhibits a usual return to long run equilibrium. Accordingly, the estimates of the PMG parameters are consistent and asymptotically normally distributed for both stationary and non-stationary regressors (Pesaran, Shin, & Smith, 1999).

4. RESULTS AND DISCUSSION

The analysis began by conducting post estimation diagnostic tests to avoid spurious result and appeared to be valid, robust, and reliable conclusion. The result as presented in Table 1 shown that the null hypothesis of no serial correlation, normality of the distribution of residuals, no functional form misspecification, and homoscedasticity could not be rejected.

Table 1: Diagnostic Tests of the Long Run Equilibrium Model

Null Hypothesis	Test Statistics
No Autocorrelation	$\chi^2_{(1)}$ = 1.257[0.262]
The Model is Correctly Specified	$\chi^2_{(1)}$ = 0.741[0.389]
Normality of Error Term	$\chi^2_{(2)}$ = 1.50[0.472]
Homocedasticity	$\chi^2_{(1)}$ = 0.143[0.705]

Source: Author's Computation.

The estimated long-run coefficients of the variables are normalized on the demand for international medical tourism. The empirical result of the long-run elasticities for the variables is presented in Table 2. Even though the magnitude of the estimates is found slightly different from one another, most of the variables are statistically significant in determining international medical tourism demand for Malaysia.

The empirical result as presented in Table 2 indicates most of the regressors are statistically significant except for the medical tourism prices in the substitute destinations (Thailand and Indonesia) and inflation in the long run.

Table 2: Result of Long Run Elasticities for International Demand for Medical Tourism

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTP	-0.057	0.015	-3.934	0.011
LSPThai	-10.029	5.163	-1.943	0.109
LSPIndo	0.112	1.186	0.095	0.928
LTC	-0.304	0.103	-2.957	0.032
LRPI	1.175	0.147	7.973	0.001
LINF	-0.019	0.116	-0.159	0.880
LER	1.638	0.797	2.055	0.095
LHEPK	0.095	0.003	2.777	0.039

Source: Author's Computation.

The short run result presented in Table 3 reveals that only the price medical in Thailand is found not statistically significant. Nevertheless, the sign of the coefficient is found to be theoretically correct. Specifically, the price of medical tourism is statistically significant in affecting the demand for medical tourism in Malaysia. The finding is aligned with the previous authors (Pagan & Horsfall, 2020; Heung et al., 2010; Hopkins et al., 2010). This implies that 1% increase in price of medical tourism will lead to decrease in the demand for Malaysia's medical tourism by 0.06%. This appear that Malaysia's medical tourism demand is inelastic in nature.

The findings further revealed that travelling cost is negatively related to medical tourism demand for Malaysia (Awang et al., 2015). The estimated coefficient shows that 1% increase in traveling cost will decrease the level of demand for international demand for Malaysia's medical tourism by 0.30%. This is an indication that Malaysia needs to reduce it transport cost to encourage more medical tourists into the country. The study also investigates the effect of real per capita income in the origin countries on demand for medical tourism in Malaysia. The result reveals that 1% increase in real per capita income will increase demand for medical tourism in Malaysia by 1.18% in the long run.

The exchange rates variable is expected to possess a positive relationship with the demand for medical tourism. The result indicates that 1% increase in exchange rate of the country origin relative to the destination country will increase medical tourism demand for the destination country by 1.64% (Tang & Lau, 2017). Therefore, tourists will increase the demand for medical tourism and take advantage that arise from the deviation of the law of one price.

For the health expenditure variable, the result indicates that 1% increase in per capita health expenditure in the country of origin will lead to an increase in the demand for international medical tourism by 0.10%. The finding is parallel with Haque et al. (2018).

The short-run elasticities as presented in Table 3, shows that all variables are statistically significant in the short run except price of medical tourism in the substitute destination, Thailand. The short run result also shows the coefficient of the error correction term that measures the speed of adjustment, which is the reasonable length of time taken for deviation to adjust back to equilibrium in the long run. The speed of adjustment in this study indicates that about 56% of deviations that occur in the short run will adjust back to equilibrium within the subsequent year.

Table 3: Result of Short Run Elasticities for International Demand for Medical Tourism

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT_{t-1}	-0.564	0.025	-22.743	0.000
D(LTP)	0.161	0.002	105.063	0.000
D(LSPThai)	5.240	2.838	1.847	0.162
D(LSPIndo)	-1.604	0.432	-3.715	0.033
D(LTC)	-0.103	0.001	-94.749	0.000
D(LRPI)	-2.724	0.558	-4.882	0.016
D(LINF)	-1.135	0.011	-105.956	0.000
D(LER)	-0.078	0.006	-13.426	0.001
D(LHEPK)	0.001	1.24E-06	759.162	0.000

Source: Author's Computation.

5. CONCLUSION

Tourism industry plays an important role in propelling Malaysia towards the status of developed countries. With dynamic and rapid growth in the medical tourism, it is expected that Malaysia will benefit from it by attracting more medical tourists to Malaysia. This study attempts to determine the major factors that influence the inbound of medical tourists to Malaysia by using the PMG/ARDL modelling. The estimated model indicates the existence of cointegration relationship among the variables of interest in this study. The empirical results of the study further revealed that the price of medical tourism, travelling cost, real per capita income, exchange rate and health expenditure are statistically significant in influencing inbound of international medical tourists to Malaysia. Additionally, price of medical tourism in the substitute destinations and inflation are also statistically significant in determining international demand for medical tourism in Malaysia in the short run.

Based on the empirical findings, we propose several potential policies to attract more international medical tourists to Malaysia. In term of price of medical tourism, Malaysia needs to maintain it price competitiveness relative to other substitute destinations in the region since this variable is statistically significant in affecting international demand for medical tourism in Malaysia Besides, in order, to encourage more medical tourists to Malaysia, policymakers need to reduce the transport cost because this factor is also statistically significant in affecting medical tourists. Further, to optimize international medical tourism growth, the quality of medical service provided must be improved through training and development as well as specialization of human

resources operating in the medical tourism industry. Besides, in promoting medical tourism industry in Malaysia, policymakers and market participants should influence necessary changes in medical tourism framework to ensure that services are effective and efficient.

To recapitulate, medical tourism participants in Malaysia should practice socially responsible investment (SRI) with the main aim to stabilize between sustainable development and ethical investment. Additionally, the new research framework can be employed by tourism policy makers to assist the responsible investment as well as sustainable development of the medical tourism sector.

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APPENDIX

The lag length selection is managed by comparing various models estimated with different lag length. This is required because the pooled mean group (PMG) requires selection of a suitable lag length for the equations of individual countries. The various lag lengths approximation to determine the suitable model is represent as follow:

Table 4: PMG Lag Length Selection

Model	ARDL order	AIC	SBC
1	(1,0,0,0,0,0,0,0,0)	-1975.64	-2013.15
2	(1,1,1,1,1,1,1,1,1)	-1975.79	-2013.27
3	(2,1,1,1,1,1,1,1,1)	-2197.93	-2435.13

Source: Author's computation

An appropriate lag is selected based on the minimum value of Akaike Information Criteria (AIC) and Schwarz Bayesian Criteria (SBC). Accordingly, the minimum values of the information criteria indicate that model 3 as the most applicable model. This is divulged from the least values of the selected lag length in the table and the suitable model for this study is chosen to be PMG of orders (2,1,1,1,1,1,1,1,1).