ASSESSING THE TOURISM-LED GROWTH HYPOTHESIS AND THE DEMAND FOR TOURISM IN MALAYSIA

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ABSTRACT

Tourism is one of the rapidly growing service sectors in the world. This impressive performance has sparked the interest of Malaysia's government to promote the tourism sector as one of the National Key Economic Areas (NKEA) to transform Malaysia into a high-income nation by 2020. Nevertheless, as economic globalisation gathers momentum, there are criticisms that tourism may not significantly stimulate long-term economic growth as many informal agents bring in illegal workers to Malaysia using the tourism channel as a conduit, and it is hard to differentiate between genuine tourists and those who arrive in search of jobs. This is attributable to the fact that high rates of arrivals may not necessarily equate higher rates of tourism earnings because not all arrivals are genuine tourists. As a latecomer into the tourism industry, of course, Malaysia has also faced a great deal of challenges to obtain genuine tourists and a share of this market. This has revealed the need to assess the role of tourism in Malaysia's economic growth and also the key factors that inspire tourists' decision to visit Malaysia.

In light of the above concerns, this thesis purports to provide a critical assessment on the tourism-led growth (TLG) hypothesis and the demand for inbound tourism in Malaysia using non-stationary time series and panel data approaches. Essentially, unit root, cointegration and the Granger causality tests are the main econometric techniques used to investigate the issues raised.

Generally, the analyses can be segregated into three major parts. First, this thesis examines the validity of the TLG hypothesis in Malaysia at the aggregate level. Second, this thesis attempts to expand the analysis by investigating the validity as well as the

stability of the TLG hypothesis with respect to tourist arrivals from 12 major tourists-generating markets. The major tourist-generating markets are Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea, Taiwan, Thailand, the United Kingdom and the United States. After verifying the validity of the TLG hypothesis in Malaysia, the third component of this thesis is focused on assessing the behaviour of inbound tourism demand in Malaysia.

Several main findings are worth noting. First, at the aggregate level of analysis, the results show that the TLG hypothesis is valid. Second, at the disaggregated level of analysis, the results reveal that only 10 out of 12 tourism markets exhibit consistent support to the TLG hypothesis in Malaysia, and most of them were developed countries. This evidence suggests that the TLG hypothesis is still valid in Malaysia, and to optimise resource utilisation, tourism marketing policies should target those markets that could persistently contribute to economic growth. Finally, research on the demand for inbound tourism in Malaysia identified that apart from economic factors, tourists' decision-making of where and when to go is also highly dependent on environmental quality, security and health factors. Therefore, Malaysia's government and the industry stakeholders should take into consideration these factors in their planning to attract global tourists to visit Malaysia. In doing so, more genuine tourists can be attracted, and economic growth can be sustained.

ABSTRAK

Pelancongan merupakan salah satu sektor perkhidmatan yang berkembang pesat di dunia. Kepesatan sektor ini telah mendorong kerajaan Malaysia mempromosikan sektor pelancongan sebagai salah satu Bidang Ekonomi Utama Negara (NKEA) untuk mentranformasikan Malaysia kepada sebuah negara berpendapatan tinggi pada tahun 2020. Ekoran daripada globalisasi ekonomi, terdapat kritikan terhadap keupayaan sektor pelancongan menjana pertumbuhan ekonomi jangka panjang kerana ramai agensi-agensi tidak formal membawa masuk pekerja-pekerja asing tanpa izin ke Malaysia melalui saluran pelancongan dan adalah amat sukar untuk mengenalpasti sama ada seseorang itu pelancong sebenar ataupun pendatang yang bermotif mencari pekerjaan. Ini telah membukitkan bahawa kadar ketibaan pelancong asing yang tinggi tidak semestinya mencerminkan hasil pelancongan yang tinggi kerana bukan semua pendatang adalah pelancong sebenar. Sebagai sebuah negara yang lambat berkecimpung dalam industri pelancongan, sudah tentu ia menghadapi pelbagai cabaran dan rintangan untuk memperoleh pasaran pelancongan dan pelancong sebenar. Kekurangaan sedemikian telah menandakan keperluan untuk mengkaji peranan pelancongan terhadap pertumbuhan ekonomi Malaysia dan juga faktor-faktor utama yang mempengaruhi keputusan para pelancong memilih Malaysia sebagai destinasi pelancongan. Justeru, tesis ini ingin menyediakan satu penilaian kritikal terhadap hipotesis pertumbuhan pacuan-pelancongan dan permintaan pelancongan di Malaysia dengan menggunakan kaedah ketidakpegunan data siri masa and kaedah ketidakpegunan data panel. Secara khusus, ujian punca unit, ujian kointegrasi dan ujian sebab-penyebab Granger merupakan kaedah-kaedah ekonometrik utama yang digunakan dalam kajian ini.

Secara umumnya, analisis ini boleh dibahagikan kepada tiga bahagian utama. Pertamanya, tesis ini mengkaji kesahihan hipotesis pertumbuhan pacuan-pelancongan dari perspektif agregat. Keduanya, tesis ini cuba memperincikan kajian dengan mengkaji kesahihan dan kestabilan hipotesis pertumbuhan pacuan-pelacongan di Malaysia dengan merujuk kepada 12 pasaran pelancongan utama. Pasaran pelancongan utama yang terlibat dalam kajian ini adalah Australia, Brunei, China, Indonesia, Jepun, Singapura, Korea Selatan, Taiwan, Thailand, United Kingdom dan Amerika Syarikat. Setelah menentukan kesahihan pertumbuhan pacuan-pelancongan di Malaysia, analisis seterusnya adalah untuk meneliti tingkah laku permintaan pelancongan di Malaysia.

Beberapa penemuan utama kajian ini perlu ditekankan. Pertamanya, dari perspektif aggregat, keputusan kajian ini menyokong hipotesis pertumbuhan pacuan-pelancongan di Malaysia. Keduanya, dari perspektif *disaggregate* pula, kajian ini mendapati bahawa hipotesis pertumbuhan pacuan-pelancongan di Malaysia adalah sahih and stabil bagi hanya 10 daripada 12 pasaran pelancongan yang kebanyakannya adalah terdiri daripada negara maju. Walau bagaimanapun, penemuan ini membukitkan bahawa hipotesis pertumbuhan pacuan-pelancongan di Malaysia masih sahih, tetapi dasar-dasar pemasaran pelancongan perlu memberi tumpuan kepada pasaran-pasaran pelancongan yang mampu menjana pertumbuhan ekonomi Malaysia yang berterusan. Akhirnya, kajian tingkah laku permintaan pelancongan di Malaysia telah mengenalpasti bahawa selain daripada faktor-faktor ekonomi, pilihan destinasi pelancongan oleh para pengunjung juga bergantung kepada faktor-faktor kualiti alam sekitar, keselamatan dan kesihatan. Lantaran itu, kerajaan Malaysia dan organisasi pelancongan perlu mengambilkira faktor-faktor ini dalam perancangan untuk meningkatkan kadar ketibaan pelancong di Malaysia. Dengan ini, pelancong sebenar dapat ditingkatkan dan seterusnya menjana pertumbuhan ekonomi jangka panjang.

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CHAPTER 1:

BACKGROUND AND MOTIVATION OF STUDY

1.1 An Overview of World Tourism

Economic growth and prosperity have often been linked to growth in the agricultural, construction and manufacturing sectors as well as in the inflows of foreign capital for investment and capacity building purposes (Sinclair, 1998). This assumption has to a large extent downplayed the role of tourism in economic growth and reinforced the notion that tourism is a non-growth oriented sector thus attracting little interest from both economists and government planners alike (Papatheodorou, 1999). However, research has affirmed that tourism is one of the largest and most rapidly growing service sectors in the world (McIntosh, Goeldner and Ritchie, 1995). Tourism has also been acknowledged as an alternative means to generate economic growth (Belloumi, 2010; Clancy, 1999).

Global tourism patterns have undergone an exponential growth since the advent of air travel. In 1950, approximately 25 million international tourist arrivals were recorded. By 1960, the number had increased to 69.3 million visitors before surging ten-fold to 687 million visitors in 2000. As of 2010, the numbers have increased to approximately 940 million visitors in 2010, a 40 per cent growth from a decade earlier. In fact, the United Nations World Tourism Organisation (UNWTO, 1998) forecast that the international tourism sector will continue to grow in the foreseeable future with the number of international tourist arrivals expected to top 1.6 billion visitors in 2020.

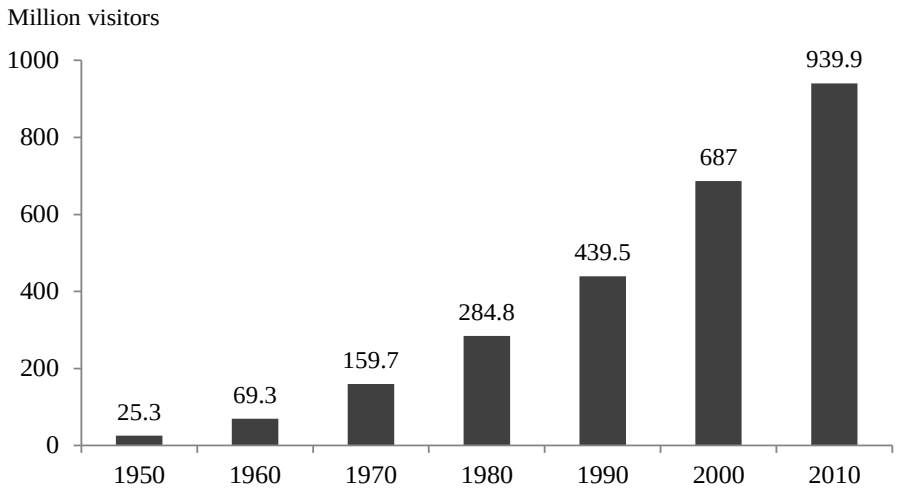


Figure 1.1: The Trend of World Tourist Arrivals

Although the overall trend highlights that international tourist arrivals have undergone an exponential growth pattern since the 1950s, there have been periods of sluggish and even negative growth due to several political, economic and health crises such as the oil price crisis in the mid-1970s, the global recession in the mid-1980s, the Persian Gulf War in 1991, the Asian financial crisis in late 1997, the terrorist attacks at the World Trade Centre in New York and the Pentagon in the United States in 2001, the outbreak of Severe Acute Respiratory Syndrome (SARS) and avian flu in 2003, and the global financial crisis in late 2007.

In terms of favoured destinations, Figure 1.2 illustrates that Europe was the most popular destination, receiving approximately 51 per cent of the world's tourist arrivals. Asia and the Pacific region received 22 per cent of tourist arrivals while the Americas accounted for approximately 16 per cent of world tourist arrivals.

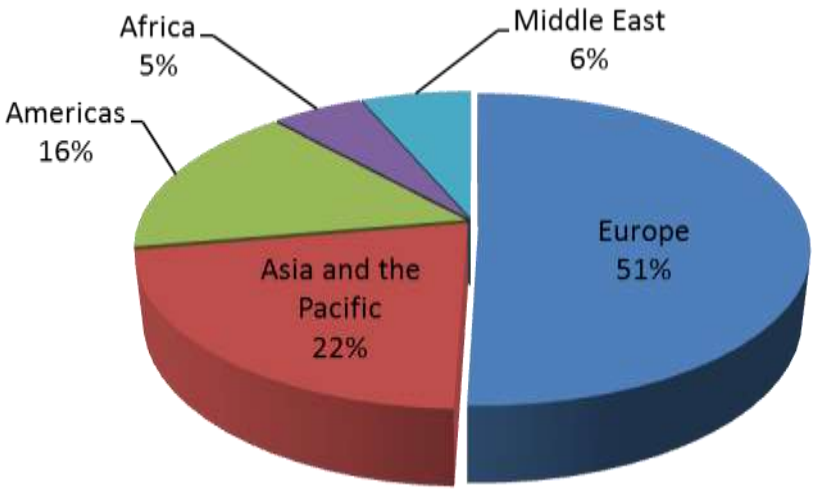


Figure 1.2: The 2010 World Tourist Arrivals by Region

Less popular tourism destinations include Africa (5 per cent of global tourist arrivals) and the Middle East (6 per cent) with the former being often disadvantaged by its poor tourism infrastructure and superstructure (Theobald, 1994). In contrast, tourism growth in the Middle East was hindered by political instability (Vellas and Bécherel, 1995).

1.2 An Overview of Tourism in Malaysia[1]

Malaysia is located in the Southeast Asian region and is well endowed with abundant natural resources and a vibrant economy that is anchored in manufacturing and services and supported by Malaysia's traditional primacy as a major producer of primary commodities. A prominent component of Malaysia's burgeoning service sector is the tourism sector. As part of efforts to expand the role of this sector, the Tourism Development Corporation was established in 1972 to promote and market Malaysia as a major tourism destination. The TDC was then replaced by the Malaysian Tourism

[1] Part of this section has been published in *Asia Pacific Journal of Tourism Research*.

Promotion Broad (MTPB) in 1992. It has expanded on the TDC's role in garnering more international tourist arrivals to Malaysia.

Table 1.1: Development Allocation for Tourism Sector in Malaysia

No.	The Malaysian Plans	Allocation (RM, Million)
1.	First Malaysian Plan	–
2.	Second Malaysian Plan (1971 – 1975)	8.59
3.	Third Malaysian Plan (1976 – 1980)	27.19
4.	Fourth Malaysian Plan (1981 – 1985)	40.16
5.	Fifth Malaysian Plan (1986 – 1990)	140.50
6.	Sixth Malaysian Plan (1991 – 1995)	746.30
7.	Seventh Malaysian Plan (1996 – 2000)	605.50
8.	Eighth Malaysian Plan (2001 – 2005)	1118.30
9.	Ninth Malaysian Plan (2006 – 2010)	1847.90

Source: Various issues of the Malaysian Plans

The intensification of efforts to position Malaysia as a premier tourism destination in Asia is evident in the increase in allocations under the different Malaysian Plans to finance tourism infrastructure and superstructure development. Table 1.1 shows the dramatic growth in financial outlays for tourism purposes in Malaysia. In fact, development allocation for tourism increased over 200 times from RM8.6 million under the Second Malaysian Plan (1971-1975) to RM1.8 billion in the Ninth Malaysian Plan (2006-2010) of which a significant amount was used to upgrade and maintain tourism-related facilities and amenities.

Apart from development allocation, Figure 1.3 shows that the general trajectory of tourist arrivals in Malaysia has also been consistently upward. Although there have been intermittent phases of stagnancy and even negative growth, the upward trend has been fostered by a slew of dynamic tourist friendly policies conceptualised to attract tourists that in turn has contributed towards the inflow of foreign exchange, the creation of jobs

and the optimal provision and utilisation of tourism infrastructure. As a result of these efforts, the number of international tourist arrivals to Malaysia mushroomed from 800,000 visitors in 1980 to 3.1 million visitors in 1985, and subsequently to 4.8 million visitors in 1989. Apart from that, cumulated tourism receipts from 1980 to 1985 amounted to USD2,986.6 million, and this increased further to USD5,743.4 million from 1985 to 1989.

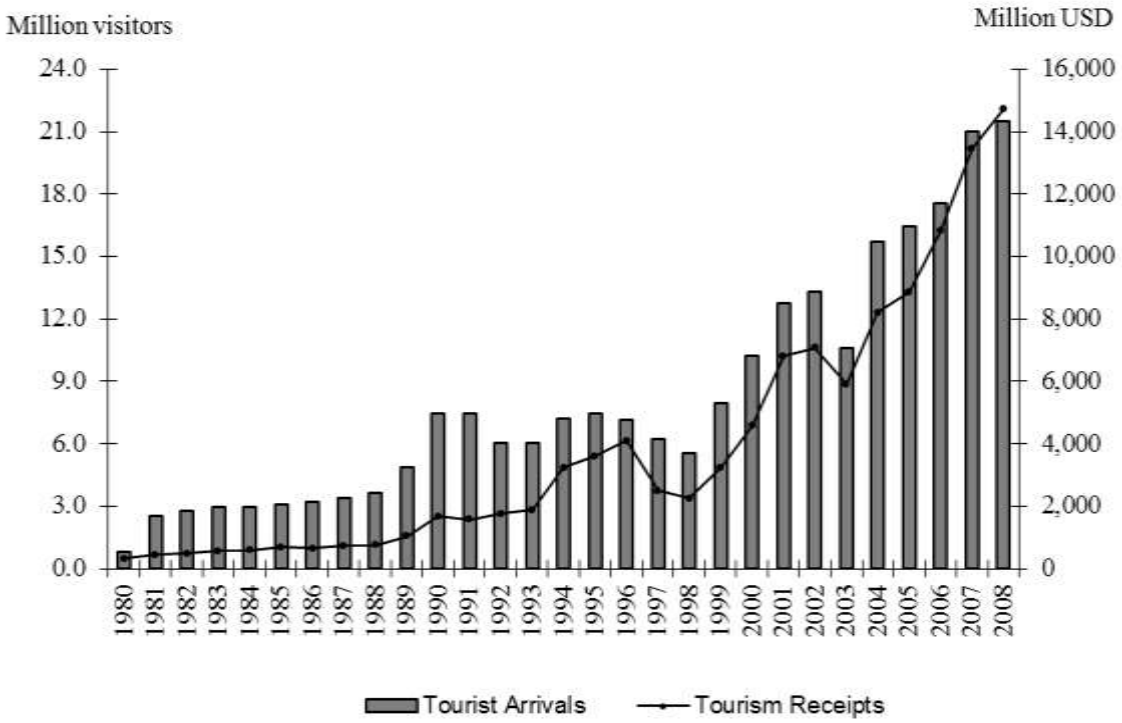


Figure 1.3: The Plots of Tourist Arrivals and Tourism Receipts for Malaysia

In order to further enhance the growth of the tourism industry in Malaysia, the first Visit Malaysia Year (VMY) campaign was launched in 1990. International tourist arrivals to Malaysia surged from 4.8 million to 7.4 million visitors from 1989 to 1990, which is an almost 54 per cent increase in arrivals of international visitors. In addition, tourism receipts grew by 61 per cent in 1990 compared to that 1989. However, as a result of the Persian Gulf War the number of international tourist arrivals to Malaysia decreased

moderately to 5.8 million visitors (–21.5 per cent) in 1991 while tourism receipts dropped to USD1,572.3 million (–5.6 per cent). In 1994, Malaysia launched the second VMY campaign with the hope of drawing in more tourists. Despite intensive promotional efforts, the results lagged far behind those of the first VMY campaign in 1990. In fact, the second VMY campaign generated a growth of only 10.7 per cent in 1994.

In 1996, Malaysia experienced a decline in international tourist arrivals of 5.3 per cent, from 7.5 million visitors in 1995 to 7.1 million visitors in 1996, as a result of the cholera outbreak in Sabah. Furthermore, there was a series of epidemics in early 1997, such as the Coxsackie B viral epidemic in Sarawak and severe dengue fever in Penang and environmental problems such as the haze phenomenon. These problems were also reported by the foreign media, the publicity of which also affected the arrival of international tourists. Such was the impact of the decline in tourist arrivals, even the national airline, i.e. the Malaysian Airline System (MAS) suffered a loss due to flight cancellation. The Asian financial crisis that set in mid-1997 also had a negative effect on countries in the region. Tourist arrivals to Malaysia dropped by 13 per cent in 1997 and 10.6 per cent in 1998. However, this drop was mitigated by Malaysia hosting the Commonwealth Games in 1998 and the Sepang Formula One Malaysian Grand Prix in the same year. Both events put Malaysia in the international lime light and thus ensured that tourist arrivals to Malaysia remained resilient in 1999 with a record 7.9 million visitors arriving. This was an almost 43 per cent increase compared to the figure in 1998.

International tourist arrivals to Malaysia continued to escalate to 12.8 million, 16.4 million and 21.5 million visitors in 2001, 2005 and 2008, respectively. This surge of tourist arrivals led to a rise in tourism receipts, which contributed significantly to the Malaysian economy. Nevertheless, one-off incidents continue to bedevil international tourist arrivals. For instance, the terrorist attacks at the Pentagon in the United States and the World Trade Centre (WTC) in New York on September 11, 2001 seriously affected the tourism industry in Malaysia. Owing to this incident, international tourist arrivals dropped from 9.3 million visitors in September 2001 to 5.9 million visitors in October 2001. Apart from this, epidemics like the Severe Acute Respiratory Syndrome (SARS) and avian flu in 2003 weighed down tourist arrivals to Malaysia. In April 2003, Malaysia experienced its lowest tourist arrivals in the millennium (only 4.5 million visitors) due to SARS and the avian flu epidemics.

To commemorate Malaysia's 50 years of independence, the third edition of the VMY campaign was launched in 2007 to further promote Malaysia as a premier tourism destination in the region. For example, the "Eye on Malaysia" was set up to kick-start the celebrations of VMY 2007 (Tourism Malaysia, 2007). As a result, international tourist arrivals increased from 20.9 million visitors in 2007 to 22.1 million visitors in 2008 while tourism receipts also increased by approximately 8 per cent for that particular year. Malaysia was recognised as the "Best International Tourism Destination of 2008" in an annual survey conducted by Global Traveler magazine (Tourism Malaysia, 2008).

1.3 Problem Statement and Significance of the Study

Historically, tourism has been viewed as a non-productive sector that contributed little to economic growth (Papatheodorou, 1999; Vanhove, 2011). However, this view has gradually evolved as research reveals that tourism does contribute to economic growth. In fact, the role of tourism in stimulating economic growth is acknowledged as the tourism-led growth hypothesis.

Despite being a laggard in the tourism sector, Malaysia has moved swiftly in establishing itself as a prominent tourism destination through a variety of tourist friendly policies and tourist attracting initiatives. Consequently, international tourist arrivals to Malaysia increased tremendously from 5.8 million visitors in 1991 to 24.6 million visitors in 2010. Since 1993, Malaysia has been ranked as one of the top three most visited destinations in Asia (Cheah, 1995; Zain, 2005). Furthermore, the Tenth Malaysian Plan (2011-2015) also seeks to set out to promote the tourism sector as one of the National Key Economic Areas (NKEA) to transform Malaysia into a high-income nation by 2020.

Nevertheless, there are criticisms that tourism may not significantly stimulate long-term economic growth as tourism earnings is significantly less than tourist arrivals. For instance, the UNWTO (2012) noted that Malaysia's ranking in terms of earnings was much lower than the ranking by arrivals, and that from 1990 to 2000, the share of tourism receipts to GDP in Malaysia only amounted to approximately 4 per cent. Such misgivings about the tourism-led growth hypothesis are further compounded by data suggesting that not all arrivals are genuine tourists as many informal agents bring in illegal workers to Malaysia using the tourism channel as a conduit, and it is hard to

differentiate between genuine tourists and those who arrive in search of jobs (Kassim, 1997). This is attested to by the fact that the number of illegal foreign workers in Malaysia more than tripled from 600,000 in 1995 to 2.1 million by 2011 (Augustin and Lee, 2012).

In view of these counterfactual data, doubts have arisen regarding the economic policy of emphasising tourism as one of the sectors that could plausibly drive economic growth and thus assist in the attainment of a high-income status by 2020. This is because high rates of arrivals may not necessarily equate to higher rates of tourism earnings, as not all arrivals are genuine tourists. In view of these reservations, there is an urgent need to examine and comprehensively establish whether the tourism-led growth hypothesis is applicable to the Malaysian context so that policymakers can design more optimal, relevant and sustainable policies that drive long-term economic growth.

In addition to the above, analysis of contemporary research output reveals that only a few studies have analysed the tourism-led growth hypothesis and modelled the demand for tourism in Malaysia (e.g. Salleh, Othman and Ramachandran, 2007; Salleh et al., 2008; Lau, Oh and Hu, 2009; Lean and Tang, 2010). Thus, ascertaining the validity of the tourism-led growth hypothesis is of utmost importance, because the findings can provide justification for the Malaysian government to decide whether tourism can effectively promote long-term economic growth. Additionally, there is the question of whether prevailing investments in the tourism sector and the government incentives for tourism and tourism-related projects constitute the optimal use of resources to yield viable Returns on Investments (ROIs). Apart from that, modelling the demand for tourism in Malaysia is also vital in ensuring that the relevant policymakers and tourism industry stakeholders have the requisite input with which to design the appropriate

tourism marketing strategies and tourism policies. Hence, more genuine tourists would be attracted to Malaysia. Finally, modelling demand for tourism will also help policymakers and industry stakeholders to improve their tourism forecasting ability. Therefore, assessing the tourism-led growth hypothesis and the demand for tourism in Malaysia justifies immediate attention.

1.4 Objectives of the Study

The main objectives of this study are to examine the role of tourism in promoting economic growth and the demand for inbound tourism in Malaysia. Generally, this thesis consists of three major parts. The first and the second part attempt to ascertain the validity of the tourism-led growth hypothesis in Malaysia at the aggregate and disaggregate levels while the third part aims to analyse the factors that influence international tourist arrivals.

This study commences with an analysis of the validity of the tourism-led growth hypothesis in Malaysia at the aggregate level using time series data. As noted earlier, high rates of arrivals may not necessarily translate into high rates of tourism earnings, hence tourism receipts instead of tourist arrivals will be used as a proxy for tourism in this study, to ascertain the validity of the tourism-led growth hypothesis in Malaysia.

The second objective of this study is to investigate the tourism-led growth hypothesis in Malaysia at a disaggregated level using time series data. To avoid an aggregation bias problem, international tourist arrivals from 12 major tourist-generating markets will be used to examine the hypothesis. The tourism markets under consideration in this study are Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea,

Taiwan, Thailand, the United Kingdom (UK) and the United States (US). In order to strengthen the validity of the tourism-led growth hypothesis in Malaysia, the stability of the hypothesis will also be examined using disaggregated data. Hence, the results of this study may not only provide a more comprehensive perspective about the role of each tourism market in Malaysia's economic growth but also shed insight into the stability of each tourism market in enhancing economic growth. As such precise information can be relayed to policymakers who can then calibrate the requisite promotional strategies to ensure maximal returns are derived from the relevant tourism markets.

Third, this study proposes to model the demand for inbound tourism in Malaysia in order to understand the decision-making behaviour of tourists. This is because a tourist's decision-making about where to go does not only depend on economic factors but also on social and environmental factors. Specifically, this study proposes to analyse two additional explanatory variables, namely crime and pollution in order to assay their impact on the demand for tourism. To the best of our knowledge, these additional factors have not been thoroughly evaluated in contemporary tourism demand studies in Malaysia. It is envisaged that the inclusion of this assessment will enable the procurement of information pertaining to the impact of social and environmental factors on demand for tourism. This can assist the relevant stakeholders to design the requisite response strategies to address the consequences of these social and environmental problems in the tourism industry. In addition, it will also help in enhancing Malaysia's competitiveness as a tourist destination.

1.5 Structure of the Thesis

In order to achieve the objectives of this study in analysing the tourism-led growth hypothesis and the demand for tourism in Malaysia, this thesis will be organised into six chapters. Chapter 1 consists of the introduction and delineates the background, motivation, problems, and the research objectives of the study. Chapter 2 outlines a detailed literature review relevant to the issue and elaborates upon the theoretical framework that underpins the study. Chapter 3 analyses the validity of the tourism-led growth hypothesis in Malaysia at the aggregate level while Chapter 4 investigates the validity of the tourism-led growth hypothesis and the stability of the hypothesis at a disaggregated level. Chapter 5 is designed to determine the important factors that influence the demand for tourism in Malaysia. Chapter 6 concludes the study by providing a summary, proposing policy recommendations, as well as outlining the limitations of the study and suggestions for future research. The overall analytical structure of this thesis is as illustrated in Figure 1.4.

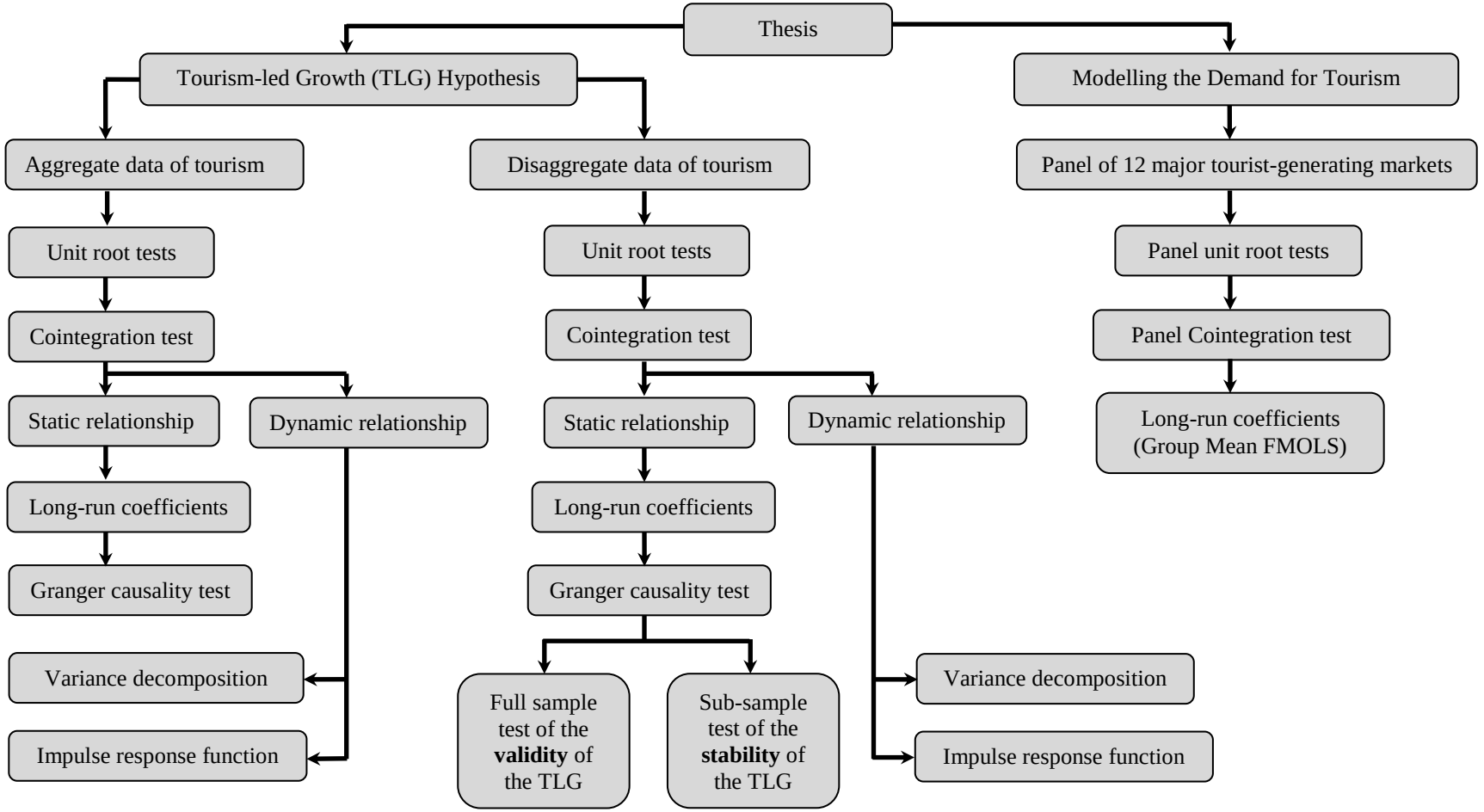


Figure 1.4: Overview of Analytical Structure of Thesis

CHAPTER 2:

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to provide the theoretical framework and critically review previous studies pertaining to the tourism-led growth hypothesis, and the demand for tourism. Discussion about key concepts and definitions of tourism are outlined in Section 2.2. Section 2.3 discusses the theoretical framework for the tourism-led growth hypothesis while Section 2.4 provides a comprehensive review of previous studies on the tourism-led growth hypothesis. Section 2.5 focuses mainly on the theoretical framework for tourism demand. Section 2.6 reviews previous empirical studies on tourism demand. Finally, the concluding remarks of this chapter are provided in Section 2.7.

2.2 Key Concepts and Definitions of Tourism

In contemporary tourism literature, tourism imparts different meanings to different people in different disciplines. Thus, it is hard to obtain a universally accepted definition of tourism. Gee, Makens and Choy (1989) noted that a clear definition of tourism is imperative for researchers to establish parameters for tourism research content. In the past few decades, scholars have tried to define the meaning of tourism. Burkart and Medlik (1974) divided the definitions of tourism into two major categories namely; the conceptual and technical categories. A conceptual definition of tourism attempts to provide a notional and a theoretical framework to understand the essential characteristics of tourism. In contrast, the technical definition of tourism attempts to

differentiate types of tourist and tourism activities. The technical definition is also known as the statistical or operational definition. This definition is used by the government and tourism organisations to compile tourism statistics in order to monitor the size and characteristics of tourism markets.

There is a plethora of conceptual definitions regarding the term *tourism*. Burkart and Medlik (1974) and Vanhove (2011) detailed that one of the oldest and most important conceptual definitions of tourism was provided by Hunziker and Krapf (1942) who defined tourism as "*a sum of the phenomena and the relationship arising from the travel and stay of non-residents, in so far as they do not lead to permanent residence and are not connected with any earning activity*". 30 years after the emergence of this seminal definition, Jafari (1977) defined tourism as "*a study of man away from his usual habitat, of the industry which responds to his needs, and of the impacts that both he and the industry have on the host socio-cultural, economic, and physical environments*". Beaver (2005) cited that in 1976, the British Tourism Society defined tourism as "*the temporary, short-term movement of people to destination outside the places where they normally live and work and their activities during the stay at each destination*". Finally, Sharpley (2002) described tourism as "*a social phenomenon which involves the movement of people to various destinations and temporary stay there*".

From the technical definition perspective, Ogilvie (1933) defined tourists as "*persons who satisfy the following two conditions: first, they are away from home for any period of less than a year; second, they are away and they spend money in the place they visit without earning it there*". Ogilvie's definition constituted one of the earliest and most prominent definitions of tourism in the technical category (Batta, 2000; Cohen, 1984; Wall and Mathieson, 2006). International agencies such as the United Nations World

Tourism Organisation (UNWTO) (1995) defined tourism as "*the activities of persons travelling to, and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes*". The foregoing definitions clearly indicate that tourism is a very broad and complex concept as it does not merely refer to a social activity and industry, but rather encompasses everything related to the socio-cultural, economic, and physical environment of a country.

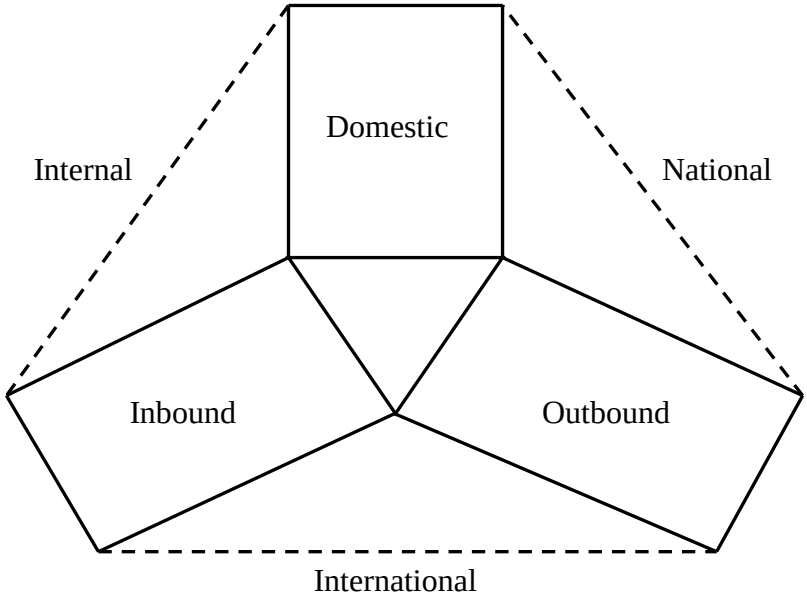


Figure 2.1: Categories of Tourism (Source: World Tourism Organisation)

The UNWTO also classified tourism into 3 major categories as illustrated in Figure 2.1 above. The 3 major categories are:

(a) *Domestic tourism* which refers to travel taken by resident visitors within their own country's boundaries.

(b) *Inbound tourism* which refers to travel taken by non-resident visitors to other countries.

(c) *Outbound tourism* which refers to travel taken by resident visitors to other countries.

These types of definitions are often merged under the following categories of tourism:

(a) *Internal tourism* is the combination of both domestic and inbound tourism.

(b) *National tourism* involves both domestic and outbound tourism.

(c) *International tourism* comprises both inbound and outbound tourism.

All these definitions of tourism imply that tourism involves (a) movement of people from one to another destination; (b) expenditure and (c) temporary stay at the visited destination. Several measurements for tourism and categories of travellers have been postulated based on these parameters. According to Lim (1997) and Crouch (1994b), the number of tourist arrivals or departures, tourism expenditure or receipts and the average length of stay are the most acceptable parameters to measure tourism with the first two proxies being frequently used in existing tourism studies.

As illustrated in Figure 2.2, there are two basic categories of travellers, namely visitors and other travellers. Theobald (1994) defined travellers as individuals who make a trip between two or more geographic locations, either in their own country (i.e. domestic travellers) or between countries (i.e. international travellers).

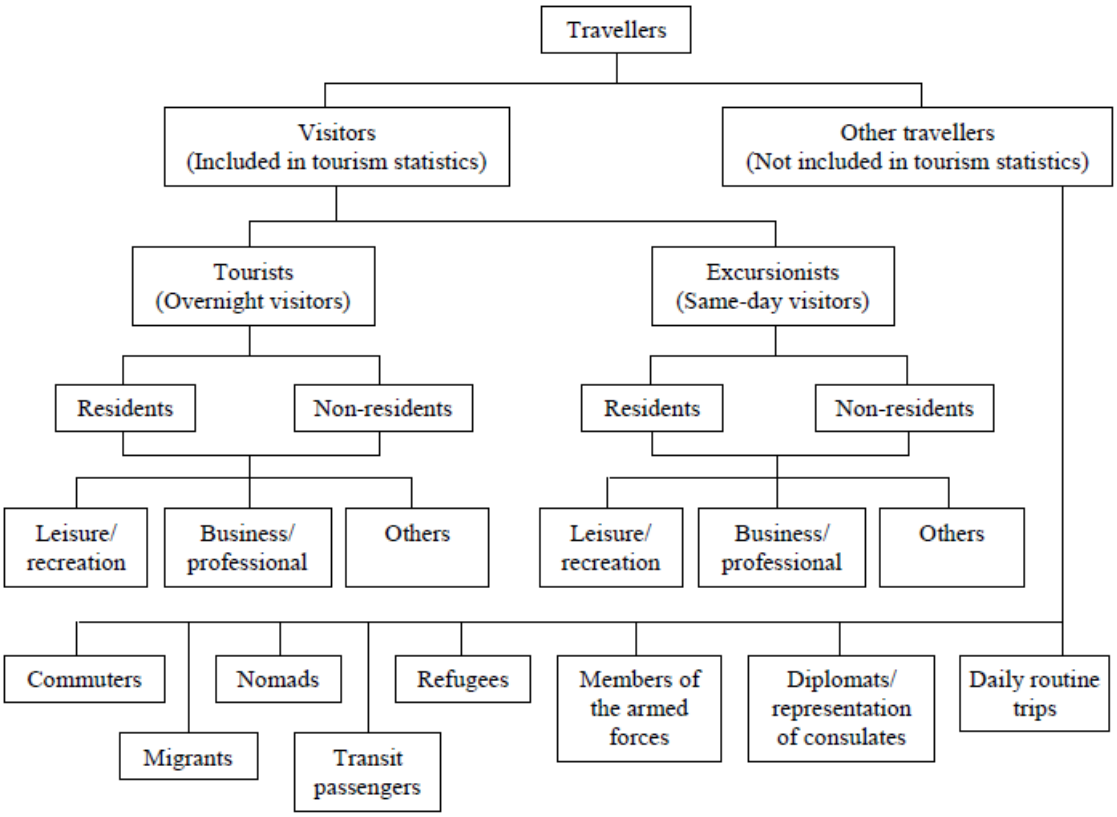


Figure 2.2: Classification of Travellers (Source: Theobald, 1994)

Based on his classification, *visitor* refers to any person travelling to a place other than that of his/her usual environment, for a period of less than a year, with the main purpose of the trip being other than the exercise of a remunerated activity. In contrast, the term *other travellers* denote types of travellers excluded from the visitors' category as they do not fulfil the criteria of visitors. Examples of other travellers are migrants, members of the armed forces, diplomats or representation of consulates, refugees, nomads, border workers who make daily routine trips, long-term students and transit passengers. However, visitors can be categorised into two major groups, namely, tourists and excursionists. *Tourist* refers to a visitor who stays more than 24 hours in the visiting destination where the journey is either for the purpose of recreation, holiday, visiting family members or friend, health, short-term study, religion, sport, business or meeting. Therefore, a tourist is also known as an overnight visitor. On the other hand,

excursionist refers to a visitor who spends less than 24 hours in the visited destination. With respect to this, an excursionist is also known as a same-day visitor. Finally, visitors (both tourist and excursionist) can be further separated into resident and non-resident visitors.

Every visitor will spend money for and during a trip. Hence, tourism expenditure is another acceptable measure of tourism. Tourism expenditures are the total consumption expenditures made by the visitor for and during his/her trip and stay at the destination. As there are inbound and outbound tourism, the UNWTO divided tourism payment from these sources into tourism receipts and tourism expenditure. Tourism receipts are those expenditures made by the international inbound visitors for and during the trip, while tourism expenditures are those expenditures made by the international outbound visitors for and during a trip. Finally, although not all visitors will stay overnight in the visiting destination, the average length of stay has also been identified as an acceptable parameter in the measurement of tourism. According to the UNWTO's definition, the average length of stay refers to the average number of nights/days a visitor stays in the visiting destination.

2.3 Theoretical Framework: Tourism-Growth Nexus

The validity of the tourism-led growth hypothesis is one of the main concerns of this study. With respect to this, this study utilises Feder's growth model to justify and explain the role of tourism in economic growth.

2.3.1 Feder's Growth Model

In this study, we borrow extensively from the theoretical framework as developed by Feder (1983) to explain the linkage between tourism and economic growth. The framework postulates that an economy can be divided into two sectors, namely, the tourism sector (T) and the non-tourism sector (N). In relation to this, the total output (Y) of a country refers to the sum of the output from both the tourism and non-tourism sectors. Hence, total output of the economy can be expressed as:

$$Y = T + N \tag{2.1}$$

It is also assumed that output in the tourism sector depends on labour and capital stock. However, the output of the non-tourism sector depends not only on the usual inputs such as labour and capital stock, but also on the output of the tourism sector. This is because the output of the tourism sector will have spill-over effects on other sectors. Feder (1983) termed these spill-over effects as externalities. The tourism sector and non-tourism sector functions are given below:

$$T = G(L_T, K_T) \tag{2.2}$$

$$N = F(L_N, K_N, T) \tag{2.3}$$

where T is the output of tourism sector, N is the output of the non-tourism sector, L_T and K_T are the labour and capital stock in the tourism sector, while L_N and K_N are the labour and capital stock in the non-tourism sector. Since the economy consists of only two sectors, the aggregation of labour and capital stock from these two sectors yields

the total amount of labour (L) and capital stock (K) in the economy which can be written as follows:

$$L_T + L_N = L \tag{2.4}$$

$$K_T + K_N = K \tag{2.5}$$

With regard to the spill-over effect or externalities generated in the tourism sector, Feder (1983) postulated that the relative factor of productivities in the two sectors would be greater than unity by an added factor, δ, i.e.

$$\frac{G_L}{F_L} = \frac{G_K}{F_K} = 1 + \delta \tag{2.6}$$

where G_K, F_K, G_L and F_L are partial derivatives of the production function with respect to particular inputs, i.e. capital (K) and labour (L). If there is no spill-over effect, thus, $\delta = 0$. In light of this, δ represents the difference between marginal productivities of labour and capital in the two sectors. Owing to higher efficiency and improved production technology in the tourism sector, marginal productivities are likely to be higher in the tourism sector compared to the non-tourism sector, thus, $\delta > 0$.

By differencing equations (2.2) and (2.3), the following is yielded:

$$\Delta T = G_L \Delta L_T + G_K \Delta K_T \tag{2.7}$$

$$\Delta N = F_L \Delta L_N + F_K \Delta K_N + F_T \Delta T \tag{2.8}$$

where Δ is the first difference operator; K_T and K_N are the capital in the tourism and non-tourism sectors, respectively; ΔL_T denotes the change of labour in the tourism sector; ΔL_N is the change of labour in the non-tourism sector; and F_T refers to the marginal spill-over effect of tourism on the output of non-tourism sectors.

Substituting equations (2.6), (2.7) and (2.8) into equation (2.1), along with further iterations the following aggregate growth equation is derived:

$$\frac{\Delta Y}{Y} = \beta_0 \frac{\Delta L}{L} + \beta_1 \frac{\Delta K}{K} + \beta_2 \frac{\Delta T}{T}$$

$$\dot{Y} = \beta_0 \dot{L} + \beta_1 \dot{K} + \beta_2 \dot{T} \qquad (2.9)$$

where the dot over the variables indicates the growth rate for the particular variables, Δ is the first difference operator, $K = (K_T + K_N)$ is the total capital, $L = (L_T + L_N)$ is the total labour force and *T*, the total amount of tourism. Based upon the equation (2.9), it is apparent that tourism is an important engine of economic growth. Tourism is an invisible export that brings in not only foreign exchange, but also encourages technological and knowledge transfers such as new managerial skills, equipment and machinery. Thus, increasing tourism exports help to ease foreign exchange constraints and thus increase a country's ability to import more advanced technology which in turn enhances efficiencies in the economy (Knight, Loayza and Villenueva, 1993; Thirlwall, 1979).

2.4 Literature Review: Tourism-Growth Nexus

In the present section, a critical review of past literature on the tourism-growth nexus published in refereed academic journals from 1976 to 2013 will be provided. 73 articles published in refereed academic journals on the relationship between tourism and economic growth were reviewed for this purpose. A summary of country-specific and multi-country studies on the tourism-growth nexus are outlined in Table 2.1 and Table 2.2, respectively. The role of tourism in economic growth has been the subject of considerable debate in both tourism and development economics' circles for the past three decades, since understanding the causal relationship between tourism and economic growth is the key towards formulating appropriate strategies and implementing successful tourism and growth policies. Owing to its significant implications on policymaking, numerous studies have been conducted over the last three decades to verify the causal relationship between tourism and economic growth. Thus far, previous tourism-growth studies failed to provide persuasive causality evidence that can be used by policymakers across countries. The existence of diverse causality outcomes when investigating the tourism-growth nexus may be attributable to differences in datasets, proxy variables and econometric methods arising from a focus on different countries, each with its unique country characteristics in areas like culture, politics, economics, institutional frameworks and tourism policies.

Table 2.1: Summary of Country-Specific Studies for Tourism-Growth Nexus

No.	Authors	Period	Countries	Methodology	Major findings of causal effect
1.	Ghali (1976)	1953-1970	Hawaii (United States)	OLS estimator	*TOUR* → *GDP*
2.	Archer (1984)	1961-1977	Barbados	OLS estimator	*TOUR* → *GDP*
3.	Balaguer and Cantavella-Jordá (2002)	1975:Q1-1997:Q1	Spain	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
4.	Narayan and Prasad (2003)	1972-2002	Fiji	ARDL; Granger causality - VECM	*TOUR* ↔ *GDP*
5.	Dritsakis (2004)	1960:Q1-2000:Q4	Greece	Johansen-Juselius; Granger causality - VECM	*TOUR* ↔ *GDP*
6.	Durbarry (2004)	1952-1999	Mauritius	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
7.	Yildirim and Öcal (2004)	1962-2002	Turkey	Johansen-Juselius	*TOUR* → *GDP*
8.	Oh (2005)	1975:Q1-2001:Q1	Korea	Engle-Granger; Granger causality - VAR	*GDP* → *TOUR*
9.	Gunduz and Hatemi-J (2005)	1963-2002	Turkey	TYDL Granger causality	*TOUR* → *GDP*
10.	Ongan and Demiröz (2005)	1980:Q1-2004:Q4	Turkey	Johansen-Juselius; Granger causality - VECM	*TOUR* ↔ *GDP*
11.	Kim, Chen and Jang (2006)	1971:Q1-2003:Q2	Taiwan (China)	Johansen-Juselius; Granger causality - VAR	*TOUR* ↔ *GDP*
		1956-2002	Taiwan (China)	Johansen-Juselius; Granger causality - VAR	*TOUR* ↔ *GDP*
12.	Louca (2006)	1960-2001	Cyprus	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
13.	Khalil, Kakar and Waliullah (2007)	1960-2005	Pakistan	Engle-Granger; Granger causality - VECM	*TOUR* ↔ *GDP*
14.	Nowak, Sahli and Cortés-Jiménez (2007)	1960-2003	Spain	Johansen-Juselius; Granger causality - VECM	*TOUR* ↔ *GDP*
15.	Brida, Carrera and Risso (2008)	1980:Q1-2007:Q2	Mexico	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
16.	Croes and Vanegas (2008)	1980-2004	Nicaragua	Johansen-Juselius; Granger causality - VAR	*TOUR* → *GDP*
17.	Lee and Chien (2008)	1959-2003	Taiwan (China)	Zivot-Andrews; Perron; Johansen and Juselius; Weak exogeneity - VECM	*TOUR* ↔ *GDP*
18.	Kaplan and Çelik (2008)	1963-2006	Turkey	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
19.	Nanthakumar, Ibrahim and Harun (2008)	1980-2007	Malaysia	Johansen-Juselius; Granger causality - VAR	*GDP* → *TOUR*
20.	Brida et al. (2009)	1994:Q1-2007:Q3	Colombia	Johansen-Juselius; Granger causality – VECM	*TOUR* → *GDP*

Continue

(Continue) Table 2.1: Summary of Country-Specific Studies for Tourism-Growth Nexus

No.	Authors	Period	Countries	Methodology	Major findings of causal effect
21.	Brida and Risso (2009)	1988-2008	Chile	Johansen-Juselius; TYDL Granger causality	*TOUR* → *GDP*
22.	Lau, Oh and Hu (2009)	1972-2004	Sarawak (Malaysia)	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
23.	Tang and Jang (2009)	1981:Q1-2005:Q4	United States	Johansen-Juselius; Granger causality - VECM	*GDP* → *TOUR*
24.	Katircioğlu (2009a)	1960-2006	Turkey	ARDL; Johansen-Juselius	*TOUR* ↮ *GDP*
25.	Katircioğlu (2009b)	1960-2006	Malta	Perron; ARDL; Granger causality - VECM	*TOUR* ↔ *GDP*
26.	Katircioğlu (2009c)	1960-2005	Cyprus	Perron; ARDL; Granger causality - VECM	*GDP* → *TOUR*
27.	Ozturk and Acaravci (2009)	1987-2007	Turkey	Zivot-Andrews; ARDL; Johansen-Juselius	*TOUR* ↮ *GDP*
28.	Zortuk (2009)	1990:Q1-2008:Q3	Turkey	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
29.	Akinboade and Braimoh (2010)	1980-2005	South Africa	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
30.	Belloumi (2010)	1970-2007	Tunisia	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
31.	Brida, Barquet and Risso (2010)	1980-2006	Italy	Johansen-Juselius; Granger causality – VECM	*TOUR* → *GDP*
32.	Brida et al. (2010)	1987:Q1-2006:Q4	Uruguay	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
33.	Brida and Monterubbianesi (2010)	1990-2005	Colombia	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
34.	Brida and Risso (2010)	1980-2006	Italy	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
35.	Gökovali (2010)	1985-2005	Turkey	OLS estimator	*TOUR* → *GDP*
36.	Kadir, Nayan and Abdullah (2010)	1994:Q1-2004:Q4	Malaysia	Johansen-Juselius; Granger causality - VECM	*GDP* → *TOUR*
37.	Katircioğlu (2010a)	1977-2007	North Cyprus	ARDL; Granger causality - VECM	*TOUR* → *GDP*
38.	Katircioğlu (2010b)	1960-2007	Singapore	ARDL; Granger causality - VECM	*TOUR* → *GDP*
39.	Kreishan (2010)	1970-2009	Jordan	Johansen-Juselius; Granger causality - VAR	*TOUR* → *GDP*
40.	Malik et al. (2010)	1972-2007	Pakistan	Engle-Granger; Johansen-Juselius; Granger causality	*GDP* → *TOUR*

Continue

(Continue) Table 2.1: Summary of Country-Specific Studies for Tourism-Growth Nexus

No.	Authors	Period	Countries	Methodology	Major findings of causal effect
41.	Lean and Tang (2010)	1989:M1-2009:M2	Malaysia	TYDL Granger causality	*TOUR* ↔ *GDP*
42.	Lee and Hung (2010)	1978-2007	Singapore	ARDL; Granger causality - VECM	*TOUR* → *GDP*
43.	Payne and Mervar (2010)	2000:Q1-2008:Q3	Croatia	TYDL Granger causality	*GDP* → *TOUR*
44.	Wang (2010)	1985-2007	China	Johansen-Juselius; Granger causality - VECM	*GDP* → *TOUR*
45.	Arslanturk, Balcilar and Ozdemir (2011)	1963-2006	Turkey	Johansen-Juselius; Rolling Granger causality - VECM	*TOUR* → *GDP*
46.	Brida, Punzo and Risso (2011)	1965-2007	Brazil	Johansen-Juselius; TYDL Granger causality	*TOUR* ↮ *GDP*
47.	Ghosh (2011)	1980-2006	India	ARDL; Johansen-Juselius	*TOUR* ↮ *GDP*
48.	Husein and Kara (2011)	1964-2006	Turkey	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
49.	Katircioğlu (2011)	1960-2007	Singapore	ARDL; Granger causality - VECM	*TOUR* → *GDP*
50.	Kreishan (2011)	1970-2009	Jordan	Johansen-Juselius; Granger causality - VAR	*TOUR* → *GDP*
51.	Lin (2011)	1983:Q1-2004:Q3	Hong Kong (China)	Variance decomposition; Impulse response function	*TOUR* → *GDP*
52.	Misha, Rout and Mohapatra (2011)	1978-2009	India	Johansen-Juselius; Granger causality - VECM	*TOUR* ↮ *GDP*
53.	Kumar and Kumar (2012)	1980-2008	Fiji	ARDL; Granger causality - VECM	*GDP* → *TOUR*
54.	Lee (2012)	1980-2007	Singapore	ARDL: Granger causality - VECM	*GDP* → *TOUR*
55.	Tang and Abosedra (2012)	1995-2010	Lebanon	ARDL; Granger causality - VECM	*TOUR* ↔ *GDP*
56.	Vanegas (2012)	1967-2010	El Salvador	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
57.	Hye and Khan (2013)	1971-2008	Pakistan	ARDL; Johansen-Juselius	*TOUR* → *GDP*

Note: *TOUR* → *GDP* means uni-directional causality runs from tourism to economic growth; *GDP* → *TOUR* means uni-directional causality runs from economic growth to tourism; *TOUR* ↔ *GDP* means bi-directional causality between tourism and economic growth; *TOUR* ↮ *GDP* means no causality exists between tourism and economic growth.
Abbreviations are defined as follows: OLS = Ordinary Least Squares; VAR = Vector Autoregression; VECM = Vector Error-Correction Model; ARDL = Autoregressive Distributed Lag; TYDL = Toda-Yamamoto-Dolado-Lütkepohl.

Table 2.2: Summary of Multi-Country Studies for Tourism-Growth Nexus

No.	Authors	Period	Countries	Methodology	Major findings of causal effect
1.	Modeste (1995)	1981-1992	3 Caribbean countries (Anguilla, Antigua and Barbuda, Barbados)	Pooled OLS	*TOUR* → *GDP*
2.	Gökovali and Bahar (2006)	1987-2002	13 Mediterranean countries	Pooled OLS; Fixed effect; Random effect	*TOUR* → *GDP*
3.	Fayissa, Nsiah and Tadasse (2008)	1995-2004	42 African countries	Fixed effect; Random effects; GMM	*TOUR* → *GDP*
4.	Lee and Chang (2008)	1990-2002	OECD countries	Pedroni; Panel Granger causality	*TOUR* → *GDP*
		1990-2002	Non-OECD countries	Pedroni; Panel Granger causality	*TOUR* ↔ *GDP*
		1990-2002	Asia countries	Pedroni; Panel Granger causality	*TOUR* → *GDP*
		1990-2002	Latin America countries	Pedroni; Panel Granger causality	*TOUR* ↔ *GDP*
		1990-2002	Sub-Sahara Africa countries	Pedroni; Panel Granger causality	*TOUR* ↔ *GDP*
5.	Proença and Soukiazis (2008)	1990-2004	4 Southern European countries	Pooled OLS; Fixed effect; Random effect	*TOUR* → *GDP*
6.	Chen and Chiou-Wei (2009)	1975:Q1-2007:Q1	Taiwan (China)	Zivot-Andrews; EGARCH-M	*TOUR* → *GDP*
		1975:Q1-2007:Q1	Korea	Zivot-Andrews; EGARCH-M	*TOUR* ↔ *GDP*
7.	Adamou and Clerides (2010)	1980-2005	162 countries	Pooled OLS; Fixed effect	*TOUR* → *GDP*
8.	Cortes-Jimenez and Pulina (2010)	1954-2000	Italy	Johansen-Juselius; Granger causality - VECM	*TOUR* → *GDP*
		1954-2000	Spain	Johansen-Juselius; Granger causality - VECM	*TOUR* ↔ *GDP*
9.	Narayan et al. (2010)	1988-2004	4 Pacific Island countries (Fiji, Tonga, Solomon Islands, Papua New Guinea)	Pedroni; Panel Granger causality – VECM	*TOUR* ↔ *GDP*
10.	Singh et al. (2010)	1970-2008	3 Americas countries (Bahamas, Barbados, Jamaica)	Larsson-Lyhagen-Lothgren; Johansen-Juselius; Panel Granger causality - VAR	*GDP* → *TOUR*

Continue

(Continue) Table 2.2: Summary of Multi-Country Studies for Tourism-Growth Nexus

No.	Authors	Period	Countries	Methodology	Major findings of causal effect
11.	Brida, Punzo and Risso (2011)	1987-2007	27 Brazilian States	GMM	*TOUR* → *GDP*
12.	Fayissa, Nsiah and Tadesse (2011)	1990-2005	18 Latin American countries	Fixed effect; Random effects; GMM	*TOUR* → *GDP*
13.	Sarmidi and Salleh (2011)	1997:Q1-2007:Q4	Malaysia-Singapore	ARDL; Granger causality - VECM	*GDP* → *TOUR*
		1997:Q1-2007:Q4	Malaysia-Thailand	ARDL; Granger causality - VECM	*TOUR* ↔ *GDP*
		1997:Q1-2007:Q4	Malaysia-Indonesia	ARDL; Granger causality - VECM	*TOUR* → *GDP*
		1997:Q1-2007:Q4	Malaysia-Brunei	ARDL; Granger causality - VECM	*GDP* → *TOUR*
14.	Seetanah (2011)	1990-2007	19 Islands countries	GMM; Panel Granger causality - VAR	*TOUR* ↔ *GDP*
15.	Tiwari (2011)	1995-2008	4 Asian countries (China, India, Pakistan, Russia)	Pooled OLS; Fixed effect; Random effect	*TOUR* → *GDP*
16.	Othman, Salleh and Sarmidi (2012)	1970-2010	Austria	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*
		1970-2010	Canada	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*
		1970-2010	China	ARDL: Granger causality - VECM	*GDP* → *TOUR*
		1970-2010	French	ARDL: Granger causality - VECM	*TOUR* → *GDP*
		1970-2010	Germany	ARDL: Granger causality - VECM	*TOUR* → *GDP*
		1970-2010	Greece	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
		1970-2010	Hong Kong (China)	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
		1970-2010	Italy	ARDL: Granger causality - VECM	*TOUR* → *GDP*
		1970-2010	Malaysia	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*

(Continue) Table 2.2: Summary of Multi-Country Studies for Tourism-Growth Nexus

No. Authors	Period	Countries	Methodology	Major findings of causal effect
	1970-2010	Mexico	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
	1970-2010	Portugal	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
	1970-2010	Spain	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
	1970-2010	Thailand	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
	1970-2010	Turkey	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*
	1970-2010	United Kingdom	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*
	1970-2010	United States	ARDL: Granger causality - VECM	*TOUR* ↮ *GDP*
	1970-2010	Netherland	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*
	1970-2010	Singapore	ARDL: Granger causality - VECM	*TOUR* ↔ *GDP*

Note: *TOUR* → *GDP* means uni-directional causality runs from tourism to economic growth; *GDP* → *TOUR* means uni-directional causality runs from economic growth to tourism; *TOUR* ↔ *GDP* means bi-directional causality between tourism and economic growth; *TOUR* ↮ *GDP* means no causality exists between tourism and economic growth.
Abbreviations are defined as follows: OLS = Ordinary Least Squares; VAR = Vector Autoregression; VECM = Vector Error-Correction Model; ARDL = Autoregressive Distributed Lag; EGARCH-M = Exponential Generalised Autoregressive Conditional Heteroskedasticity in Mean; GMM = Generalised Method of Moments.

Generally, the causal relationship between tourism and economic growth can be classified into four plausible outcomes or hypotheses, wherein each has an important implication for both tourism and growth policies:

(a) *Growth hypothesis*: This hypothesis asserts a uni-directional causality running from tourism to economic growth. This hypothesis postulates that tourism is a stimulator of economic growth. Therefore, any policy initiative to expand the tourism sector will significantly enhance economic growth and development. On the other hand, implementation of policies that constrain the expansion of the tourism sector will impede economic growth.

(b) *Contraction hypothesis*: The contraction hypothesis refers to a uni-directional causality running from economic growth to tourism. In this scenario, the expansion of the tourism sector may not significantly enhance economic growth. Therefore, constraining tourism may have little or no adverse impact on economic growth because tourism does not Granger-cause economic growth.

(c) *Feedback hypothesis*: This hypothesis asserts a bi-directional causal relationship between tourism and economic growth. Under this hypothesis, tourism expansion stimulates economic growth while economic growth also impacts upon tourism. Therefore, a tourism policy orientated to promote tourism will enhance economic growth.

(d) *Neutrality hypothesis*: This hypothesis suggests that tourism and economic growth are not related due to the absence of a causal relationship between tourism and economic growth. In this context, implementation of tourism policies to reduce tourism activity will not impact upon economic growth.

From the above, it is apparent that the first and the third causality outcomes support the tourism-led growth hypothesis because both suggest that tourism plays an important role in stimulating economic growth. The following sections will focus on reviewing the literature pertaining to the tourism-growth nexus.

2.4.1 Review of Studies Based on Income Group, Geography and Methodologies

A common feature of studies analysing the tourism-growth nexus has been their use of a variety of model specifications, geographical data, time frames and econometric techniques to determine the existence of the aforementioned nexus as illustrated in Table 2.1 and Table 2.2.

2.4.1.1 Income Group and Geography

A majority of the reviewed studies focused on developing countries, while a small number focused on developed countries. According to the World Bank's definition, developing countries refer to middle-income and low-income countries while developed countries refer to high-income countries.

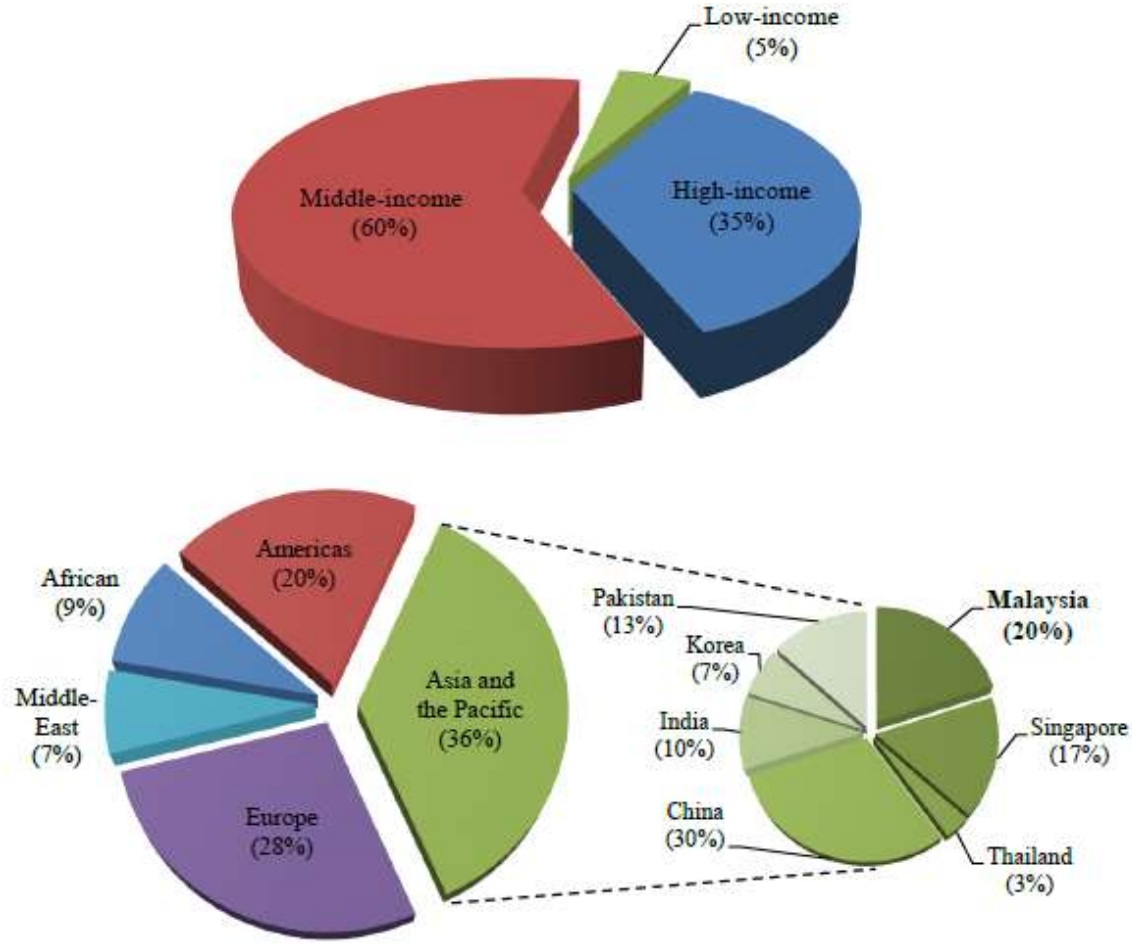


Figure 2.3: Classification of Studies by Income Group and Geographical Region

Figure 2.3 illustrates that 60 per cent of the reviewed studies focused on middle-income countries while 35 per cent of the reviewed studies investigated the tourism-growth nexus in the high-income countries. Only 5 per cent of the studies covered low-income countries. Tourism-growth nexus studies that focus on low-income countries in their analysis include Lee and Chang (2008), Akinboade and Braimoh (2010), Fayissa, Nsiah and Tadesse (2011), and Seetanah (2011). However, none of these studies focus exclusively on a particular individual low-income country. The lack of country-specific study for low-income countries may be attributable to either incomplete or unavailable long time series data.

In terms of geographical region, studies on the tourism-growth nexus are mainly focused on Asia and the Pacific region (35 per cent) followed by Europe (28 per cent), Americas (20 per cent), African (9 per cent) and the Middle-East (7 per cent). With regard to Asia and the Pacific region, it was observed that studies on Malaysia and China (i.e. including Taiwan and Hong Kong) covered half of all reviewed studies. Nanthakumar, Ibrahim and Harun (2008), Lau, Oh and Hu (2009), Lean and Tang (2010), Wang (2010), and Othman, Salleh and Sarmidi (2012) are several relevant examples of studies on Malaysia and China. Besides Malaysia (20 per cent) and China (30 per cent), about 17 per cent of the tourism-growth studies in Asia and the Pacific region were related to Singapore while the rests of the studies were focused on Korea (7 per cent), Pakistan (13 per cent), India (10 per cent) and Thailand (3 per cent).

2.4.1.2 Methodologies

Figure 2.4 shows the classification of tourism-growth studies based upon model specification. Bi-variate model refers to a two variables system while a tri-variate model refers to a three variables system, and multivariate model refers to a system with more than three variables. The literature survey shows that 25 per cent of studies conducted thus far used the bi-variate model to investigate the Granger causality between tourism and economic growth (see Figure 2.4). In contrast, another group of tourism-growth studies conducted by Balaguer and Cantavella-Jordá (2002), Kaplan and Çelik (2008), Akindoade and Braimoh (2010), and Katircioğlu (2010a) re-investigated the Granger causality between tourism and economic growth using either a tri-variate or multivariate model due to their contention that the omitted variable bias in a bi-variate model could lead to spurious results. In addition to tourism and real GDP variables as found in bi-variate models, Balaguer and Cantavella-Jordá (2002), Cortes-Jimenez and Pulina

(2010), Katircioğlu (2010a), Brida, Punzo and Risso (2011), and Tiwari (2011) are some examples of studies that included real exchange rate, capital, labour, and/or other potential variables to investigate the causality between tourism and economic growth.

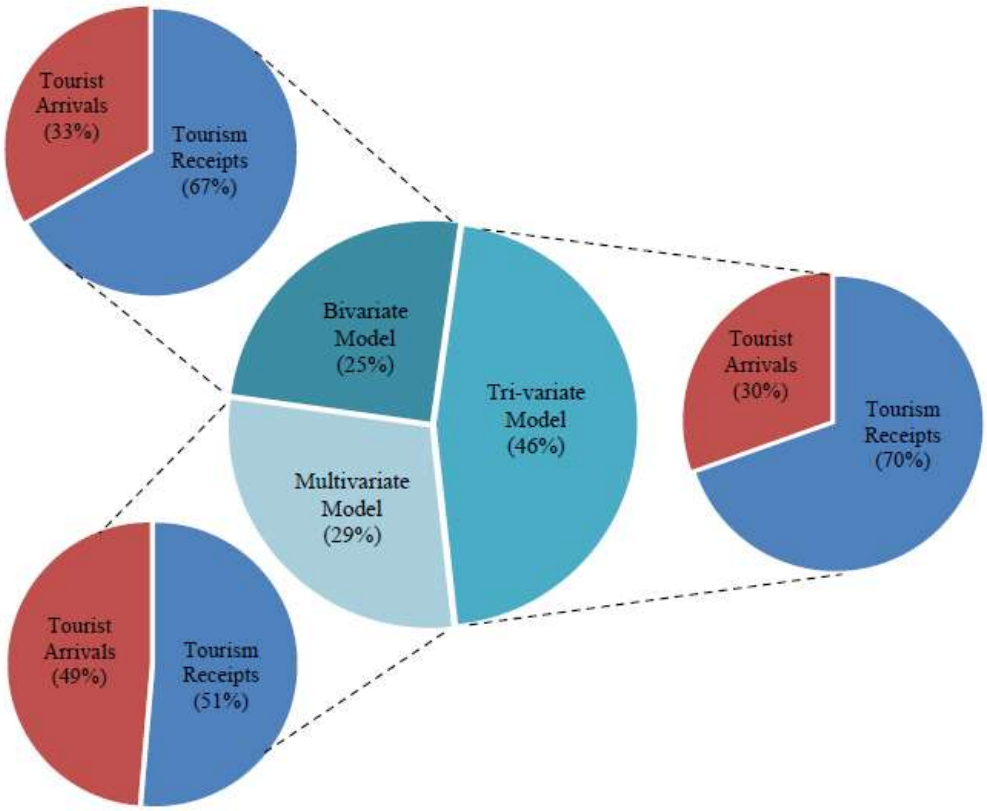


Figure 2.4: Classification of Studies by Model Specification

In terms of model popularity, most studies preferred to use tri-variate models that included the real exchange rate as an additional control variable to investigate the causality between tourism and economic growth. For instance, 46 per cent of the reviewed studies used a tri-variate model to investigate the causal relationship between tourism and economic growth, while 29 per cent of the studies applied the multivariate model. A plausible explanation for the high utilisation of real exchange rate as a variable in the tourism-growth studies was provided by Balaguer and Cantavella-Jordá's (2002) who assert that the inclusion of the real exchange rate into the model is designed

to not only deal with the omitted variable problem, but also to account for external competitiveness. Katircioğlu (2010a) added that exchange rate was a very important variable that influences international tourism and its relationship with economic growth. Moreover, from the perspective of data collection, exchange rate datasets are complete and easily obtainable through a variety of databases in various frequencies (e.g. annual, quarterly, monthly, weekly, and daily) compared to other potential variables. Apart from model specification, it was also observed that the number of international tourist arrivals and tourism receipts (earnings) are two common proxy variables for tourism activity. However, none of the studies used average length of stay or the number of nights spent at the visiting destination as a proxy variable for tourism activity, particularly in testing the tourism-growth nexus.

In the selection of a proxy variable for tourism, it was found that tourism receipts are more favoured as a proxy variable than the number of international tourist arrivals regardless of model specification used. In fact, more than 50 per cent of the studies used tourism receipts as a proxy variable for tourism to examine the causal relationship between tourism and economic growth. Akal (2004) showed that tourism receipts and the number of international tourist arrivals are highly correlated (i.e. 96 per cent). Hence, the selection of tourist arrivals or tourism receipts as a proxy variable is of no consequence in a tourism study. Oh (2005) claimed that tourism receipts provided a more accurate and reliable measure of tourism activity because it is a universally measured consistent index collected by national and international agencies, and the monetary transaction values are closely linked to gross domestic product (GDP).

Figure 2.5 summarises the methodologies used in tourism-growth studies. Throughout the literature, it was observed that the methodologies applied to analyse the relationship between tourism and economic growth varied in a number of ways. Generally, tourism-growth studies can be divided into two major groups. The first group of studies are based on a time series approach while the second group of studies are based on the cross-country or panel data approach. Granger causality is the main concept and method used by existing studies to examine the causal relationship between tourism and economic growth. However, Granger (1969) cautioned that Granger causality tests should be conducted using stationary variables. If the variables are non-stationary at level, Granger causality tests should be implemented using the first difference vector autoregressive (VAR) framework.

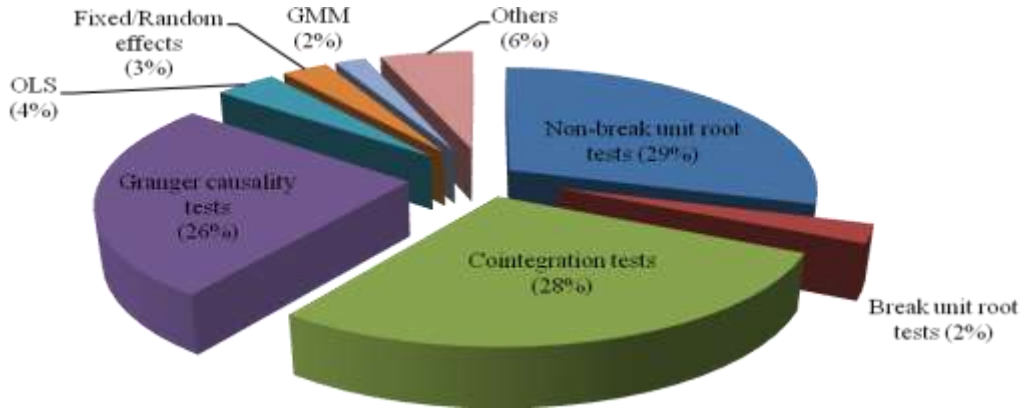


Figure 2.5: Classification of Studies by Methodologies

On the other hand, Engle and Granger (1987) and Granger (1988) noted that if the non-stationary variables shared a long-run common stochastic trend (i.e. cointegrated), there must be causation in at least one direction and the Granger causality tests should be performed within the vector error-correction model (VECM). Nevertheless, Masih and Masih (1998) contended that Granger causality is nothing more than a predictability test and meaningless if the variables are not cointegrated. Figure 2.5 reveals that studies

often applied the non-structural break unit root (29 per cent) and cointegration (28 per cent) tests alongside the Granger causality (26 per cent) test to investigate the causal relationship between tourism and economic growth. However, Perron (1989) argued that standard unit root tests are inappropriate when the series are confronted with structural breaks. Despite this imperfection, it was observed from previous literature that only 2 per cent of the reviewed studies investigated the plausibility of structural breaks in the unit root process (e.g. Chen and Chiou-Wei, 2009; Katircioğlu, 2009b, 2009c; Lee and Chien, 2008; Ozturk and Acaravci, 2009). As it can be seen from Table 2.1 and Table 2.2, existing studies on the tourism-growth nexus merely applied the one break unit root tests proposed by Perron (1990, 1997) and Zivot and Andrews (1992) to examine the order of integration of each series. Apart from that, a small portion of studies used the Ordinary Least Squares (OLS) estimator (4 per cent), fixed and random effect models (3 per cent), generalised method of moment (GMM) (2 per cent), and other econometric (6 per cent) approaches to ascertain the impact of tourism on economic growth.

2.4.2 Review of Findings

The causal relationship between tourism and economic growth has been well explored over the past decades. However, evidence of whether tourism-led growth or growth-led tourism remains unclear in the literature. The previous section highlighted the general characteristics and practices of previous tourism-growth studies. Here, the findings of previous empirical studies on the relationship between tourism and economic growth are reviewed. Table 2.3 provide an overview of the findings of 73 papers published in various peer-reviewed journals. It was observed that the causality results vary among model specification, income group as well as geography. In terms of model

specification, the literature review shows that studies with a bi-variate model were more likely to support the tourism-led growth hypothesis compared to those using tri-variate and multivariate models. Specifically, 84.2 per cent of studies using the bi-variate model proved the tourism-led growth hypothesis to be valid while only 69.1 per cent and 73.3 per cent of studies of the tri-variate and multivariate models respectively proved the hypothesis to be valid. The remaining 15.8 per cent, 30.9 per cent 26.7 per cent of the reviewed studies using the bi-variate, tri-variate and multivariate models rejected the tourism-led growth hypothesis.

Table 2.3: Overview of Findings of Studies on the Tourism-Growth Nexus

	Prove the TLG hypothesis		Reject the TLG hypothesis	
	Number of studies	Percentage of studies	Number of Studies	Percentage of studies
Model:				
Bi-variate	16	84.2%	3	15.8%
Tri-variate	38	69.1%	17	30.9%
Multivariate	11	73.3%	4	26.7%
Income group:				
High-income	23	76.7%	7	23.3%
Middle-income	38	76.0%	12	24.0%
Low-income	4	100.0%	–	–
Geographical:				
Americas	15	78.9%	4	21.1%
Africa	8	100.0%	–	–
Asia and the Pacific	21	61.8%	13	38.2%
Europe	24	92.3%	2	7.7%
Middle-East	6	100.0%	–	–

Note: The above calculation is based upon the findings from 73 reviewed papers.

From the perspective of income group, approximately 76 per cent of the studies that focused on the high-income and middle-income groups supported the tourism-led growth hypothesis. However, none of the studies that focused on the low-income group rejected the hypothesis, implying that tourism is a very important source of growth for

low-income countries. Although most of the studies focused on Asia and the Pacific region (i.e. 34 studies), the support rate for the tourism-led growth hypothesis is much lower than in the Americas (78.9 per cent), Africa (100 per cent), Europe (92.3 per cent), and Middle-East (100 per cent) regions. Furthermore, studies in Asia and the Pacific region showed the highest rejection rate of the tourism-led growth hypothesis compared to studies in other regions. Therefore, the validity of the tourism-led growth hypothesis among existing empirical literature remains ambiguous. In order to undertake an adequate review of the tourism-growth nexus, the studies were further separated into country-specific and multi-country studies. Table 2.1 summarises previous country-specific studies on the tourism-growth nexus while a summary of previous multi-country studies is outlined in Table 2.2. The summary is categorised according to author, research period, country, methodology and the major findings of causal effect.

The findings of country-specific studies in literature on the tourism-growth nexus were first analysed. The general conclusion that can be drawn from Table 2.1 is that the impact of tourism on economic growth is mixed. This is because some studies found that tourism expansion had a significantly positive impact on economic growth while others subscribed to the view that tourism expansion did not stimulate economic growth. Ghali (1976) conducted one of the earliest empirical studies on the tourism-growth nexus. The author employed the OLS estimator in the growth model to estimate the contribution of tourism to Hawaii's economic growth from 1953 to 1970. In order to estimate the effect of tourism growth on economic growth, the study disaggregated total exports into tourism receipts and other exports. The study found that the growth rate of income in Hawaii would continue without tourism growth, but the growth rate would be 14 per cent lower than that obtained with tourism growth. Based on this finding, the

author concluded that tourism growth could hasten Hawaii's economic growth, and this finding supported the tourism-led growth hypothesis. Using Ghali's (1976) model, Archer (1984) attempted to forecast the contribution of tourism on economic growth in Barbados from 1961 to 1977. The study discovered that 40 per cent of growth rates in per capita real GDP were attributable to tourism expansion. Therefore, the author concluded that tourism is an effective generator of economic growth in Barbados.

Only a handful of empirical studies tried to examine the tourism-growth nexus from the 1970s to 1990s. Nevertheless, many empirical studies on the causal relationship between tourism and economic growth have been published in the 21st century, particularly after the work of Balaguer and Cantavella-Jordá (2002) which sparked the interest of many researchers to look into the role of tourism in economic growth. Balaguer and Cantavella-Jordá (2002) examined the relationship between tourism, economic growth and the exchange rate for Spain from 1975:Q1 to 1997:Q1. They found that tourism was cointegrated with economic growth and the real exchange rate. In addition, the Granger causality results suggested a uni-directional causality running from tourism to economic growth. Thus, the tourism-led growth hypothesis was deemed valid with regard to the Spanish economy. Other studies such as Durbarry (2004), Gunduz and Hatemi-J (2005), Louca (2006), Brida, Carrera and Risso (2008), Brida et al. (2009), Lau, Oh and Hu (2009), Lee and Hung (2010), Belloumi (2010), Kreishan (2010), Katircioğlu (2010a, 2010b, 2011), Vanegas (2012), and Hye and Khan (2013) also found a uni-directional causality running from tourism to economic growth in Mauritius, Turkey, Cyprus, Mexico, Colombia, Malaysia, Singapore, Tunisia, Uruguay, Jordan, Pakistan and El Salvador.

Narayan and Prasad (2003) attempted to analyse the causal relationship between tourism and economic growth in Fiji using a bi-variate model. They found that the variables were cointegrated and there existed a bi-directional Granger causality between tourism and economic growth in Fiji. Dritsakis (2004) conducted a study to analyse the validity of the tourism-led growth hypothesis for Greece using a tri-variate framework (i.e., tourism, economic growth, and real exchange rate) from 1960:Q1 to 2000:Q4. The study showed that the variables were cointegrated and there was a reciprocal causal relationship between tourism and economic growth in Greece. Coincidentally, a number of studies also found similar conclusions with regard to Turkey, Taiwan, Malaysia, Pakistan, Spain, Malta, and Lebanon (e.g. Katircioğlu, 2009b; Khalil, Kakar and Waliullah, 2007; Kim, Chen and Jang, 2006; Lean and Tang, 2010; Lee and Chien, 2008; Nowak, Sahli and Cortés-Jiménez, 2007; Ongan and Demiröz, 2005; Tang and Abosedra, 2012). In summary, the findings of these studies supported the tourism-led growth hypothesis.

On the other hand, Oh (2005) examined the validity of the tourism-led growth hypothesis for Korea with a bi-variate model (i.e. tourism and economic growth). Contrary to the findings presented above, the study demonstrated that tourism and economic growth were not cointegrated in the case of Korea. Thus, the author used the first difference VAR system to ascertain the causal relationship between the variables. The Granger causality test results showed that tourism does not Granger-cause economic growth, but economic growth Granger-causes tourism. With this finding, he surmised that the tourism-led growth hypothesis was not valid, and that tourism development in Korea was heavily dependent on its economic growth and development. Tang and Jang (2009) examined the causality between gross domestic product (GDP) in the United States with respect to major tourism-related industries (i.e. airlines, casinos,

hotels, and restaurants). They found that only airlines and GDP were cointegrated, and the direction of causality ran from GDP to tourism rather than in the opposite direction. In line with the findings of Oh (2005), they also found some support for the growth-driven tourism hypothesis based upon the United States' sub-industry level data. Likewise, Nanthakumar, Ibrahim and Harun (2008) and Kadir, Nayan and Abdullah (2010) for Malaysia, Katircioğlu (2009c) for Cyprus, Malik et al. (2010) for Pakistan, Payne and Mervar (2010) for Croatia, Wang (2010) for China, Lee (2012) for Singapore, and Kumar and Kumar (2012) for Fiji also found evidence of a uni-directional Granger causality running from economic growth to tourism. The findings of these studies imply that the tourism-led growth hypothesis was invalid. Moreover, other studies also rejected the tourism-led growth hypothesis as they found that tourism and economic growth did not Granger-cause each other. Among them include Katircioğlu (2009a) and Ozturk and Acaravci (2009) for Turkey, Brida, Punzo and Risso (2011) for Brazil, Ghosh (2011) and Misha, Rout and Mohapatra (2011) for India.

The second group of literature focused on multi-country studies. The results were not much different from the country-specific studies as Table 2.2 exhibits that the causal relationship between tourism and economic growth in multi-country studies was also unclear. For instance, Modeste (1995) employed the two-sector growth model proposed by Feder (1983) to assess the contribution of tourism on economic growth in 3 Caribbean countries (i.e. Antigua and Barbuda, Barbados and Anguilla). He found that tourism had a significant positive effect on economic growth in the 3 Caribbean countries he studied. Gökovali and Bahar (2006) examined the effect of tourism on economic growth in 13 Mediterranean countries using three different panel data approaches. The estimation results of pooled OLS, fixed and random effect models consistently showed that tourism had a positive effect on economic growth. Therefore,

they concluded that tourism constituted a source of growth for the 13 Mediterranean countries analysed. Likewise, Fayissa, Nsiah and Tadasse (2008; 2011), Proença and Soukiazis (2008), Adamou and Clerides (2010), Brida, Punzo and Risso (2011), and Tiwari (2011) also concluded that tourism expansion enhanced economic growth.

Lee and Chang (2008) attempted to take into account the effect of heterogeneity in the relationship between tourism and economic growth. For this reason, they employed the heterogeneous panel cointegration tests proposed by Pedroni (1999) and the panel Granger causality tests to examine the relationship between tourism and economic growth in both OECD and non-OECD countries. They highlighted that tourism and economic growth were cointegrated in OECD and non-OECD countries. Nonetheless, the cointegration evidence was found to be rather weak when they further disaggregated the non-OECD countries into sub-regions such as Asia, Latin America and Sub-Sahara Africa. On the causal relationship between tourism and economic growth, they found that there was a uni-directional Granger causality running from tourism to economic growth in the OECD and Asia countries. However, they found that there was a bi-directional Granger causality for non-OECD, Latin America and Sub-Saharan Africa countries.

Using the same methodology, Narayan et al. (2010) assessed the causal relationship between tourism and economic growth in 4 Pacific Island countries (i.e. Fiji, Tonga, Solomon Islands and Papua New Guinea) from 1988 to 2004. Similar to Lee and Chang (2008), they also found strong evidence of cointegration. In addition, tourism and economic growth in these 4 Pacific Island countries Granger-caused each other. Chen and Chiou-Wei (2009) applied the exponential GARCH in mean (i.e. EGARCH-M) approach to analyse the relationship between tourism expansion and economic growth

in Taiwan and Korea. In doing so, they analysed the causal relationship between tourism and economic growth, and the effect of uncertainty on the two variables of interest. Unlike Kim, Chen and Jang (2006) and Lee and Chien (2008), they found evidence of a uni-directional causality running from tourism to economic growth in Taiwan. Furthermore, they also found that tourism and economic growth exhibited a bi-directional causality in Korea. The result for Korea was inconsistent with the findings of Oh (2005). With respect to this, Chen and Chiou-Wei (2009) explained that the contrary results may be attributable to the introduction of other factors such as risk and real exchange rate into the model.

Sarmidi and Salleh (2011) analysed the causal relationship between Malaysia's economic growth and selected four ASEAN tourism partners (i.e. Singapore, Thailand, Indonesia and Brunei) using the bound testing approach to cointegration and the Granger causality test. They found that Malaysia's economic growth was cointegrated with the selected tourism partners. However, the direction of causality between economic growth and tourism varied among tourism partners. They found a uni-directional causality running from Malaysia's economic growth to tourist arrivals from Singapore and Brunei. There was also a uni-directional causality running from tourist arrivals from Indonesia to Malaysia's economic growth. Finally, they detected that tourist arrivals from Thailand and Malaysia's economic growth exhibited bi-directional causality. Based on these varied findings, they postulated that tourist arrivals from different tourist generating destination may have different implications to economic growth in Malaysia.

Othman, Salleh and Sarmidi (2012) attempted to investigate the validity of the tourism-led growth hypothesis in Austria, Canada, China, French, Germany, Greece, Hong Kong (China), Italy, Malaysia, Mexico, Portugal, Spain, Thailand, Turkey, the United Kingdom, the United States, Netherland, and Singapore. They employed the bounds testing approach to cointegration and the Granger causality technique to achieve the objective of their study. Generally, they detected cointegration to exist in all countries under investigation. Nevertheless, the directions of Granger causality were inconsistent among countries. For example, 10 out of 18 countries (e.g. Austria, Canada, French, Germany, Italy, Malaysia, Turkey, the United Kingdom, the Netherlands and Singapore) supported the tourism-led growth hypothesis, while the rest (e.g. China, Greece, Hong Kong, Mexico, Portugal, Spain, Thailand, and the United States) rejected the tourism-led growth hypothesis.

2.4.3 Conceptual Framework: Tourism-Growth Nexus

As presented in the earlier chapter, one of the objectives of the present study is to investigate the validity of the tourism-led growth hypothesis. This sub-section proposes to reveal the conceptual framework uses to understand and analyse how tourism expansion can stimulate economic growth of a country. In addition, this conceptual framework will be used to formulate the empirical model of this study in order to examine the nexus between tourism and economic growth. Based upon the literature review, the conceptual framework for the tourism-growth nexus is illustrated in Figure 2.6. The arrows in Figure 2.6 indicate the direction of interaction between tourism, exchange rate, and economic growth.

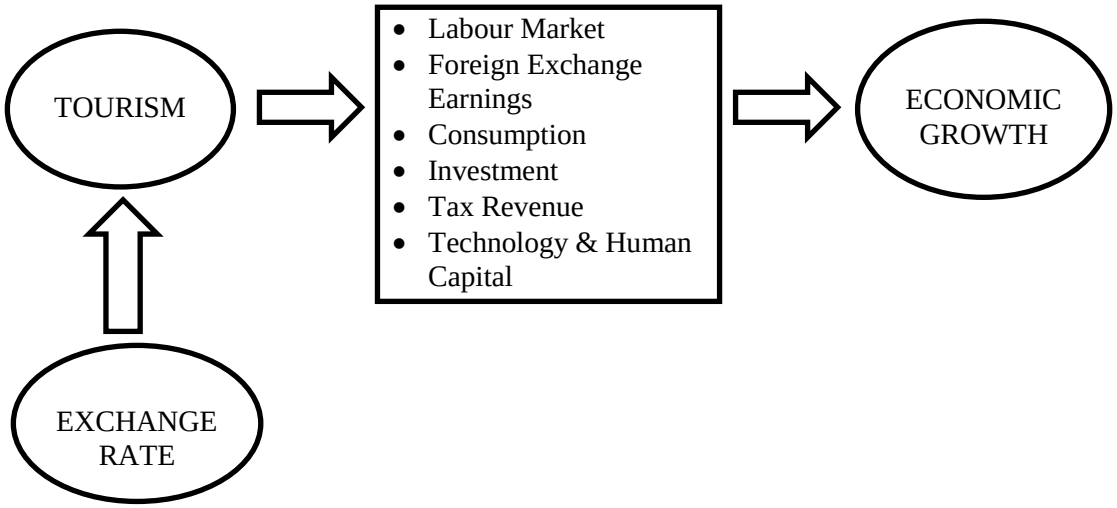


Figure 2.6: The Impact of Tourism on Economic Growth

Based upon the conceptual framework presented in Figure 2.6, exchange rate is an important element that affects tourism demand that subsequently influences economic growth of a country. For example, a depreciation of the Malaysian currency will attract international tourist arrivals because the currency depreciation makes the cost of living in Malaysia cheaper. Consequently, tourism demand increases and thus affects the process of economic growth. Tourism would be able to affect economic growth of a country through its impact on (a) the labour market through the creation of more employment opportunities; (b) foreign exchange earnings by facilitating payment for imported capital goods or basic input used in the production process; (c) the consumption of goods and services such as transportation, hotel and restaurant; (d) investment in new infrastructure; (e) tax revenues such as incomes tax generated by tourism employment and business as well as taxes and duties levied on goods and services supplied to tourists; (f) technology diffusion and accumulation of human capital. Therefore, it is obvious that tourism can promote economic growth of a country, and this is known as the tourism-led growth hypothesis.

2.5 Theoretical Framework: Demand for Tourism

This section will elaborate upon the features of demand for tourism.

2.5.1 Theory of Consumer Behaviour

Decision-making on demand for tourism, also known as tourism demand, is similar to decision-making in consumption as both are generally reliant on consumers' (tourists') preferences and their budget constraints (Sinclair and Stabler, 1997). Generally, it is assumed that rational consumers will try to maximise their utility with available resources (i.e. income). Therefore, consumers' choice can be framed as a *utility maximisation problem* subject to a budget constraint (Mas-Colell, Whinston and Green, 1995) and the theory of consumer behaviour will be employed to explain the tourist's decision-making process. Assuming that there are two tourism destinations Q_1 and Q_2, the utility function and the budget constraint for these destinations are given as:

Utility function:

$$U(Q) = \max(Q_1, Q_2) = Q_1 Q_2 \tag{2.10}$$

Budget constraint function:

$$P_1 Q_1 + P_2 Q_2 = Y \tag{2.11}$$

where Y is income, P_1 and P_2 are the price of tourism for destination 1 and 2, respectively. Based on the above functions, optimal choice can be obtained by solving the following Lagrange multiplier problem:

$$\Phi = Q_1 Q_2 + \lambda\left(Y - P_1 Q_1 - P_2 Q_2\right)$$

$$\frac{\partial \Phi}{\partial Q_1} = Q_2 - \lambda P_1 = 0$$

$$\frac{\partial \Phi}{\partial Q_2} = Q_1 - \lambda P_2 = 0$$

$$\frac{\partial \Phi}{\partial \lambda} = Y - P_1 Q_1 - P_2 Q_2 = 0$$

Then, the demand function for tourism can be expressed accordingly as:

$$Q_1 = f\left(Y, P_1, P_2\right) \tag{2.12}$$

$$Q_2 = f\left(Y, P_1, P_2\right) \tag{2.13}$$

where Q is the quantity of demand for tourism, Y is the income level, P_1 and P_2 are the prices of tourism for destination 1 and destination 2, respectively. Apart from income and prices, Lim (1997), Sinclair and Stabler (1997), Sinclair (1998), Önder, Candemir, Kumral (2009), and Song, Witt and Li (2009) documented that tourism demand may also be influenced by other factors. Therefore, the general function for tourism demand can be expressed as:

$$Q_{ij} = f\left(Y_j, P_i, P_j, Z\right) \tag{2.14}$$

Alternatively, when homogeneity is assumed, the demand function for tourism can also be specified as a function of real income and relative price of tourism as below:

$$Q_{ij} = f\left(\frac{Y_j}{P_j}, \frac{P_i}{P_j}, Z\right) \tag{2.15}$$

where Q_{ij} is the quantity of demand for tourism in destination *i* by tourist from origin country *j*; Y_j is the income level of the origin country *j*; P_i is the price of tourism in the visiting destination *i*; P_j is the price of other goods and services in the origin country *j*; Z is a vector of other factors affecting the demand for tourism.

2.6 Literature Review: Demand for Tourism

Since one of the objectives of this thesis is to model the demand for tourism, it is also essential to provide a critical review of tourism demand literature. In this section, the literature survey of previous empirical studies on the demand for tourism is elaborated upon. 61 relevant published articles in the peer-reviewed journals from 1970 to 2012 were reviewed. Many empirical studies were conducted to model the demand for tourism with different econometric methods, data, variables, and on different countries. Table 2.4 to 2.6 summarise the methods of earlier tourism demand studies.

Table 2.4: Dependent Variables, Data Frequency and Data Type

No.	Authors	Dependent variables				Data Frequency			Data Type		
		1	2	3	4	1	2	3	1	2	3
1.	Artus (1970)	✓				✓			✓		
2.	Artus (1972)	✓				✓			✓		
3.	Kwack (1972)	✓					✓		✓		
4.	Askari (1973)	✓	✓		✓	✓			✓		
5.	Diamond (1977)		✓			✓				✓	✓
6.	Fujii and Mak (1981)		✓			✓			✓		
7.	Kliman (1981)		✓			✓			✓		✓
8.	Loeb (1982)	✓				✓			✓		
9.	Truett and Truett (1982)		✓			✓			✓		
10.	Gunadhi and Boey (1986)		✓			✓			✓		
11.	Chadee and Mieczkowski (1987)	✓	✓				✓		✓		
12.	Martin and Witt (1987)		✓			✓			✓		
13.	Truett and Truett (1987)	✓				✓			✓		
14.	Witt and Martin (1987)		✓			✓			✓		
15.	Martin and Witt (1988)		✓			✓			✓		
16.	Anastasopoulos (1989)	✓				✓			✓		
17.	Var, Mohammad and Icoz (1990a)		✓			✓			✓		
18.	Var, Mohammad and Icoz (1990b)		✓			✓				✓	
19.	Crouch, Schultz and Valerio (1992)		✓			✓			✓		
20.	Qiu and Zhang (1995)	✓	✓			✓			✓		
21.	Lee, Var and Blaine (1996)	✓				✓			✓		
22.	Seddighi and Shearing (1997)	✓					✓		✓		
23.	Hiemstra and Wong (2002)		✓			✓			✓		
24.	Lim and McAleer (2002)		✓			✓			✓		
25.	Lise and Tol (2002)		✓			✓					✓
26.	Tan, McCahon and Miller (2002)		✓			✓					✓
27.	Song, Wong and Chon (2003)		✓			✓			✓		
28.	Song, Witt and Jensen (2003)		✓			✓			✓		
29.	Song, Witt and Li (2003)		✓			✓			✓		
30.	Narayan (2004)		✓			✓			✓		
31.	Croes and Vanegas (2005)		✓			✓			✓		
32.	Hamilton, Maddison and Tol (2005b)		✓			✓				✓	
33.	Hamilton, Maddison and Tol (2005a)		✓			✓				✓	
34.	Algieri (2006)	✓						✓	✓		
35.	Garín-Muñoz (2006)			✓		✓					✓
36.	Toh, Khan and Goh (2006)		✓			✓			✓		
37.	Garín-Muñoz (2007)			✓		✓					✓
38.	Garín-Muñoz and Montero-Martín (2007)		✓			✓					✓

(Continue)

(Continue) Table 2.4: Dependent Variables, Data Frequency and Data Type

No.	Authors	Dependent variables				Data Frequency			Data Type		
		1	2	3	4	1	2	3	1	2	3
39.	Salleh, Othmand and Ramachandran (2007)		✓			✓			✓		
40.	Choyakh (2008)			✓		✓			✓		
41.	Kadir, Abdullah and Nayan (2008)		✓			✓					✓
43.	Salleh et al. (2008)		✓			✓			✓		
44.	Durbarry, Nicolas and Seetanah (2009)		✓			✓					✓
45.	Kadir and Karim (2009)		✓				✓		✓		
46.	Önder, Candemir and Kumral (2009)		✓			✓			✓		
47.	Wang (2009)		✓				✓		✓		
48.	Arsad and Johor (2010)		✓					✓	✓		
49.	Bankole and Babatunde (2010)		✓				✓		✓		
50.	Fernandes and Karvik (2010)		✓			✓					✓
51.	Görmüs and Göçer (2010)		✓			✓					✓
52.	Hanafiah and Harun (2010)		✓			✓					✓
53.	Salleh et al. (2010)		✓			✓					✓
54.	Seetanah (2010)		✓			✓					✓
55.	Song et al. (2010)	✓	✓			✓			✓		
56.	Wang (2010)		✓			✓			✓		
57.	González-Gómez, Álvarez-Díaz and Otero-Giráldez (2011)			✓				✓	✓		
58.	Salleh, Cheah and Othman (2011)		✓			✓			✓		
59.	Zaman, Khan and Ahmad (2011)	✓				✓			✓		
60.	Massidda and Etzo (2012)		✓	✓		✓					✓
61.	Onafowora and Owoye (2012)		✓			✓			✓		
	Number of studies	**14**	**47**	**5**	**1**	**51**	**7**	**3**	**44**	**4**	**15**
	Percentage of studies (%)	**23**	**77**	**8**	**2**	**84**	**11**	**5**	**72**	**7**	**25**

Note: Dependent variables: (1) Tourism receipts/expenditure, (2) Tourists arrival/departure, (3) Number of nights, (4) Average length of stay
Time Interval: (1) Annual, (2) Quarterly, (3) Monthly
Data Type: (1) Time series, (2) Cross-sectional, (3) Pooled / Panel

Table 2.5: Independent / Explanatory Variables

No.	Authors	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Artus (1970)	✓		✓					✓					
2.	Artus (1972)	✓	✓		✓				✓					
3.	Kwack (1972)	✓	✓							✓			✓	
4.	Askari (1973)	✓			✓	✓			✓					✓
5.	Diamond (1977)	✓				✓		✓						
6.	Fujii and Mak (1981)	✓				✓	✓							
7.	Kliman (1981)	✓	✓			✓	✓	✓						✓
8.	Loeb (1982)	✓	✓		✓								✓	
9.	Truett and Truett (1982)	✓	✓	✓						✓				
10.	Gunadhi and Boey (1986)	✓	✓		✓								✓	
11.	Chadee and Mieczkowski (1987)	✓	✓	✓	✓			✓					✓	
12.	Martin and Witt (1987)	✓	✓	✓	✓	✓	✓		✓				✓	
13.	Truett and Truett (1987)	✓		✓	✓					✓				
14.	Witt and Martin (1987)	✓	✓		✓	✓	✓		✓				✓	
15.	Martin and Witt (1988)	✓	✓	✓	✓	✓			✓				✓	
16.	Anastasopoulos (1989)	✓	✓	✓	✓									
17.	Var, Mohammad and Icoz (1990b)	✓			✓	✓								
18.	Var, Mohammad and Icoz (1990a)	✓				✓		✓						
19.	Crouch, Schultz and Valerio (1992)	✓	✓			✓			✓	✓			✓	
20.	Qiu and Zhang (1995)	✓	✓		✓	✓			✓	✓	✓		✓	
21.	Lee, Var and Blaine (1996)	✓	✓		✓								✓	
22.	Seddighi and Shearing (1997)	✓	✓	✓										
23.	Hiemstra and Wong (2002)	✓	✓	✓	✓	✓	✓	✓					✓	✓
24.	Lim and McAleer (2002)	✓	✓		✓	✓								
25.	Lise and Tol (2002)	✓							✓	✓		✓	✓	✓
26.	Tan, McCahon and Miller (2002)	✓			✓				✓				✓	
27.	Song, Wong and Chon (2003)	✓	✓	✓									✓	
28.	Song, Witt and Jensen (2003)	✓	✓	✓					✓				✓	
29.	Song, Witt and Li (2003)	✓	✓	✓						✓			✓	
30.	Narayan (2004)	✓	✓	✓		✓							✓	
31.	Croes and Vanegas (2005)	✓	✓		✓		✓						✓	
32.	Hamilton, Maddison and Tol (2005b)	✓						✓				✓		
33.	Hamilton, Maddison and Tol (2005a)	✓						✓				✓		
34.	Algieri (2006)	✓	✓			✓			✓					
35.	Garín-Muñoz (2006)	✓	✓			✓	✓		✓				✓	
36.	Toh, Khan and Goh (2006)	✓	✓		✓								✓	
37.	Garín-Muñoz (2007)	✓	✓			✓	✓						✓	
38.	Garín-Muñoz and Montero-Martín (2007)	✓	✓			✓	✓		✓				✓	

(Continue)

(Continue) Table 2.5: Independent / Explanatory Variables

No.	Authors	1	2	3	4	5	6	7	8	9	10	11	12	13
39.	Salleh, Othmand and Ramachandran (2007)	✓	✓	✓	✓	✓							✓	
40.	Choyakh (2008)	✓	✓	✓						✓			✓	
41.	Kadir, Abdullah and Nayan (2008)	✓	✓	✓									✓	
42.	Ouerfelli (2008)	✓	✓	✓	✓					✓				
43.	Salleh et al. (2008)	✓	✓	✓	✓	✓							✓	
44.	Durbarry, Nicolas and Seetanah (2009)	✓	✓	✓						✓			✓	
45.	Kadir and Karim (2009)	✓	✓	✓									✓	
46.	Önder, Candemir and Kumral (2009)	✓	✓			✓				✓				
47.	Wang (2009)	✓	✓		✓	✓	✓						✓	
48.	Arsad and Johor (2010)		✓	✓		✓	✓							
49.	Bankole and Babatunde (2010)	✓	✓			✓							✓	
50.	Fernandes and Karvik (2010)	✓	✓										✓	
51.	Görmüs and Göçer (2010)	✓	✓	✓	✓	✓		✓		✓			✓	
52.	Hanafiah and Harun (2010)	✓	✓		✓	✓		✓					✓	
53.	Salleh et al. (2010)	✓	✓	✓			✓						✓	
54.	Seetanah (2010)	✓	✓	✓		✓				✓			✓	
55.	Song et al. (2010)	✓	✓	✓									✓	
56.	Wang (2010)	✓				✓							✓	
57.	González-Gómez, Álvarez-Díaz and Otero-Giráldez (2011)	✓	✓										✓	
58.	Salleh, Cheah and Othman (2011)	✓	✓			✓							✓	
59.	Zaman, Khan and Ahmad (2011)											✓		
60.	Massidda and Etzo (2012)	✓	✓			✓	✓	✓		✓	✓	✓	✓	
61.	Onafowora and Owoye (2012)	✓	✓			✓	✓						✓	
	Number of studies	**59**	**47**	**25**	**24**	**31**	**14**	**10**	**14**	**14**	**2**	**5**	**41**	**4**
	Percentage of studies (%)	**97**	**79**	**41**	**40**	**51**	**23**	**16**	**23**	**23**	**3**	**8**	**67**	**7**

Note: (1) Income, (2) Own price of tourism, (3) Substitution price of tourism, (4) Exchange rate (separate from prices of tourism), (5) Cost of transportation, (6) Lagged dependent variable (Word-of-mouth effect), (7) Population, (8) Time-trend, (9) Supply factors, (10) Safety and security factors, (11) Environmental factors, (12) Qualitative factors (dummy variables), (13) Other factors

Table 2.6: Methodologies

No.	Authors	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Artus (1970)	✓												
2.	Artus (1972)	✓												
3.	Kwack (1972)	✓												
4.	Askari (1973)	✓	✓											
5.	Diamond (1977)	✓												
6.	Fujii and Mak (1981)	✓		✓	✓									
7.	Kliman (1981)	✓												
8.	Loeb (1982)	✓		✓										
9.	Truett and Truett (1982)	✓												
10.	Gunadhi and Boey (1986)	✓												
11.	Chadee and Mieczkowski (1987)	✓												
12.	Martin and Witt (1987)	✓		✓										
13.	Truett and Truett (1987)	✓												
14.	Witt and Martin (1987)	✓		✓										
15.	Martin and Witt (1988)	✓		✓										
16.	Anastasopoulos (1989)	✓												
17.	Var, Mohammad and Icoz (1990b)	✓												
18.	Var, Mohammad and Icoz (1990a)	✓												
19.	Crouch, Schultz and Valerio (1992)	✓												
20.	Qiu and Zhang (1995)	✓												
21.	Lee, Var and Blaine (1996)	✓		✓										
22.	Seddighi and Shearing (1997)						✓							
23.	Hiemstra and Wong (2002)									✓				
24.	Lim and McAleer (2002)						✓							
25.	Lise and Tol (2002)	✓												
26.	Tan, McCahon and Miller (2002)	✓		✓										
27.	Song, Wong and Chon (2003)									✓				
28.	Song, Witt and Jensen (2003)	✓								✓	✓	✓	✓	
29.	Song, Witt and Li (2003)									✓	✓			
30.	Narayan (2004)						✓							
31.	Croes and Vanegas (2005)	✓		✓										
32.	Hamilton, Maddison and Tol (2005b)	✓												✓
33.	Hamilton, Maddison and Tol (2005a)	✓												✓
34.	Algieri (2006)						✓							
35.	Garín-Muñoz (2006)					✓								
36.	Toh, Khan and Goh (2006)					✓								
37.	Garín-Muñoz (2007)					✓								
38.	Garín-Muñoz and Montero-Martín (2007)					✓								

(Continue)

(Continue) Table 2.6: Methodologies

No.	Authors	1	2	3	4	5	6	7	8	9	10	11	12	13
39.	Salleh, Othman and Ramachandran (2007)						✓							
40.	Choyakh (2008)						✓							
41.	Kadir, Abdullah and Nayan (2008)							✓						
42.	Ouerfelli (2008)						✓							
43.	Salleh et al. (2008)						✓							
44.	Durbarry, Nicolas and Seetanah (2009)						✓	✓						
45.	Kadir and Karim (2009)						✓							
46.	Önder, Candemir and Kumral (2009)	✓												
47.	Wang (2009)						✓							
48.	Arsad and Johor (2010)						✓							
49.	Bankole and Babatunde (2010)						✓							
50.	Fernandes and Karvik (2010)						✓	✓						
51.	Görmüs and Göçer (2010)							✓						
52.	Hanafiah and Harun (2010)								✓					
53.	Salleh et al. (2010)							✓						
54.	Seetanah (2010)						✓							
55.	Song et al. (2010)									✓				
56.	Wang (2010)						✓							
57.	González-Gómez, Álvarez-Díaz and Otero-Giráldez (2011)						✓							
58.	Salleh, Cheah and Othman (2011)						✓							
59.	Zaman, Khan and Ahmad (2011)						✓							
60.	Massidda and Etzo (2012)					✓								
61.	Onafowora and Owoye (2012)						✓							
	Number of studies	**28**	**1**	**8**	**1**	**5**	**20**	**5**	**1**	**5**	**2**	**1**	**1**	**2**
	Percentage of studies (%)	**46**	**2**	**13**	**2**	**8**	**33**	**8**	**2**	**8**	**3**	**2**	**2**	**3**

Note: (1) Ordinary Least Squares (OLS) multiple regression, (2) Maximum Likelihood Estimation (MLE), (3) Multiple regression using the Cochrane-Orcutt procedure (or Generalised Least Squares, GLS), (4) Ridge regression, (5) GMM estimator, (6) Cointegration approach, (7) Fixed and Random effects model, (8) Gravity regression model, (9) Autoregressive Distributed Lag Model (ADLM), (10) Error-correction model (ECM), (11) Unrestricted Vector Autoregressive (VAR) model, (12) Time-Varying Parameter (TVP) approach, and (13) Others

2.6.1 Review of Studies Based on Variables in a Model and Methodologies

This section will delineate the variables used in a tourism demand model.

2.6.1.1 Dependent Variables

A survey of tourism economic literatures revealed that the number of international tourist arrivals, and the tourism receipts were two frequently used indicators to measure international tourism demand (Song, Witt and Li, 2009). Alternatively, some studies (e.g. Askari, 1973; Garín-Muñoz, 2006; Choyakh, 2008; Massidda and Etzo, 2012) used the length-of-stay as a proxy for international tourism demand where length-of-stay refers to the number of nights spent at a tourist accommodation in the visiting destination. Crouch (1994b) revealed that 64 per cent of studies examining demand for tourism used the number of tourist arrivals as a proxy for tourism while 50 per cent of the studies used tourism receipts. However, only a few studies used the number of nights and/or average length-of-stay in this aspect. Lim (1997) noted that a very large portion of the reviewed studies employed tourist arrivals and/or tourism receipts to measure international tourism demand. Nevertheless, very few of them used other proxies such as travel export-import and average length-of-stay to examine the demand for international tourism.

In our literature survey of 61 relevant articles on the demand for tourism from 1970 to 2012, it was observed that most of the reviewed empirical studies employed tourist arrivals to measure international demand for tourism. Table 2.4 reveals that approximately 77 per cent of the studies employed tourist arrivals as the dependent variable when modelling the demand for tourism. In contrast, approximately 23 per cent

of the studies applied tourism receipts as the dependent variable to study the demand for tourism. Finally, approximately 10 per cent of the studies used either number of nights or average length-of-stay as the dependent variable. These results are quite similar to that of Crouch (1994b) and Lim (1997) who both asserted that the majority of tourism demand studies used tourist arrivals to measure international demand for tourism. The theory of consumer behaviour defines that demand is the quantity of a good and/or service that a consumer is willing and able to purchase at a given condition. This theory also stipulates that the demand variable refer to the quantity of the product demanded. Therefore, it is natural to observe that the number of international tourist arrivals has been extensively used to measure international tourism demand. In addition, it is also the most ideal dependent variable to measure international tourism demand.

2.6.1.2 Explanatory Variables

Modelling the demand for tourism is a not new area of exploration in tourism economic literature. In fact, over the past decades, many potential explanatory variables have been suggested as a means to understand tourism demand behaviour. The explanatory variables are summarised in Table 2.5. Tourism stakeholders and policymakers have continuously strived to understand factors that explain tourism demand behaviour because business and management failures are largely attributed to failures in understanding market demand behaviour (Song, Witt and Li, 2009). The theory of consumer behaviour postulates that income and price are two most important explanatory variables affecting a consumer's purchasing decision. The literature survey conducted in this study revealed that income (97 per cent), own price (77 per cent), substitute price (41 per cent), exchange rate (41 per cent) and the cost of transportation (51 per cent) were the common explanatory variables used in the research on tourism

demand. However, not all explanatory variables can be quantified. Therefore, a number of studies have attempted to capture the effect of non-quantifiable factors that impact on tourism demand behaviour via the use of dummy variables. Table 2.5 reveals that about 67 per cent of studies accommodated dummy variables into the tourism demand model to capture disturbances or qualitative factors that might affect a tourist's decision. Examples of these qualitative factors include economic crisis, terrorism, special events, political factors, health factors, environmental factors and other non-quantifiable qualitative factors. Apart from that, 23 per cent of the studies, particularly those using time series data inserted the time trend and/or lagged dependent variables into the tourism demand model to examine changes in travel taste and/or the word-of-mouth effect. Moreover, some of the studies (e.g. Garín-Muñoz, 2006, 2007; Garín-Muñoz and Montero-Martín, 2007; Onafowora and Owoye, 2012; Song, Wong and Chon, 2003; Wang, 2009; Witt and Martin, 1987) included the lagged dependent variable to estimate short and long-run tourism demand elasticities. Of the many potential variables that have been tested, the effect of safety and security (e.g. crime), environment (e.g. whether, climate or pollution), and education (e.g. quality of education) on the demand for tourism received least attention. In fact, to the best of our knowledge, less than 10 per cent of studies have considered these factors in estimating tourism demand (see Table 2.5).

2.6.1.3 Methodologies

Table 2.4 shows that the majority of studies applied annual time series data to analyse demand for tourism. In fact, approximately 84 per cent of the studies used annual data, while the rest used either quarterly (11 per cent) or monthly (5 per cent) data to estimate the demand elasticities of tourism.

Alternatively, some previous studies used more than one type of data to estimate tourism demand. Time series, cross-sectional and panel data were the three types of data used in these studies. The literature review revealed that 72 per cent of the studies used time series data, while approximately 25 per cent of the studies used panel data to investigate the demand for tourism. However, only a few studies used cross-sectional data to analyse the demand behaviour of tourism.

Many tourism demand studies have been performed using different methodologies to estimate the demand function for tourism. Table 2.6 reveals that studies conducted prior to 1997 are more likely to estimate tourism demand elasticities using traditional econometric approaches without considering the unit root and cointegration properties. This raises issues pertaining to the validity of the findings as Yule (1926) and Granger and Newbold (1974) noted that regression results using non-stationary variables often yield spurious results and as such, statistical inferences reliant on such spurious data are misleading. In this regard, Nelson and Plosser (1982) observed that almost all macroeconomic time series data are non-stationary at level, but are stationary after first difference. Therefore, studies that estimated the regression using first difference variables have tended to avoid the spurious regression problem. However, Engle and Granger (1987) contended that when the variables were found to be cointegrated, regression results based on first difference variables may have missed the long-run information and also failed to encounter the error-correction mechanism. Moreover, Kulendran and Witt (2001) suggested that the cointegration approach substantially enhanced forecasting accuracy in tourism demand compared to the OLS regression approach. Consequently, testing for unit root and cointegration properties has been deemed essential and complementary in econometric modelling. Due to this, the

cointegration concept and method have gained popularity in the tourism demand studies from the mid-1990s until onward.

Among the many econometric methods employed to examine the demand for tourism, the OLS multiple regression method (46 per cent), the multiple regression using the Cochrance-Orcutt procedure (13 per cent) and the cointegration approach (33 per cent) were the most popular methods. However, most studies based on OLS multiple regressions and Cochrance-Orcutt procedure appeared prior to 1997. Artus (1970, 1972), Askari (1973), Kliman (Kliman, 1981), Loeb (1982), Truett and Truett (1987; 1982), Chadee and Mieczkowski (1987), Martin and Witt (1987, 1988) and Var, Mohammad and Icoz (1990a, 1990b), Crouch, Schultz and Valerio (1992) and Lee, Var and Blaine (1996) are good examples of such studies. In contrast, a majority of the post-1997 studies employed the cointegration approach to examine the demand for tourism. From Table 2.6, Seddighi and Shearing (1997), Lim and McAleer (2002), Kim and Song (1998), Narayan (2004), Salleh, Othman and Ramachandran (2007), Ouerfelli (2008), Wang (2009), and Onafowora and Owoye (2012) are some examples of studies that used the cointegration approach to investigate the demand for tourism. It should be noted that apart from the above methods, 8 per cent of the studies employed the GMM estimator, fixed and random effects model, and the autoregressive distributed lag model (ADLM) to estimate demand for tourism. Econometric methods that have been the subject of minor interest include maximum likelihood estimation (MLE), ridge regression, the gravity regression model, unrestricted VAR, and the time-varying parameter (TVP) approach. Less than 5 per cent of the studies employed the above econometric methods to estimate the tourism demand model.

2.6.2 Review of Findings: Determinants of Tourism Demand

This section will elaborate on the determinants of tourism demand.

2.6.2.1 Income

A review of the existing tourism economics literature and the theory of consumer behaviour indicated that income is one of the most important determinants of tourism demand. Archer (1980) documented that most tourism demand can be explained by income. Usually the income level of the origin country will be included in the tourism demand function. This is the *push factor* that drives a tourist's decision to demand for international tourism. However, the income level of the visiting country is also important in determining tourism demand. According to Önder, Candemir and Kumral (2009) and Seetanah, Durbarry and Ragodoo (2010), the income level of the visiting country was important because it was an indicator of the level of economic development which could attract international tourist arrivals. As employment, business opportunities together with education facilities and quality of life are better in developed and high-income countries, they serve as *pull factors* that attract international tourism. Therefore, the income level of the origin and visiting countries are both important determinants of international tourism. Earlier empirical works (e.g. Gunadhi and Boeym 1986; Lee, Var and Blaine, 1996; Garín and Muñoz, 2007; Choyakh, 2008; Hanafiah and Harun, 2010), gross domestic product (GDP), indicated that gross national product (GNP), national disposable income, total consumption expenditure and personal income were the common indicators of income used in modelling tourism demand.

The effect of income on tourism demand can be either positive or negative depending on the type of good tourism is. If tourism is considered a normal good, the effect of income on tourism demand would be positive but less than unity. However, if tourism is considered an inferior good, the effect of income on tourism demand would be negative. It is also interesting to point out here that if tourism is considered a luxury good, the income elasticity of tourism is expected to be positive and greater than unity. According to Crouch (1994a), majority of earlier studies found that income elasticity of tourism demand is positive and greater than unity, implying that tourism is considered a luxury good. Rosensweig (1988) observed that income elasticity would normally range from 1.0 to 2.0. In some cases, the estimated income elasticity is positive but above 2.0 (e.g. Choyakh, 2008; Kim and Song, 1998; Ouerfelli, 2008). In addition, Romilly, Liu and Song (1998) found that income elasticity can also vary among income groups. They found that income elasticity was less than unity and diminished when per capita GDP increased. They noted that the income elasticity for high-income countries was 0.9, while the income elasticities for middle-income and low-income countries were 0.48 and 0.25, respectively. Toh, Khan and Goh (2006) found that income elasticity for a high-income country – Singapore was 1.43, which was a much higher figure than those suggested by Kim and Song (1998). Onafowora and Owoye (2012) observed that income elasticity varied between the Caribbean countries. They found that income elasticities for the Caribbean countries ranged from 1.36 to 4.99. These findings show that income is a very important explanatory factor of tourism demand while income elasticity can vary among countries.

2.6.2.2 Own Price

The theory of consumer behaviour strongly suggests that price is another very important determinant of demand. Under the law of demand, there is an inverse relationship between the quantity demanded and price of goods and services. This implies that increases in price are associated with a decrease in the quantity demanded. In the context of tourism demand, if there is a rise in the price of goods and services at the visiting destination, it would be less likely for tourists to visit the destination. Therefore, the number of tourist arrivals will fall. While there is no doubt that price is very important in tourism demand, it is hard to obtain an appropriate measure for tourism price because the price index for tourism is often unavailable and no one proxy can cover all aspects of tourism price.

According to tourism economics literature, tourism price includes the cost of living at the visiting destination and also the cost of travel or transport to the destination. Usually, the consumer price index (CPI) in the visiting destination is used as a proxy for cost of living at the visiting destination (Lim, 1997). However, price is a very complicated factor. Tourists may not only consider the price at the visiting destination, but they may also compare it to the price in their home country. Therefore, studies tend to use the relative price of tourism instead of the absolute price of tourism. The relative price of tourism is the ratio between the cost of goods and services that tourists have to pay at the visiting country to the cost of goods and services at their origin country. Therefore, the cost of living in the destination is usually measured by the CPI at the visiting destination relative to the CPI at the tourist generating country.

Song, Witt and Li (2009) noted that CPI may be an inappropriate measure of the cost of living at the visiting destination because the cost of living for local inhabitants and for foreign visitors at the destination may not be the same, particularly in low-income countries. In light of this, some studies have attempted to use the specific-price of tourism to capture the cost of living. For example, Gunadhi and Boey (1986), Narayan (2004) and Bonham, Gangnes and Zhou (2009) employed the shopping price index and/or hotel price index as a proxy for cost of living. Martin and Witt (1987) attempted to determine whether the CPI was an acceptable proxy for the cost of living. They discovered that there was no significant superiority of specific-price of tourism or CPI as a best measure for the cost of living in tourism demand modelling. They concluded that the CPI was a reasonable proxy for the cost of living. Likewise, Morley (1994) stated that the CPI was a reasonable proxy for tourism price in tourism demand analysis.

Apart from that, nominal exchange rate is also sometimes included in the tourism demand model to measure cost of living. The exchange rate is one of the common factors considered by tourists when deciding their visiting destinations because information on price changes (i.e. inflation or CPI) in visiting destination are generally unknown in advance (Artus, 1970; Gary, 1966). Data on the exchange rate are also easily available elsewhere because they are widely published compared to information about price (Lim, 1997). Nevertheless, Martin and Witt (1987) contended that the use of the nominal exchange rate alone as a proxy variable for the cost of living was misleading because a weak currency in the visiting destination can be adjusted by a relatively high inflation rate (see also Economist, 1978). They concluded that using only the exchange rate to measure cost of living was insufficient and difficult to be accepted.

Since price and exchange rate are equally important, Martin and Witt (1987) and Chadee and Mieczkowski (1987) suggested using the CPI of the destination divided by the CPI of origin country and adjusted by the nominal exchange rate (i.e. real exchange rate) to measure the cost of living. In this context, since the price of the tourism variable is expressed in relative terms, i.e. the ratio of prices in the visiting destination to prices in the origin country, the price elasticity should be negative in nature. However, Crouch (1992) articulated that in some cases it is also plausible to obtain positive price elasticity if the prices in the visiting destination remained constant while the prices in the origin country varied, especially when the prices are calculated using the CPI. Narayan (2004), Toh, Khan and Goh (2006), Choyakh (2008), Salleh et al. (2010), and Onafowora and Owoye (2012) found that the relative price of tourism had a negative impact on tourism demand. On the other hand, Romilly, Liu and Song (1998) and Lim and McAleer (2002) discovered that the relative price of tourism or real exchange rate was positively related to tourism demand. Thus, it can be inferred from these studies that the effect of price on tourism demand varies widely wherein it can either be positive or negative, particularly when the price of the tourism variable is defined in relative terms.

Another price element in tourism demand analysis is the cost of travel or transport. The cost of transport refers to the total expenses incurred for transport from the origin country to the visiting destination. Nevertheless, it is difficult to obtain the actual dataset for the cost of transport. In light of this, some studies used the price of crude oil as a proxy for the cost of transport (e.g. Garín-Muñoz, 2006; Salleh, Othman and Ramachandran, 2007) while others used air fares as a proxy for the cost of transport (e.g. Bechdolt, 1973; Gary, 1966; Kim and Song, 1998; Lim and McAleer, 2002). It should be noted as tourists may use different type of transport such as car, bus, train,

airplane or ferry to reach their destination. Consequently, using air fares as the sole proxy is not advisable.

Even though tourists may use the same type of transport, fares or charges could vary due to season, travel class, and competition among transportation companies (Ouerfelli, 2008). Owing to these weaknesses, Syriopoulos and Sinclair (1993) argued that it is not plausible to calculate a meaningful cost of transport. In addition, Fujii and Mak (1980) and Song, Witt and Li (2009) also documented that income and the cost of transport can be highly correlated and cause the appearance of the multicolinearity problem. In contrast, Stronge and Redman (1982) and Quayson and Var (1982) found that this variable was statistically insignificant in tourism demand modelling. Crouch (1996) also suggested that no significant bias would appear when the cost of transport variable was omitted from the tourism demand model. For these reasons, many empirical studies have not included the cost of transport variable in the tourism demand model (e.g. Choyakh, 2008; Kadir and Karim, 2009; Payne and Mervar, 2002; Romilly, Liu and Song, 1998; Song, Witt and Li, 2003; Song, Wong and Chon, 2003; Syriopoulos and Sinclair, 1993; Toh, Khan and Goh, 2006).

2.6.2.3 Substitute Price

Economic theory clearly documents that the quantity demand of goods and services are not only dependant on its own price as changes in the price of other goods and services (i.e. substitution or complementary) may also affect the quantity demanded. In the context of tourism, a potential tourist often compares the cost of living for each potential destination before deciding where to go. Hence, changes in the price of tourism at the alternative destination will affect the demand for other tourism

destinations. For example, an increase in the price of tourism at Thailand will increase the demand for tourism in Malaysia because the cost of living in Malaysia is relatively cheaper than Thailand. This implies that Malaysia is a substitute tourism destination to Thailand. Motivated by this assumption, several tourism demand studies have considered the prices of tourism at the alternative destination (e.g. Song, Wong and Chon, 2003; Song, Witt and Li, 2003; Salleh, Othman and Ramachandran, 2007; Ouerfelli, 2008; Seetanah, Durbarry and Ragodoo, 2010).

According to Song, Witt and Li (2003), Ouerfelli (2008), and Song et al. (2010), the price of tourism at the alternative destination was usually expressed in relative form, and it constituted the weighted average of the CPI of the selected tourism destinations adjusted by the nominal exchange rate. However, other tourism studies used the ratio between the CPI of each alternative tourism destination to the CPI of the original destination instead of using the weighted average approach (e.g. Kadir and Karim, 2009; Salleh et al., 2008; Salleh, Othman and Ramachandran, 2007). Studies have shown that the relationship between the substitute price of tourism and tourism demand can be positive or negative depending on whether the selected tourism destination is a substitute or a complementary destination to another destination. For instance, Song, Wong and Chon (2003) and Song et al. (2010) discovered that the substitute price of tourism is positively related to the demand for tourism in Hong Kong, while Song, Witt and Jensen (2003) found a negative relationship between the substitute price of tourism and tourism demand in Denmark. Likewise, Salleh, Othman, Ramachandran (2007), Salleh et al. (2008), Kadir and Karim (2009) also found a similar negative relationship in the case of Malaysia.

2.6.2.4 Safety and Security

Safety and security is another visible aspect that tourists may consider when choosing a destination (Barker, Page and Meyer, 2003). Tourism-crime literature indicates that crime rate and tourism are closely related. In fact, many observers have repeatedly stated that high crime rates act as a deterrent to travel. Nevertheless, the relationship between crime rate and tourism was nebulous (Pizam, 1982). Levantis and Gani (2000) examined the relationship between crime rate and tourism in eight developing economies of the Caribbean and the South Pacific. They found that crime rate and tourist arrivals had an inverse relationship, and it was statistically significant at the 5 per cent level for all the selected economies, except the Solomon Islands. In addition, Pizam (1999) noted that when confronted with the issue of crime or safety, tourists were willing to cancel or to postpone their travel or to choose an alternative travel destination that posed less risk. Obviously, safety is a primary concern for tourists when choosing a travel destination, and thus it can be deduced that tourism and crime rate have a negative relationship. Barker, Page and Meyer (2002), Alleyne and Boxill (2003) and Neumayer (2004) also yielded the same conclusion that crime rate had a negative impact on demand for tourism. This was because a high crime rate created a negative perception amongst visitors about the public security of a country. As such, the demand for tourism was reduced when the crime rate increased. This behaviour was closely linked to the "fear of crime" concept as is commonly highlighted in criminology studies since the 1960s (see George, 2003).

McPheters and Stronge (1974) conducted an empirical study on the relationship between the crime rate and tourism in Miami, Florida. They found that the relationship between tourism and crime rates in Miami was positive and statistically significant at

the 5 per cent level. Likewise, Ryan (1993) pointed out that tourism was frequently used as a means to smuggle drugs between nations. Moreover, he also documented that tourists were potential victims of crime and hence an increase in tourist arrivals would also increase the crime rate. He thus concluded that tourism served as a catalyst for criminal activities. Brunt, Mawby and Hambly (2000) also similarly demonstrated that an influx of tourists positively contributed to increased crime rates. Therefore, it can be concluded that the crime rate is an important determinant of changes in tourist arrivals.

Harper (2000) performed a brief survey on tourists' related robberies in the French Quarter of New Orleans, Louisiana. Consistent with Ryan's (1993) finding, he observed that tourists were victims of crime and there was a certain degree of planning and selection criterion of a tourist victim related to time, location and behaviour. For example, the incidence and frequency of tourist robberies were found to be very high during weekends because there were more victims to target during weekends, and the perpetrators found it easier to hide in crowds and escape. In contrast, Qiu and Zhang (1995) who examined the determinants of tourist arrivals and tourism expenditure in Canada found that the effect of crime on tourism demand was not robust. In fact, in some cases, the effect of crime on tourism demand was significantly negative while in others, it was positive. On the other hand, Zhang (1998) noted that the crime rate had a significant negative effect on tourist arrivals from the United States, Canada and China to Hong Kong. Therefore, the author suggested that tourists are very particular about travel safety and security when choosing a tourism destination. Similarly, Massidda and Etzo (2012) also affirmed that crime rate had a significant negative impact on demand for tourism in Italy.

2.6.2.5 Environmental Factors

Various scholars have emphasised the need to accommodate environmental factors into the tourism demand model. This is because although tourism behaviour cannot solely explain by environmental conditions, it could be an important factor in choosing a visiting destination and determining the length of stay. Lise and Tol (2002) and Freitas (2003) revealed that the choice of a travel destination was very sensitive to environmental factors such as pollution and weather. Hamilton and Lau (2005) added that weather was the third most important factor in decision-making on where to go and when to go. Barry and O'Hagan (1972) examined the determinants of tourist demand in Britain. They included a climate index into the model to study the implication of climate change on the demand for tourism. However, they found that this variable was insignificant as climate change was a complex phenomenon and covered elements like temperature, humidity, precipitation, sunshine, wind speed, etc. In light of this, Mieczkowski (1985) proposed a single tourism climate index (TCI) by combining several sub-indices covering temperature, humidity, precipitation, sunshine and wind speed. Amelung, Nicholls and Viner (2007) used the TCI to study tourism flows within the Mediterranean region. The study found that tourism pattern changed in response to climate change.

Shih, Nicholls and Holecek (2009) examined the impact of weather on the demand for ski-lifts in Michigan. They discovered that the demand for ski-lift was sensitive to changes in weather such as temperature and snow depth, and wind chill. Specifically, their estimation results showed that snow depth was positively related to the demand for ski-lift while temperature and wind chill had an inverse impact on the demand for ski-lifts. The study surmised that change in weather had an effect on the choice of a

destination. Lise and Tol (2002) used annual data from 1980 to 1996 from over 210 countries to analyse the relationship between tourist arrivals, climate (i.e. temperature and precipitation) and other control variables. They found a significant relationship between climatic factors and tourist arrivals. However, the climatic factors revealed strong seasonality patterns in many regions. In other words, the effect of climatic factors on tourism demand was likely to vary from time to time due to seasonality. This could be one of the potential reasons as to why many tourism demand studies did not focus on climatic factors.

A number of recent studies looked at the implications of environmental quality on tourism demand using carbon dioxide (CO_2) emissions as a proxy. Gartner (1996) emphasised that environmental quality was a very important criterion in attracting international tourists. On the other hand, Selden and Song (1994) utilised air pollution emissions (e.g. sulphur dioxide, nitrogen oxides and carbon monoxide) as a proxy for environmental quality. Massidda and Etzo (2012) examined the tourism demand function for Italy using the generalised method of moment (GMM) approach. Apart from the standard explanatory variables, the study also included CO_2 emission to examine the implication of pollution on tourism demand. They discovered that pollution had a strong significant negative effect on tourism demand. Based on this finding, they suggested that any increase in pollution (i.e. the decrease of environmental quality) would reduce tourist arrivals.

2.6.2.6 Qualitative Factors

Not all variables are quantifiable. In some cases, non-quantifiable or qualitative variables are also important in econometric modelling. In the context of tourism demand, dummy variables have been extensively used to assess the impacts of one-off events and tourists' taste changes on the demand for tourism (e.g. Chadee and Mieczkowski, 1987; Hanafiah and Harun, 2010; Hiemstra and Wong, 2002; Kadir and Karim, 2009; Kwack, 1972; Lee, 1996; Martin and Witt, 1987; Massidda and Etzo, 2012; Narayan, 2004; Onafowora and Owoye, 2012; Qiu and Zhang, 1995; Song, Wong and Chon, 2003). Examples of one-off events that reduced the level of international tourism are (a) the Persian Gulf War from the late 1990; (b) the Asian currency crisis in late 1997; (c) the terrorist attacks at the World Trade Centre in New York and the Pentagon in the United States in September 2001; (d) the bombings in Bali, Indonesia, in October 2002; (e) epidemic diseases like SARS and avian flu in 2003 and others. Likewise, various events tend to promote international tourism such as (a) the Olympics or the Commonwealth Games; (b) implementation of tourism promotional programmes; (c) international academic conferences, and other major attractions or events.

2.6.2.7 Other Explanatory Variables

There are many other explanatory variables that have been taken into account in estimating the demand function for tourism. Fujii and Mak (1981), Martin and Witt (1987), Lim and McAleer (2002), Croes and Vanegas (2005), Song, Witt and Jensen (2003), and Wang (2009) have all suggested that a lagged dependent variable is an important explanatory variable that influences the demand for tourism. They noted that the lagged dependent variable can be used to measure the impact of consumer habitual

behaviour and the word-of-mouth effect on the demand for tourism. In addition, the inclusion of the lagged dependent variable may also improve the ability to forecast international tourism demand. For example, tourists are likely to return to the destination they like because they have less uncertainty in holidaying there again compared to vacationing in other unvisited destinations. Apart from that, uncertainty can also be reduced when a potential tourist obtains information about the destination through discussions with those who have visited the destination. This is the so-called word-of-mouth effect or recommendation. Oftentimes, the word-of-mouth effect may have a greater influence than commercial advertising in determining a destination.

Tourism marketing and advertising activities are likely to be implemented by the destination's national tour offices to attract international tourist arrivals. Logically, these activities are expected to have a significant positive effect on the demand for tourism. Hence, studies have included marketing and advertising expenditure into various tourism demand models as a proxy variable. Even though tourism marketing and advertising activities are considered important, tourism demand studies that have taken these factors into account are relatively scarce. Many recent tourism demand studies do not include marketing and advertising expenditure due to the lack of sufficient and reliable datasets. Moreover, this variable is also highly correlated with the income variable. Barry and O'Hagan (1972), Stronge and Redman (1982), Uysal and Crompton (1984), Witt and Martin (1987), Crouch, Schultz and Valerio (1992), and Lee (1996) are some of the researchers who have considered this factor in modelling tourism demand behaviour. Specifically, Barry and O'Hagan (1972) found that the effect of marketing expenditure on tourism demand was not visible. Uysal and Crompton (1984) also failed to find strong evidence to support tourism marketing as an important determinant to explain the demand for tourism behaviour in Turkey. Likewise, Williams

and Spencer (2010) also found that advertising expenditure had no significant impact on tourism demand in Jamaica. In contrast, Lee (1996) discovered that South Korea's marketing expenditures successfully attracted international tourist arrivals from Japan, the United States, Hong Kong and Germany. However, marketing elasticities are relatively low (i.e. ranging from 0.05 to 0.07). Crouch (1995) conducted a meta-analysis for tourism demand to integrate the empirical findings of 80 studies on tourism demand. On average, the author found that marketing expenditure had a positive impact on tourism demand, but the size of the coefficient was relatively small compared to that of other explanatory variables. In addition, the study also observed that such positive relationships were not robust and should be interpreted with caution because very few studies focused on the effects of marketing on tourism demand. .

Other tourism demand studies have also included the deterministic time trend variable into the tourism demand model. However, as the time trend variable is highly correlated with the income variable, this can cause serious multicolinearity problems. Hence, most studies have omitted the deterministic time trend variable from the tourism demand model. In fact, only 25 out of 100 articles reviewed by Lim (1997) accommodated the deterministic time trend variable in their tourism demand model. It should be worth noting that Crouch (1996) opined that omitting the deterministic time trend variable was of little significance as its omission did not cause any serious bias.

Last but not least, the quality of education in the destination is another pivotal pull factor in attracting international tourist arrivals. However, studies on the implication of educational quality on tourism demand are very limited. Lee and Tan (1984) examined the flow of international student from less developed to developed countries. They employed cross-sectional data to achieve the objectives of their study and used the staff-

student ratio to measure the quality of local education. The study found that an increase in local educational quality reduced international student flow to developed countries. Aga (2011) documented that international students can be classified as long-term tourists and high-quality education is an important factor in attracting international students. Joseph and Joseph (1997) conducted a cross-sectional study to analyse students' perspective on the quality of education in New Zealand. The study covered 616 respondents. The study found that academic reputation was the most importance criteria considered by a student when selecting a university. In the context of tertiary education, students were also willing travel to other countries to obtain higher quality education and by default promote tourism. Mazzarol and Soutar (2002) conducted a survey to investigate factors that likely influenced an international students' choice of study destination. The survey consisted of 879 students in Australia. Among 17 potential factors that influenced the choice of study destination, reputation and the quality of education were the main pull factors to studying abroad. Hence, quality of education in the host country plays a very important role in determining the selection of a destination to study in. It thus can be surmised that the quality of education has a positive impact on international tourist arrivals.

2.6.3 Conceptual Framework: Demand for Tourism

The present study has clearly noted in the previous chapter that the exploration of key determinants of inbound tourism is an important objective that needs to be accurately determined. The present sub-section attempts to present a conceptual framework uses to understand and investigate the key factors affecting the demand for inbound tourism. Based on the literature review, the conceptual framework of tourism demand is as depicted in Figure 2.7. It can be seen from the framework that the tourists' choice of

destination (i.e. tourism demand) is not merely influenced by economic factors but also by non-economic factors. Since tourism is a discretionary activity, both economic and non-economic factors should be taken into account in constructing a comprehensive tourism demand model. Income, own price of tourism, price of alternative destination, and tourism marketing and campaign initiatives are among the key economic factors influencing tourism demand. In contrast, safety and security, quality of environment and the quality of health are some of the major non-economic factors affecting tourism demand.

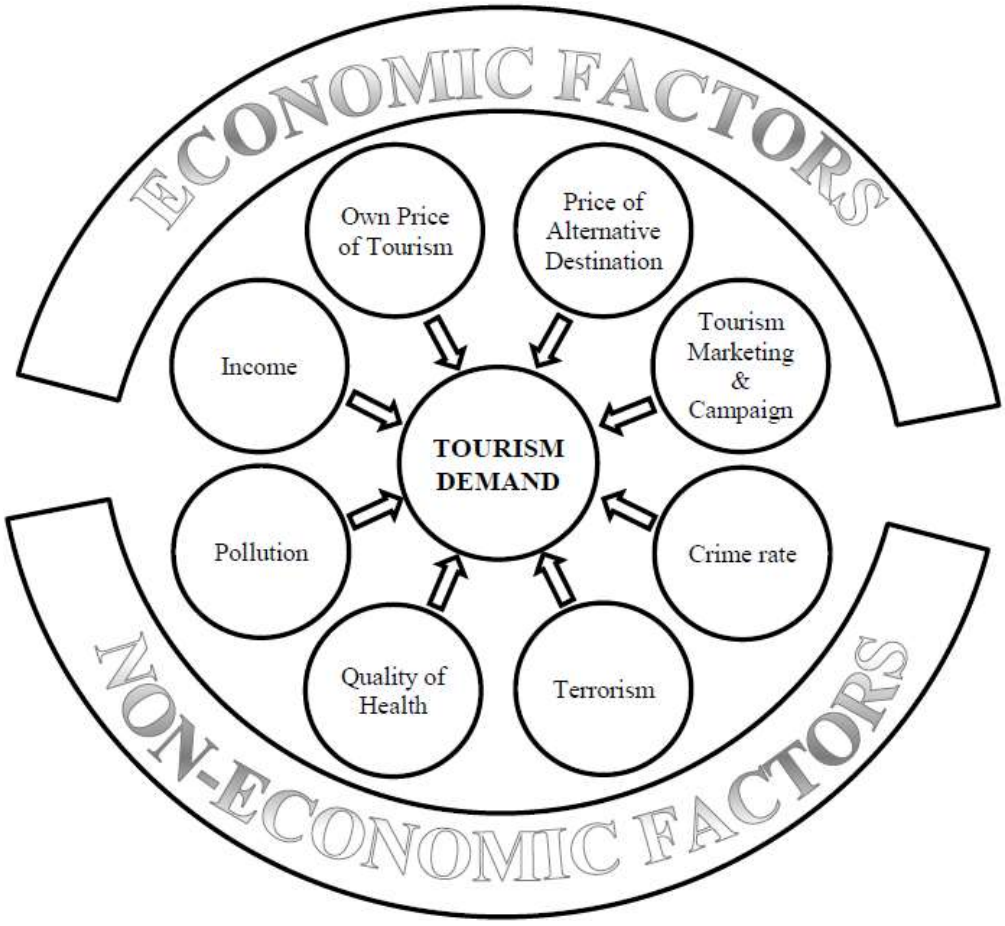


Figure 2.7: Factors Affecting Tourism Demand

The theory of consumer behaviour explains that income and price are the primary determinants of demand. According to the theory, income is expected to have a positive impact on the demand for tourism, whereas own price of tourism is expected to have a negative impact on tourism demand. Apart from own price of tourism, the price level of alternative destinations may also affect the demand for tourism. However, the impact can either be positive or negative depending on whether they are complementary or substitution tourism destinations. On the one hand, if they were substitution destinations, the price of alternative destination would be expected to have a positive effect on tourism demand. In contrast, they are expected to have a negative impact on tourism demand if they were complementary tourism destinations. In some cases, the choice of tourism destination may also be influenced by tourism marketing and campaign activities. In such a scenario, the impact of this factor on tourism demand would be expected to be positive.

In terms of non-economic factors, crime rate and terrorism are social indicators of the level of safety and security prevailing in a country. This is because no matter how good and attractive the selected destination is, tourists are likely to cancel or postpone a trip if they feel that their personal safety will be compromised. Therefore, a high incidence of crime and terrorism are expected to have a negative impact on the demand for tourism. Likewise, environmental pollution and poor quality of health are also expected to have an inverse effect on tourism demand because they would affect tourists' satisfaction and health status.

To surmise, the conceptual framework emphasises the importance of considering both economic and non-economic factors in modelling the demand for inbound tourism.

2.7 Concluding Remarks

On the whole, more than 100 studies on the tourism-growth nexus and the demand for tourism have been reviewed in this study. The literature review revealed that not many studies had focused on Malaysia. Additionally, the causal relationship between tourism and economic growth remains inconclusive. In light of this, the validity of the tourism-led growth hypothesis remains an important subject to be explored. Although there are numerous empirical studies on the tourism-growth relationship, no research has hitherto demonstrated the validity and the stability or persistency of the tourism-led growth hypothesis, particularly at the disaggregated level. In fact, many studies on tourism demand focus on standard explanatory variables, with very few of them paying much attention to other explanatory variables such as the crime rate and the quality of environment in the visiting destination. Our literature survey also revealed that none of the studies had focused on the impact of these factors on the demand for tourism in Malaysia. As a result, it is imperative to conduct an in-depth research into the tourism-led growth hypothesis and the demand for tourism in Malaysia to fill prevailing gaps in tourism and growth-related literature.

CHAPTER 3:

ECONOMIC GROWTH, TOURISM RECEIPTS AND EXCHANGE RATE IN MALAYSIA [2]

3.1 Introduction

Tourism is one of the prime sectors for stimulating economic growth and development due to its ability to generate foreign exchange revenues, new business and employment opportunities, and tax revenues (Belloumi, 2010; Clancy, 1999; Elkan, 1975). Tourism is the third largest industry in the world after oil production, and automobile manufacturing and many developing economies rely on tourism as a source for sustainable economic growth (Sinclair, 1998). One of these developing economies is Malaysia. Over the last forty years, the structure of the Malaysian economy has undergone a massive transformation from that of an agricultural-based economy to a manufacturing- and services-oriented economy. From 2000 onwards, the contribution of the services sector to the Malaysian economy has exceeded 50 per cent of the gross domestic product (GDP), whereas the contribution of agriculture and manufacturing sectors to the GDP has stagnated at about 8 per cent and 30 per cent, respectively.

Table 3.1 shows total international tourist arrivals and tourism receipts since 1990. Both tourist arrivals and tourism receipts in Malaysia have generally shown an upward trend, with the minor exceptions being 1998 during the height of the Asian Financial Crisis and 2003 due to the outbreak of the Severe Acute Respiratory Syndrome (SARS) crisis. Between 2005 and 2009, tourism receipts amounted to RM217 billion, which accounted for approximately 6.9 per cent of the GDP. Tourist arrivals in Malaysia increased

[2] The ideas of this analytical chapter have been published in *International Journal of Tourism Research*.

substantially, from 16.4 million visitors in 2005 to 23.6 million visitors in 2009. In terms of ranking, Malaysia was ranked the second most visited destination in Asia in 2005 after China (Zain, 2005). Additionally, its global ranking advanced from 11th in 2007 to 9th in 2009. Tourist arrivals in Malaysia touched a record high with the influx of 23.6 million visitors in 2009 (UNWTO, 2010).

Table 3.1: Tourist Arrivals and Tourism Receipts

Years	Tourist arrivals (in person)	Tourism receipts (RM million)
1990	7,445,908	4,500
1995	7,468,749	9,175
1998	5,550,748	8,580.4
1999	7,931,149	12,321.3
2000	10,221,582	17,335.4
2001	12,775,073	24,221.5
2002	13,292,010	25,781.1
2003	10,576,915	21,291.1
2004	15,703,406	29,651.4
2005	16,431,055	31,954.1
2006	17,546,863	36,271.1
2007	20,972,822	46,070
2008	22,052,488	49,561.2
2009	23,646,191	53,367.7

Source: Malaysia Tourism Promotion Broad (MTPB)

Given the importance of tourism to economic growth, numerous studies have focused on the nexus between tourism and economic growth in developed and developing countries, including Malaysia. However, these studies have not provided any conclusive evidence as to the existence of a causal link between tourism and economic growth. Oh (2005) on Korea, Tang and Jang (2009) on the United States, Narayan et al. (2010) on the Pacific Island states, and Nanthakumar, Ibrahim and Harun (2008) on Malaysia have all suggested that economic growth Granger-causes tourism because high-growth countries are more likely to have many businesses and working opportunities. In contrast, other studies (e.g. Belloumi, 2010; Lau, Oh and Hu, 2009; Lean and Tang,

2010; Lee and Hung, 2010) postulated that tourism Granger-causes economic growth through increased foreign exchange earnings, more employment opportunities, and higher tax revenues besides yielding other tangible and intangible benefits. Nevertheless, the question as to whether tourism development actually causes economic growth or vice versa has remained unresolved. The resolution to this conundrum is vital as recognising the direction of causality is imperative for not only understanding the process but also in formulating the appropriate tourism and growth policies (Deaton 1995; Oh, 2005). A major reason for the conflicting Granger causality results is that most tourism-growth studies, particularly on Malaysia, are based upon bivariate frameworks, which are often constrained by the omission of variable(s) bias (Lütkepohl, 1982). Gunduz and Hatemi-J (2005) and Katircioğlu (2009a, 2010b) observed that the exchange rate was considered a vital variable that influences tourism growth and its relationship with economic growth. These observations indicate that the findings on causal relationships as provided in previous studies are open to debate.

Apart from the conflicting causality results, the key motivation for revisiting Malaysia's tourism-growth nexus is due to the inappropriate choice of tourism variables and the weaknesses in the estimation techniques of earlier studies (e.g. Lau, Oh and Hu, 2009; Lean and Tang, 2010; Sarmidi and Salleh, 2011; Othman, Salleh and Sarmidi, 2012). In fact, there is a tendency for existing studies to use international tourist arrivals as a proxy for tourism to examine the benefits of tourism to economic growth (e.g. Lau, Oh and Hu, 2009; Lean and Tang, 2010; Brida and Risso, 2010; Katircioğlu, 2011; Ghosh, 2011; Tang and Abosedra, 2012). The flaw in this approach resides in the fact that not all international tourist arrivals contribute to economic growth because some are merely scouting missions for business and employment opportunities rather than for tourism purposes. Hence, a country may experience high rates of international tourist arrivals

but low rates of tourism receipts. Consequently, international tourist arrivals may not be a good proxy for tourism, and thus it would be more appropriate to use tourism receipts to examine the validity of the tourism-led growth hypothesis. Furthermore, none of the research efforts on Malaysia accounted for the effects of structural break(s) in the unit root tests. Perron (1989) and Zivot and Andrews (1992) revealed that when the effect of structural break(s) is neglected, the power of standard unit root test decreases drastically, and this might lead to false acceptance of a unit root null hypothesis. In addition to these shortcomings, tourism-growth studies in Malaysia have thus far only focused on in-sample tests; thus ignoring the dynamic inter-relationship between variables in the system. In fact, such approaches contradict Solow's (2001) observation that most economic relationships are dynamic in nature thus raising doubts about the veracity of results obtained thus far.

Motivated by these modelling imperfections and the implications of tourism on economic growth, this study seeks to re-investigate the relationship between economic growth, real tourism receipts and real exchange rate in Malaysia from 1975 to 2010. This study is more comprehensive compared to previous tourism-growth studies in Malaysia is that unlike earlier studies, a thorough examination of the time series properties of the data is undertaken by employing the unit root test with two structural breaks as developed by Narayan and Popp (2010) in tandem with the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. Second, the newly developed combined cointegration test proposed by Bayer and Hanck (2010, 2013) will be applied to examine the presence of a long-run equilibrium relationship between economic growth, real tourism receipts and real exchange rate in Malaysia. Third, the Granger causality test will be utilised to assess the Granger causality between these variables. Finally, the variance decomposition and impulse response function will be

deployed to assess the dynamic interaction between the variables in the system. In short, this four-pronged approach is designed to yield more comprehensive and reliable estimations.

The outline of this study is organised as follows. The methodology will be discussed in the next section. Section 3.3 explains the empirical results of this study. Finally, the concluding remarks will be reported in Section 3.4.

3.2 Methodology

This section will provide a comprehensive elaboration of the methodology employed in this study.

3.2.1 Empirical Model and Data

Over the past few decades, many empirical studies, particularly based upon the growth accounting framework have been conducted to analyse catalysts of growth. Within economic growth literature, recent studies have highlighted the fact that international tourism is an important source of economic growth (e.g. Balaguer and Cantavella-Jordá, 2002). In fact, the theoretical and conceptual frameworks presented in Chapter 2 also noted the role of tourism as an input in economic growth. Besides tourism functioning as an input, Balaguer and Cantavella-Jordá (2002) and Katircioğlu (2009a, 2010b) added that the exchange rate is considered an essential variable influencing tourism growth and its relationship with economic growth. Additionally, Oh (2005) noted that the inclusion of exchange rate in the tourism-growth model could also deal with the omitted variable problem. In light of these findings, the Balaguer and Cantavella-Jordá

(2002) model will be used to investigate the tourism-led growth hypothesis in Malaysia. In fact, this model specification has been extensively used by other studies (e.g. Brida, Carrera and Risso, 2008; Brida and Risso, 2009, 2010; Belloumi, 2010; Payne and Mervar, 2010; Brida, Punzo and Risso, 2011; Ghosh, 2011; Katircioğlu, 2009; 2011) to examine the validity of the tourism-led growth hypothesis. The model specification used in this study is expressed as:

$$Y_t = f\left(TR_t, RER_t\right) \tag{3.1}$$

In the above model, real income or economic growth $\left(Y_t\right)$ is a function of real tourism receipts $\left(TR_t\right)$ and real exchange rate $\left(RER_t\right)$.[3] In econometric terms, the model is rewritten as follows:

$$\ln Y_t = \beta_0 + \beta_1 \ln TR_t + \beta_2 \ln RER_t + \varepsilon_t \tag{3.2}$$

where $\ln Y_t$ is the natural logarithm of real income, $\ln TR_t$ is the natural logarithm of real tourism receipts and $\ln RER_t$ denotes the natural logarithm of real exchange rate. ε_t is the residual which is assumed to be normally distributed and white noise. β_1 is the coefficient for real tourism receipts, while β_2 is the coefficient for real exchange rate. Hence, the expected sign of coefficient for real tourism receipts is positive while real exchange rate is expected to have a negative impact on real income.

[3] Balaguer and Cantavella-Jordá (2002) documented that model specification with too many variables would increase the likelihood to obtain more than one relationship in the long-run and provide confusing results. In the statistical point of view, additional variables may consume the degree of freedom and reduce the testing power of a test. Therefore, the parsimonious model is preferred in the analysis of long-run relationship between tourism and economic growth.

This study covers the annual sample from 1975 to 2010. The data used in this study namely real GDP, real tourism receipts, and real effective exchange rate for the Malaysian economy were collected from the *International Financial Statistics* (IFS) published by the International Monetary Fund (IMF), the *World Development Indicators* (WDI) reported by the World Bank, and CEIC databases. All variables were transformed into natural logarithms to induce stationarity in the variance-covariance matrix. Hence, the first difference of the variables can be interpreted in growth terms.

3.2.2 Unit Root Test

In this section, the present study presents the new unit root test with two structural breaks suggested by Narayan and Popp (2010). They proposed two versions of endogenous breaks models to investigate the null hypothesis of a unit root. Model M1 allows for two structural breaks in the intercept while Model M2 allows for two structural breaks in both the intercept and the slope of the trend function. The models for testing two structural breaks unit root test is stated as follows:

Model M1: $$y_t = \kappa + \alpha y_{t-1} + \beta t + \varphi_1 D(T_B)_{1,t} + \varphi_2 D(T_B)_{2,t} + \theta_1 DU_{2,t-1} + \theta_2 DU_{2,t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + e_{1t} \quad (3.3)$$

Model M2: $$y_t = \kappa + \alpha y_{t-1} + \beta t + \varphi_1 D(T_B)_{1,t} + \varphi_2 D(T_B)_{2,t} + \theta_1 DU_{1,t-1} + \theta_2 DU_{2,t-1} + \phi_1 DT_{1,t-1} + \phi_2 DT_{2,t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + e_{2t} \quad (3.4)$$

where Δ is the first difference operator, p is the optimal lag length and the residuals e_{it} are assumed to be normally distributed and white noise. $DU_{i,t} = 1\left(t > T_{B,i}\right)$ and $DT_{i,t} = 1\left(t > T_{B,i}\right)\left(t - T_{B,i}\right)$, $i = 1, 2$, denote the dummy variables for breaks in the intercept while the slope of the trend function occurs at T_{B1} and T_{B2}, respectively. The *t*-statistic of y_{t-1} can be used to examine the null hypothesis of a unit root against the alternative hypothesis of stationarity. Finally, the potential break dates $\left(T_{B1},\ T_{B2}\right)$ can be chosen simultaneously using grid search or sequential procedures as discussed in Narayan and Popp (2010).

3.2.3 Combined Cointegration Test

The idea of cointegration and the residual-based testing procedure for cointegration was first conceptualised by Engle and Granger (EG, 1987). Since then, a large number of studies have applied this procedure, and some have developed alternative testing procedures for cointegration. Among the prominent tests for cointegration are the system-based test of Johansen (JOH, 1988), the ECM-based F-test of Boswijk (BO, 1994) and the ECM-based *t*-test of Banerjee, Dolado and Mestre (BDM, 1998). Nonetheless, cointegration test results are very sensitive to the choice of techniques because no one technique is perfect and completely robust in all applications (Elliott, Jansson and Pesavento, 2005; Gregory, Haug and Lomuto, 2004). To enhance the power of the cointegration test, the newly developed combined cointegration technique suggested by Bayer and Hanck (2010, 2013) will be used to investigate the presence of cointegration between economic growth, real tourism receipts and real exchange rate in Malaysia. A uniqueness of this new test is that it allows for the combination of various individual cointegration test results to yield a conclusive finding. In relation to this,

Bayer and Hanck (2010, 2013) utilised the following Fisher's formulae to combine the *p*-values of different individual cointegration tests:

$$EG\text{-}JOH = -2\left[\ln\left(p_{EG}\right)+\ln\left(p_{JOH}\right)\right] \tag{3.5}$$

$$EG\text{-}JOH\text{-}BO\text{-}BDM = -2\left[\ln\left(p_{EG}\right)+\ln\left(p_{JOH}\right)+\ln\left(p_{BO}\right)+\ln\left(p_{BDM}\right)\right] \tag{3.6}$$

Here p_{EG}, p_{JOH}, p_{BO} and p_{BDM} are the *p*-values of the Engle-Granger (EG), Johansen (JOH), Boswijk (BO), and Banerjee-Dolado-Mestre (BDM) cointegration tests, respectively.[4] If the calculated Fisher statistic exceeds the critical value tabulated in Bayer and Hanck (2010), the null hypothesis of no cointegration is rejected.

3.2.4 Granger Causality Test

The Granger causality test was designed to examine the direction of causality between variables. It is also essential to point out that if the variables were found to be cointegrated, the Granger causality test should be carried out under the Error-Correction Model (ECM). In doing so, short-run deviations of series from their long-run equilibrium path can be captured by incorporating a one period lagged error-correction term (Narayan and Smyth, 2004). However, if the variables were found to be not cointegrated, the first difference vector autoregressive (VAR) model should be used to perform the Granger causality test. Assuming that the variables are cointegrated, the Granger causality test will be conducted by estimating the following ECMs:

[4] Please refer to Maddala and Kim (1998) for detailed testing procedures of the individual cointegration tests.

$$\Delta \ln Y_t = \upsilon_1 + \sum_{i=1}^{p} \gamma_i \Delta \ln Y_{t-i} + \sum_{i=1}^{q} \vartheta_i \Delta \ln TR_{t-i} + \sum_{i=1}^{r} \varpi_i \Delta \ln RER_{t-i} + \psi_1 ECT_{t-1} + \xi_{1t} \quad (3.7)$$

$$\Delta \ln TR_t = \upsilon_2 + \sum_{i=1}^{p} \vartheta_i \Delta \ln TR_{t-i} + \sum_{i=1}^{q} \gamma_i \Delta \ln Y_{t-i} + \sum_{i=1}^{r} \varpi_i \Delta \ln RER_{t-i} + \psi_2 ECT_{t-1} + \xi_{2t} \quad (3.8)$$

$$\Delta \ln RER_t = \upsilon_3 + \sum_{i=1}^{p} \varpi_i \Delta \ln RER_{t-i} + \sum_{i=1}^{q} \vartheta_i \Delta \ln TR_{t-i} + \sum_{i=1}^{r} \gamma_i \Delta \ln Y_{t-i} + \psi_3 ECT_{t-1} + \xi_{3t} \quad (3.9)$$

where ECT_{t-1} is a one period lagged error-correction term derived from the long-run cointegrating relationship. The residuals ξ_{it} are assumed to be normally distributed and white noise with *p*, *q* and *r* being the optimal lag length. If the variables moved together in the long-run (i.e. cointegrated), there would be short- and long-run causalities. In equation (3.7), to test whether tourism receipts do not Granger-cause economic growth in the short-run, the significance of the $\Delta \ln TR_{t-i}$ can be examined by testing the null $H_0 : \vartheta_1 = \vartheta_2 = \cdots = \vartheta_i = 0$ using the likelihood ratio (LR) test. In order to test whether tourism receipts do not Granger-cause economic growth in the long-run, the significance of $\Delta \ln TR_{t-i}$ and ECT_{t-1} can be examined by testing the null $H_0 : \vartheta_1 = \vartheta_2 = \cdots = \vartheta_i = 0$ and $\psi_1 = 0$ using the LR test. Rejection of the null hypothesis implies that tourism receipts Granger-cause economic growth. Likewise, in equation (3.8), to test whether economic growth do not Granger-cause tourism receipts in the short-run, a joint LR test on the null $H_0 : \gamma_1 = \gamma_2 = \cdots = \gamma_i = 0$ will be applied. The long-run Granger causality from economic growth to tourism receipts can be tested by using a joint LR test on the null $H_0 : \gamma_1 = \gamma_2 = \cdots = \gamma_i = 0$ and $\psi_2 = 0$. Rejection of the null hypothesis would indicate that economic growth Granger-causes tourism receipts. As noted in the foregoing, similar procedures can be applied to examine the short- and long-run causal effect of other variables in the system such as the causal effect of real exchange rate on real tourism receipts and economic growth or vice versa.

3.3 Empirical Results

In this section, the empirical results derived by the respective tests as elucidated in the previous section are discussed.

3.3.1 Unit Root Results

According to Granger and Newbold (1974), regression results with non-stationarity and/or non-cointegrated variables are spurious. Therefore, the pre-testing of the unit root is mandatory so as to determine the order of integration of each series. To determine the order of integration in this study, the ADF and PP unit root tests were first applied. The ADF and PP unit root tests results are reported in Table 3.2. Both the ADF and PP unit root tests indicate that real tourism receipts is stationary at level, while real income and real exchange rate in Malaysia are stationary after first differencing.

Table 3.2: The Results of ADF and PP Unit Root Tests

Variables	ADF	PP
$\ln Y_t$	–2.836 (3)	–3.308 (2)
$\Delta \ln Y_t$	–4.768 (1)***	–5.758 (6)***
$\ln TR_t$	–4.109 (1)**	–4.079 (9)**
$\Delta \ln TR_t$	–5.656 (3)***	–14.902 (18)***
$\ln RER_t$	–2.688 (1)	–2.270 (2)
$\Delta \ln RER_t$	–5.058 (0)***	–5.042 (2)***

Note: The asterisks *** and ** denote significance at the 1 and 5 per cent levels, respectively. Figure in the parenthesis ( ) is the optimal lag length for ADF test or the bandwidth for PP test. The optimal lag length for ADF is determined by Akaike's Information Criterion (AIC), while the bandwidth for the PP unit root test is determined using the Bartlett-Kernel procedure. The procedure suggested by Enders (2004) has been used to select the deterministic components (i.e. intercept and trend) in the testing model.

As noted in the earlier section, both ADF and PP unit root tests display low power when a series is confronted with structural break(s). To circumvent this problem, the Narayan-Popp two breaks unit root test is utilised to confirm the order of integration of each series. The results for Narayan-Popp test and the critical values are reported in Table 3.3. Contrary to the results of ADF and PP tests, this study finds that the Narayan-Popp test statistics for all variables under investigation, including real tourism receipts are less than the 5 per cent critical values. Thus, the Narayan-Popp tests cannot reject the null hypothesis of a unit root. These results indicate that real income, real tourism receipts and real exchange rate are integrated of order one, $I(1)$. Apart from the order of integration, it is also important to discuss the timing of the identified break dates. Generally, the identified break dates coincide with certain events. Table 3.3 shows that the first group of break dates occurred from 1985 to 1989, while the second group of break dates occurred between 1997 and 2000.

Table 3.3: The Results of Narayan-Popp Unit Root Tests with Two Structural Breaks

	Model for unit root test with two structural breaks					
	M1			M2		
	$\ln Y_t$	$\ln TR_t$	$\ln RER_t$	$\ln Y_t$	$\ln TR_t$	$\ln RER_t$
TB1	1985	1989	1985	1988	1989	1985
TB2	1997	1997	1997	2000	1997	1997
Lag length	0	3	0	1	0	0
Test statistics	–2.440	–2.211	–3.725	–4.738	–4.252	–2.918
Critical values						
Significant level	1 per cent	5 per cent		1 per cent	5 per cent	
$T = 50$	–5.259	–4.154		–5.949	–5.181	

Note: The GAUSS programming codes provided by Paresh Kumar Narayan and Stephen Popp were used to compute the above unit root test with two structural breaks. The optimal lag length was determined by the t-significance test.

In the case of real income, it was noted that the break dates occurred in 1985, 1988, 1997 and 2000. Similarly, the break dates for real tourism receipts were also within the same time frame, as in 1989 and 1997. Those identified break dates from 1985 to 1989 can be linked to the world economic recession in the mid-80s, while the break dates for real income and real tourism receipts in 1997 and 2000 coincided with the Asian Financial Crisis, the Commonwealth Games of 1998 and the Sepang Formula One Grand Prix in late 1999. The results also reveal that the break dates for real exchange rate occurred in 1985 and 1997. As in real income and real tourism receipts, the break dates for real exchange rate is attributable to the world economic recession in 1985 and the Asian Financial Crisis in 1997.

3.3.2 Combined Cointegration and Granger Causality Results

After determining the stationarity properties of each series, the next stage involved examining the presence of a long-run equilibrium between real tourism receipts, economic growth and real exchange rate in Malaysia using the combined cointegration technique. Even though combined cointegration tests are relatively more robust and provide more conclusive results compared to individual cointegration tests, their results are also sensitive to the lag structure. In order to overcome this problem, the optimal lag structure based upon the Akaike Information Criterion (AIC) was selected.

Table 3.4: The Results of Combined Cointegration Tests

	Fisher's statistics	Critical values		
		1 per cent	5 per cent	10 per cent
EG-JOH	10.900**	16.679	10.895	8.479
EG-JOH-BO-BDM	33.362***	32.077	21.106	16.444

Note: The asterisks *** and ** denote statistical significant level at the 1 and 5 per cent, respectively.

Table 3.4 shows the calculated Fisher's statistics for the presence of a long-run relationship between economic growth, real tourism receipts and real exchange rate in Malaysia. Two types of combined cointegration tests are illustrated in Table 3.4, namely the EG-JOH and EG-JOH-BO-BDM tests. Overall, the statistics derived from both EG-JOH and EG-JOH-BO-BDM combined tests for cointegration consistently suggest that economic growth, real tourism receipts and real exchange rate in Malaysia are cointegrated at the conventional significance levels (i.e. 1, 5 and 10 per cent). It should be noted that the EG-JOH test can only reject the null hypothesis of no cointegration at the 5 per cent significance level while the combined EG-JOH-BO-BDM test rejects the null hypothesis of no cointegration at the 1 per cent significance level. In summary, the results of combined cointegration tests suggest that there is a long-run relationship among the three variables under review.[5] This result is consistent with the findings of Kadir, Nayan and Abdullah (2010), Narayan et al. (2010), Katircioğlu (2010b), Sarmidi and Salleh (2011), and Tang and Abosedra (2012).

As the variables were found to be cointegrated, the long-run elasticities was estimated using three different long-run estimators, namely the Autoregressive Distributed Lag (ARDL) procedure suggested by Pesaran and Shin (1999), the Dynamic Ordinary Least Squares (DOLS) postulated by Stock and Watson (1993), and the Fully Modified Ordinary Least Squares (FMOLS) proposed by Phillips and Hansen (1990). The use of more than one long-run estimator is designed to check the robustness of the long-run results. The long-run elasticities are reported in Table 3.5. Despite the estimated coefficients being slightly different among the three long-run estimators, the overall

[5] For robustness, the presence of a long-run equilibrium relationship between economic growth, real tourism receipts and real exchange rate in Malaysia were reconfirmed using the bounds testing approach to cointegration proposed by Pesaran, Shin and Smith (2001). Similar to the results of combined cointegration tests reported in Table 3.4, the results of bounds testing approach to cointegration also suggest that the variables are cointegrated at the 1 per cent significance level. Therefore, there is a meaningful long-run relationship between economic growth, real tourism receipts and real exchange rate in Malaysia. The entire results of bounds test are not reported in the main text, but they are available in Table A.1 of Appendix A.

long-run results are fairly robust with regard to the effect of real tourism receipts and real exchange rate on economic growth in Malaysia.

Table 3.5: The Results of Long-Run Coefficients

Explanatory variables	Coefficients	Standard error	t-statistics
Pesaran and Shin (1999) – Autoregressive Distributed Lag (ARDL):			
Constant	10.8608***	1.2444	8.7279
$\ln TR_t$	0.4481***	0.0336	13.3532
$\ln RER_t$	–0.4846**	0.1961	–2.4708
Stock and Watson (1993) – Dynamic Ordinary Least Squares (DOLS):			
Constant	10.4478***	0.8092	12.9112
$\ln TR_t$	0.4551***	0.0231	19.7195
$\ln RER_t$	–0.4123***	0.1227	–3.3589
Phillips and Hansen (1990) – Fully Modified Ordinary Least Squares (FMOLS):			
Constant	9.6200***	0.8776	10.9616
$\ln TR_t$	0.4795***	0.0237	20.2622
$\ln RER_t$	–0.3274**	0.1435	–2.2818

Note: The asterisks *** and ** denote significance at the 1 and 5 per cent levels, respectively

For example, the three long-run estimators consistently show that in the long-run, the impact of real tourism receipts on economic growth in Malaysia is likely to be positive. In contrast, real exchange rate tends to have a negative impact on economic growth in Malaysia. All coefficients were observed to be statistically significant at the 5 per cent level or better. More specifically, the impact of the real tourism receipts on economic growth is approximately 0.5, implying that a 10 per cent increase in real tourism receipts would yield an approximately 5 per cent increase in economic growth in the long-run. Similarly, a 10 per cent increase in the real exchange rate (i.e. appreciation of the Malaysian Ringgit) would reduce Malaysia's economic growth by between 3.2 per cent and 4.8 per cent. Subsequent to the affirmation of the existence of a long-run

equilibrium relationship, as presented in Table 3.4, the Granger causality test was conducted using the ECM framework to capture the short- and long-run causalities. Table 3.6 provides the LR test statistics for the short- and long-run causalities. Before the direction of Granger causality between the variables of interest was examined, several diagnostic tests on ECM equations were performed.

Table 3.6: The Results Short- and Long-Run Granger Causality Test

Null hypothesis	Source of causation	
	Short-run causality	Long-run causality
	Likelihood ratio (LR) statistics	
$\Delta \ln TR \not\rightarrow \Delta \ln Y$	19.822***	29.771***
$\Delta \ln Y \not\rightarrow \Delta \ln TR$	2.489	5.589*
$\Delta \ln TR \not\rightarrow \Delta \ln RER$	9.221**	16.163***
$\Delta \ln RER \not\rightarrow \Delta \ln TR$	0.902	8.261**
$\Delta \ln Y \not\rightarrow \Delta \ln RER$	11.616***	17.968***
$\Delta \ln RER \not\rightarrow \Delta \ln Y$	20.568***	36.593***

Note: The asterisk ***, ** and * denote significance at the 1, 5 and 10 per cent levels, respectively.

The results indicate that the ECM equations for Granger causality test passed the aforementioned diagnostic tests.[6] Beginning with the results of short-run causality, it is evident that Malaysia's economic growth and real exchange rate bi-directionally Granger-cause each other. Moreover, there is also evidence of a uni-directional Granger causality running from real tourism receipts to economic growth and real exchange rate. Turning to long-run causality, the results suggest that economic growth, real tourism receipts and real exchange rate are of bi-directional causality at the 10 per cent significance level. However, at the 5 per cent significance level, the results reveal a uni-

[6] Various diagnostic tests were conducted. It was found that the estimated ECM equations for Granger causality tests were free from serial correlation and autoregressive conditional heteroskedasticity (ARCH) problems. In addition, the residuals were normally distributed. Finally, the Ramsey RESET tests revealed no misspecification error and/or functionality problem. In addition, the CUSUM and CUSUMSQ statistics revealed that the estimated parameters were stable over time. This implied that the Granger causality results generated by these ECM equations were valid and worthy of interpretation. The full results of diagnostic tests are available in Table A.2 of Appendix A.

directional Granger causality running from real tourism receipts to economic growth in the long-run. Certainly, the findings of this study support the tourism-led growth hypothesis which postulates that tourism Granger-causes economic growth and tourism is also a long-term growth catalyst for the Malaysian economy.[7] These results correspond with the findings of Balaguer and Cantavella-Jordá (2002), Durbarry (2004), Gunduz and Hatemi-J (2005), Belloumi (2010), Katircioğlu (2010b) and Vaneges (2012).

3.3.3 Variance Decomposition and Impulse Response Function

Thus far, the analyses have been restricted to in-sample tests, hence dynamic properties or the inter-relationships among variables in the system may have been inadvertently ignored. To gain further insights into the dynamic relationship between economic growth, real tourism receipts and real exchange rate in Malaysia, both forecast error variance decomposition and the impulse response function tests were conducted. The variance decomposition and impulse response function are both out-of-sample tests that are useful in examining the degree of exogeneity or endogeneity of the variables and the dynamic responses of the variables beyond the sample period (Tan and Baharumshah, 1999; Narayan and Smyth, 2003; Tan and Tang, 2012). The variance decomposition test provides information pertaining to the relative strength of a variable in comparison to other variables in the system while the impulse response functions test reveals the directions of a response to a random shock impacting a variable in the system. Following the empirical strategy of Sims (1980), the variance decomposition analysis and the impulse response function test under Cholesky factorisation were conducted. It

[7] Apart from using the standard Granger causality test as presented in Table 3.6, the causality test proposed by Toda and Yamamoto (1995) and Dolado and Lütkepohl (1996) – TYDL was employed to affirm the direction of causality between real tourism receipts and economic growth in Malaysia. In addition, the TYDL causality test was applied in association with the bootstrap approach to produce robust critical values. The results of TYDL causality test indicate that real tourism receipts Granger-causes economic growth in Malaysia. The full causality results are available in Table A.3 of Appendix A.

should be noted that the results from Cholesky factorisation is principally based upon the causal orderings of the variables in the system unless the correlations among the contemporaneous residuals are fairly low. In practise, the orderings of the variables are usually arranged from the most exogenous to the most endogenous. Alternatively, the orderings of the variables can also be done according to economic theory.[8] In the context of the present study, economic growth, real exchange rate and real tourism receipts are the three variables in the system. Based upon economic theory and also the objectives of this study, the variables were arranged in the following order: real exchange rate, real tourism and economic growth.[9]

The results of variance decomposition analysis are reported in Table 3.7. The results reveal that in both the short-run (i.e. 2 years) and in the long-run (i.e. 15 years), real exchange rate is relatively the most exogenous variable followed by real tourism and economic growth. After 2 years, 42.80 per cent of the variation in economic growth is attributed to its own innovations while 87.68 per cent and 99.78 per cent of the variation in real tourism receipts and real exchange rate, respectively are attributed to their own innovations. In the long-run, this study finds that the forecast error variance for economic growth, real tourism receipts and real exchange rate are 22.13 per cent, 76.28 per cent and 95.64 per cent, respectively. In explaining the variation of economic growth in Malaysia, the results of the variance decomposition test show that real tourism receipt is relatively more important than the real exchange rate in the long-run. At the end of 15 years, real tourism receipts and real exchange rate jointly explain 77.87 per cent of the variation in economic growth. Obviously, both variables play important roles in explaining Malaysia's economic growth, particularly in the long-run. This is in

[8] If the ordering of the variables is unknown, one may employ the generalised version of variance decomposition and impulse response function (Pesaran and Shin, 1998).

[9] According to the economic theory, a depreciation of domestic currency would increase the demand for inbound tourism because the exchange rate is part of tourism price. An increase of tourism demand would also increase tourism receipts which in turn lead to economic growth.

line with Granger causality evidence provided in Table 3.6, wherein real tourism receipts and real exchange rate Granger-cause real economic growth in the short- and long-run. Specifically, 67.02 per cent and 10.85 per cent of the variation in economic growth are explained by real tourism receipts and real exchange rate, respectively.

Table 3.7: The Results of Variance Decomposition Analysis

Relative variance of economic growth			
Year	Economic growth	Tourism	Exchange rate
1	51.50	0.96	47.54
2	42.80	7.86	49.34
3	41.77	17.20	41.03
4	36.62	30.92	32.46
5	33.73	38.48	27.78
10	25.18	59.24	15.58
15	22.13	67.02	10.85
Relative variance of tourism			
1	0.00	94.54	5.46
2	3.59	87.68	8.73
3	8.24	82.74	9.01
4	11.06	79.98	8.96
5	11.96	79.16	8.89
10	13.33	77.40	9.27
15	14.30	76.28	9.42
Relative variance of exchange rate			
1	0.00	0.00	100.00
2	0.01	0.21	99.78
3	0.91	3.06	96.03
4	2.34	2.77	94.90
5	3.02	2.27	94.71
10	3.13	1.45	95.41
15	3.24	1.12	95.64

Note: The Cholesky decomposition ordering: exchange rate, tourism and economic growth.

Although shocks on real tourism receipts decline gradually over the 15 year period, most variations in real tourism receipts are explained by its innovations. In fact, after 2 years, only 3.59 per cent and 8.73 per cent of the variations in real tourism receipts are

attributable to economic growth and real exchange rate, respectively while at 15 years, economic growth and real exchange rate accounted for only 23.72 per cent of the variations in real tourism receipts. In terms of strength, economic growth is relatively more important than the real exchange rate in explaining variations in real tourism receipts in the long-run. In the case of real exchange rate, the results of variance decomposition also reveal that the effect of economic growth and real tourism receipts on the real exchange rate in Malaysia was rather small in both short- or long-run scenarios. Specifically, almost all the variations in the forecast error variance for real exchange rate are attributable to its own innovations. Economic growth and real tourism receipts accounted for less than 1 per cent of variation in real exchange rate in the short-run and less than 5 per cent in the long-run.

Next, this study performed the impulse response function test to examine the dynamic interaction between variables in the system. The plots of the impulse response function of economic growth, real tourism receipts and real exchange rate to one-standard deviation shocks in economic growth, real tourism receipts and real exchange rate are displayed in Figures 3.1 to 3.3. Figure 3.1 illustrates that over the entire 15 years period, real tourism receipts exert a positive effect on economic growth while the real exchange rate exerts a negative impact on economic growth in Malaysia, except over the first two years. A shock to real tourism receipts increases economic growth in the first four years, and stabilises thereafter. In contrast, a shock to real exchange rate has a slightly positive impact on economic growth in Malaysia up to year two and a negative impact thereafter. This result corresponds with that of the long-run elasticities as depicted in Table 3.5 wherein real tourism receipts have a positive impact on economic growth while the real exchange rate has an inverse impact on economic growth.

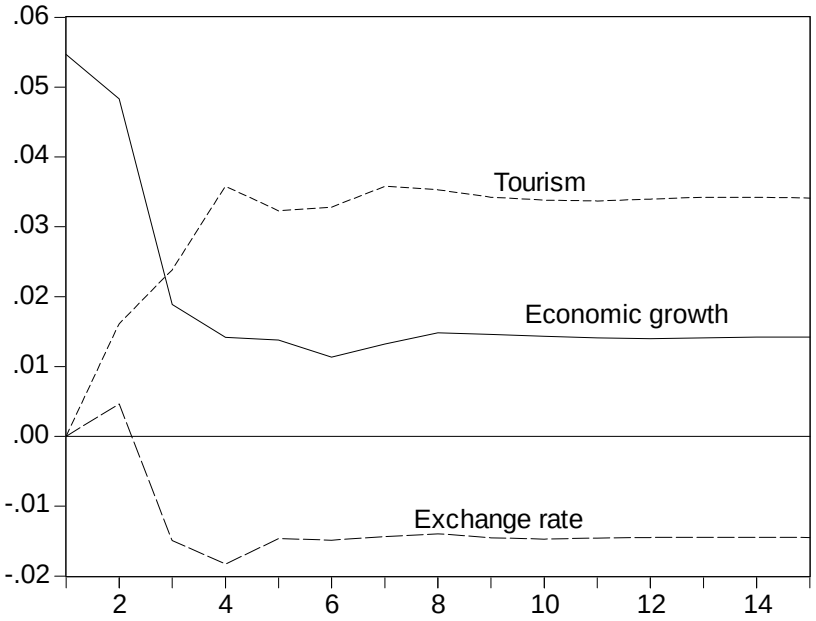


Figure 3.1: Impulse Responses of Economic Growth to One-Standard Deviation Shocks in Economic Growth, Tourism and Exchange Rate

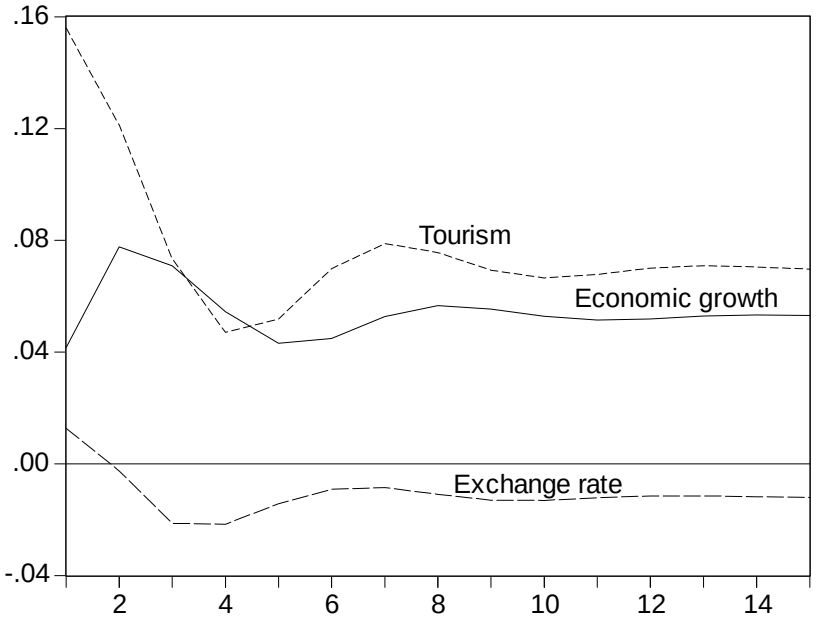


Figure 3.2: Impulse Responses of Tourism to One-Standard Deviation Shocks in Tourism, Economic Growth and Exchange Rate

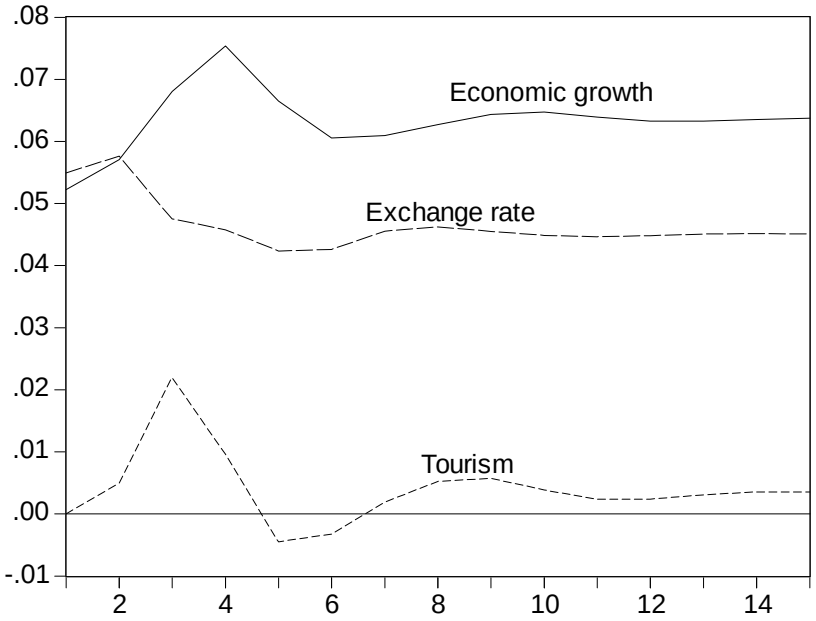


Figure 3.3: Impulse Responses of Exchange Rate to One-Standard Deviation Shocks in Exchange Rate, Economic Growth and Tourism

Figure 3.2 shows that over the entire 15 year period, economic growth exerts a positive effect on real tourism receipts while the real exchange rate exerts a negative impact on real tourism receipts in Malaysia. These findings corroborate the theory of consumer behaviour which states that income is positively related to tourism demand while demand for tourism is negatively correlated with its price (i.e. real exchange rate). The results of the impulse response function test highlight that a shock to economic growth increases real tourism receipts in the first two years, before stabilising after year six. Similarly, a shock to real exchange rate decreases real tourism receipts in the first three years and stabilises thereafter. Finally, Figure 3.3 shows that both real tourism receipts and economic growth exert a positive effect on the real exchange rate over the 15 year period, except for the fifth and sixth years. Nonetheless, a shock to economic growth has a huge positive impact on the real exchange rate while a shock to real tourism receipts has little impact on the real exchange rate, especially from year 8 onwards.

In summary, the results derived from variance decomposition test strongly suggest that tourism is an important engine to Malaysia's economic growth, particularly in the long-run. Furthermore, the results of the impulse response function test illustrate that tourism has a positive effect on Malaysia's economic growth over both the short- and long-run.

3.4 Concluding Remarks

This study attempted to investigate the validity of the tourism-led growth hypothesis in Malaysia at the aggregate level. The sample period of this study was from 1975 to 2010. The newly developed combined cointegration and the Granger causality tests in complement with the variance decomposition and impulse response function tests were utilised to achieve the objectives of this study.

The main findings of this study are as follows. First, the combined cointegration tests indicate the existence of a long-run equilibrium relationship between economic growth, real tourism receipts and real exchange rate in Malaysia. Second, to enhance the robustness of the findings, three long-run estimators, namely ARDL, DOLS and FMOLS were used to estimate long-run elasticities. It was observed that real tourism receipts had a significant positive effect on economic growth while the real exchange rate had a significant negative effect on economic growth in Malaysia.

Third, the Granger causality test was used to examine the direction of causality between the variables. In the short-run, the results show evidence of a bi-directional Granger causality between economic growth and real exchange rate. In addition, a uni-directional Granger causality running from real tourism receipts to economic growth and real exchange rate was also observed. However, in the long-run, this study found

evidence of a bi-directional causality among variables in the system. Fourth, the variance decomposition and impulse response function tests were conducted to analyse the response of each variable as to whether its variations are attributable to its own shock or to shocks in other variables within the system. This is also known as the variable-specific shock. In explaining shocks to economic growth in Malaysia, real tourism receipts played a more important role than the real exchange rate, particularly in the long-run. In addition, the results of the impulse response function test revealed that a shock to real tourism receipts had a positive effect on economic growth. Therefore, it can be concluded that tourism could be an effective catalyst to Malaysia's long-term economic growth.

Two significant policy implications are derivable from the findings of this study. First, tourism is potentially a reliable source of economic growth as the findings suggest that real tourism receipts Granger-cause economic growth over both the short- and long-run. This means that policymakers should focus on the development of the tourism industry in order to ensure long-term economic growth. In order to optimise the potential benefits of tourism-led growth, the Ministry of Tourism should offer more competitive tourism packages to woo more genuine tourist arrivals from various countries. Apart from that, the issues of security and public health must also be accorded due to tourist arrivals are very sensitive to both security issues and health scares as indicated in several studies. Amongst them, Tang (2011) highlighted the fact that, crime negatively affects international tourist arrivals to Malaysia while Lean and Smyth (2009) showed that issues related to public safety and health (e.g. high crime rates, bombings as in Bali in Indonesia, the SARS outbreak, avian flu outbreak, and cholera outbreak) would adversely affect international tourist arrivals. Our findings also indicate that real exchange rate had a negative effect on tourism thus implying that a stable real exchange

rate is important to avoid exchange rate risks being borne by international tourists. Ultimately, all these measures will attract more international tourist arrivals and further stimulate Malaysia's economic growth.

CHAPTER 4:

IS TOURISM-LED GROWTH HYPOTHESIS VALID AND STABLE IN MALAYSIA? A VIEW FROM DISAGGREGATED TOURISM MARKETS [10]

4.1 Introduction

Affirmation of the tourism-led growth hypothesis is of utmost importance as it can significantly assist policymakers in devising appropriate tourism and growth policies. Although tourism is one of the rapidly growing service sectors in the global economy, its contribution to economic growth has been a subject of intense debate. Many studies have established that tourism expansion Granger-causes economic growth through its positive impact on foreign exchange earnings, employment opportunities, tax revenues and other potential benefits (Archer, 1995; Gunduz and Hatemi-J, 2005; Kim, Chen and Jang, 2006; Lean and Tang, 2010; Lee and Hung, 2010; West, 1993). Therefore, many researchers concluded that economic growth of a country can be sustained via the expansion of the tourism sector. However, this conclusion may be too optimistic. This is because the utilisation of aggregated international tourist arrivals dataset is prone to the aggregation bias problem, especially when not all arrivals are genuine tourists who significantly contribute to economic growth. Moreover, evidence of tourism-led growth based on aggregated data may offer little guidance for policymakers when formulating tourism marketing strategies and economic growth policies (see also Oh, 2005). Apart from the aggregation bias problem, Lean and Tang (2010) suggested that there is also a need to examine the stability of the tourism-led growth hypothesis as the relevant causal relationships may not be stable owing to frequent changes in the global environment.

[10] The main ideas of this analytical chapter have been published in two reputable tourism journals, namely *International Journal of Tourism Research* and *Tourism Management*.

This study seeks to investigate the relationship between tourism and economic growth in Malaysia using disaggregated tourism market datasets to mitigate issues related to the aggregated data bias problem. In addition, this study adopts a novel approach in examining the stability of the tourism-led growth hypothesis by utilising disaggregated tourism market datasets. To the best of our knowledge, this is the first attempt to investigate the stability of the tourism-led growth hypothesis with disaggregated data. By doing so, the results of this study may not only provide a comprehensive insight into the role of each tourism market in Malaysia's economic growth but also shed light on the stability of each tourism market in stimulating economic growth. It is envisaged that the findings of this study may provide precise information to policymakers when formulating policies to promote tourism development in order to stimulate economic growth. In addition, the findings of this study will also enable them to target the specific tourism markets that contribute towards economic growth.

In order to achieve the aforementioned objectives, this study will determine the presence of a cointegration relationship between tourism and economic growth in Malaysia using the newly developed combined cointegration test introduced by Bayer and Hanck (2010, 2013). One of the advantages of the combined cointegration test lies in its ability to generate more conclusive results compared with existing individual cointegration tests. In fact, Gregory, Haug and Lomuto (2004) maintained that the cointegration results of individual tests are typically inconclusive because the *p*-values of different tests are imperfectly correlated. Next, the Granger causality test will be conducted to examine the direction of causality between Malaysia's economic growth and international tourist arrivals from different tourism markets. Finally, the recursive regression procedure will be incorporated into the Granger causality test to verify the

stability of the tourism-led growth hypothesis in Malaysia with respect to different tourism markets.

The rest of the chapter is organised as follows. Section 4.2 touches on the empirical model, data and econometric techniques used in this study. Section 4.3 reports and discusses the empirical results while the concluding remarks are presented in Section 4.4.

4.2 Methodology

This section will outline the methodology employed in the study.

4.2.1 Empirical Model and Data

Numerous studies have been conducted to determine the engines of growth using the growth accounting framework. With regard to the tourism-led growth hypothesis, researchers have utilised a variety of model specifications to validate the hypothesis. Among them, the model proposed by Balaguer and Cantavella-Jorda (2002) is one of the most popular models utilised to analyse the tourism-led growth hypothesis. In fact, Balaguer and Cantavella-Jorda (2002) suggested that real exchange rate is an important variable that must be included because it influences both international tourism and economic growth. This postulation was also affirmed by Katircioğlu (2009b, 2011). In keeping with these recommendations, this study will examine the validity of the tourism-led growth hypothesis in Malaysia by using the following tri-variate model:

$$\ln Y_t = \beta_0 + \beta_1 \ln VA_t + \beta_2 \ln RER_t + \varepsilon_t \quad (4.1)$$

where ln denotes the natural logarithm, Y_t is the output level, VA_t is international tourist arrivals from the *i*th tourism markets, and RER_t is the real exchange rate. The residuals (ε_t) are assumed to be normally distributed and white noise.

This study employs monthly data from January 1995 to December 2010 of the Industrial Production Index (IPI, 2000 = 100), real effective exchange rate (RER, 2000 = 100) and disaggregated categories of international tourism markets. The disaggregated tourism markets include international tourist arrivals from Australia, Brunei, China, Germany, Indonesia, Japan, Korea, Singapore, Taiwan, Thailand, the United Kingdom (UK) and the United States (USA). The data used in this study were collected from the International Financial Statistics (IFS) published by the International Monetary Fund (IMF) and the CEIC database. All variables were transformed into the natural logarithm, so that they can be interpreted in growth terms after first difference.

4.2.2 Unit Root Test

Narayan and Popp (2010) proposed two endogenous break models to investigate the null hypothesis of a unit root. Model M1 allows for two structural breaks in the intercept, while Model M2 allows for two structural breaks in both the intercept and the slope of the trend function. The models for testing the two structural breaks unit root are stated as follows:

Model M1: $y_t = \kappa + \alpha y_{t-1} + \beta t + \varphi_1 D(T_B)_{1,t} + \varphi_2 D(T_B)_{2,t} + \theta_1 DU_{2,t-1}$

$$+\theta_2 DU_{2,t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + e_{1t} \tag{4.2}$$

Model M2: $y_t = \kappa + \alpha y_{t-1} + \beta t + \varphi_1 D(T_B)_{1,t} + \varphi_2 D(T_B)_{2,t} + \theta_1 DU_{1,t-1} + \theta_2 DU_{2,t-1}$

$$+\phi_1 DT_{1,t-1} + \phi_2 DT_{2,t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + e_{2t} \tag{4.3}$$

Where, Δ is the first difference operator, p is the optimal lag length and the residuals e_{it} are assumed to be normally distributed and white noise. $DU_{i,t} = 1(t > T_{B,i})$ and $DT_{i,t} = 1(t > T_{B,i})(t - T_{B,i}),\ \ i = 1, 2,$ denote the dummy variables for breaks in the intercept, while the slope of the trend function occur at time T_{B1} and T_{B2}, respectively. The t-statistic of y_{t-1} can be used to examine the null hypothesis of a unit root against the alternative hypothesis of stationary. Finally, potential break dates $(T_{B1},\ T_{B2})$ can be chosen simultaneously using grid search or sequential procedures as is discussed in Narayan and Popp (2010).

4.2.3 Combined Cointegration Test

Perman (1991) documented that a model is well-specified if the variables in it are cointegrated. Therefore, testing for cointegration is essential not only to verify true causal relationships, but it is also required to determine the appropriateness of the model. The idea of cointegration and the residual-based testing procedure for cointegration originated from Engle and Granger (EG, 1987). Since then, a large number of studies have applied this procedure while others have developed alternative testing procedures for cointegration. Renowned tests for cointegration include the system-based test of Johansen (JOH, 1988), the ECM-based F-test of Boswijk (BO,

1994) and the ECM-based *t*-test of Banerjee, Dolado and Mestre (BDM, 1998). Nonetheless, cointegration test results are very sensitive to the choice of techniques because no one technique is perfect and completely robust in all applications (Elliott, Jansson and Pesavento, 2005; Gregory, Haug and Lomuto, 2004). To enhance the power of the cointegration test, the newly-developed cointegration technique as suggested by Bayer and Hanck (2010, 2013) will be used to investigate the presence of cointegration between tourism and economic growth in Malaysia. A uniqueness of this new test is that it allows us to combine various individual cointegration test results to generate a conclusive finding. With respect to this, Bayer and Hanck (2010, 2013) utilised the following Fisher's formulae to combine the *p*-values of different individual cointegration tests:

$$EG\text{-}JOH = -2\left[\ln\left(p_{EG}\right)+\ln\left(p_{JOH}\right)\right] \tag{4.4}$$

$$EG\text{-}JOH\text{-}BO\text{-}BDM = -2\left[\ln\left(p_{EG}\right)+\ln\left(p_{JOH}\right)+\ln\left(p_{BO}\right)+\ln\left(p_{BDM}\right)\right] \tag{4.5}$$

Here p_{EG}, p_{JOH}, p_{BO} and p_{BDM} are the *p*-values of Engle-Granger (EG), Johansen (JOH), Boswijk (BO), and Banerjee-Dolado-Mestre (BDM) cointegration tests, respectively.[11] If the calculated Fisher statistic exceeds the critical value tabulated in Bayer and Hanck (2010), the null hypothesis of no cointegration is rejected.

[11] Interested readers can refer to Maddala and Kim (1998) for detailed testing procedures of the individual cointegration tests.

4.2.4 Granger Causality Test

The Granger causality test is used to determine the direction of causality between tourism and economic growth. If the variables are non-cointegrated, one can establish their short-run causal relationship using the first difference vector autoregressive (VAR) framework. However, Granger (1988) postulated that if the variables were found to be cointegrated, the Granger causality test conducted within the first difference VAR framework would be misleading due to ignoring the long-run information. In such circumstances, the Granger causality tests should be conducted using the Error-Correction Model (ECM) as outlined below:

$$\Delta \ln Y_t = a_0 + \pi_1 ECT_{t-1} + \sum_{k=1}^{p} a_{1k} \Delta \ln Y_{t-k} + \sum_{k=1}^{q} a_{2k} \Delta \ln VA_{i,t-k} + \sum_{k=1}^{r} a_{3k} \Delta \ln RER_{t-k} + e_{1t} \quad (4.6)$$

$$\Delta \ln VA_{i,t} = b_0 + \pi_2 ECT_{t-1} + \sum_{k=1}^{p} b_{1k} \Delta \ln VA_{i,t-k} + \sum_{k=1}^{q} b_{2k} \Delta \ln Y_{t-k} + \sum_{k=1}^{r} b_{3k} \Delta \ln RER_{t-k} + e_{2t} \quad (4.7)$$

where ln is the natural logarithm, Δ is the first difference operator, Y_t is the output level and $VA_{i,t}$ refers to international tourist arrivals from the *i*th tourism markets. The residuals (e_{1t}, e_{2t}) are assumed to be white noise and normally distributed. ECT_{t-1} is a one period lagged error-correction term calculated from the long-run equation. If the variables are cointegrated, the causal relationships can be segregated into short- and long-run. For short-run Granger causality, it can be tested by restricting the first difference lagged explanatory variables with the likelihood ratio (LR) test. For example, from equation (4.6), $a_{2k} \neq 0 \ \forall_k$ implies that causality runs from tourism to economic growth, while from equation (4.7), $b_{2k} \neq 0 \ \forall_k$ indicates that economic growth Granger-causes tourism. For the case of long-run Granger causality, this study will test the null

hypothesis of $a_{2k} = \pi_1 = 0$ using the LR test. Rejection of this hypothesis would imply that there exists an overall long-run Granger causality running from tourism to economic growth. Similarly, if the null hypothesis of $b_{2k} = \pi_2 = 0$ was rejected, it would imply that there is an overall long-run Granger causality running from economic growth to tourism.

4.3 Empirical Results

The empirical results of this analytical chapter will be delineated in the following sub-sections.

4.3.1 Unit Root Results

Before cointegration analysis commenced, this study employs the Augmented Dickey-Fuller (ADF) unit root test to check the order of integration of each series. Table 4.1 reports the results of the ADF test at level and first difference. At level, none of the variables reject the null hypothesis of a unit root at the 5 per cent significance level, except for tourist arrivals from Taiwan. Nevertheless, at first difference, the ADF statistics reject the null hypothesis of a unit root in the selected variables at the 1 per cent significance level. Therefore, the results of the ADF test suggest that tourist arrivals from Taiwan follow the *I*(0) process while the remaining variables adhere to the *I*(1) process.

Table 4.1: The Results of ADF Unit Root Test

Variables	Augmented Dickey-Fuller (ADF)	
	Level	First difference (Δ)
$\ln Y_t$	–3.066 (13)	–3.633 (14)**
$\ln RER_t$	–2.113 (3)	–6.682 (2)***
Australia	–1.613 (14)	–5.797 (13)***
Brunei	–2.318 (14)	–4.896 (13)***
China	–3.332 (8)	–8.078 (7)***
Germany	–1.612 (11)	–9.048 (10)***
Indonesia	–3.251 (4)	–8.437 (5)***
Japan	–2.774 (12)	–5.576 (11)***
Singapore	–3.270 (5)	–6.199 (10)***
South Korea	–2.354 (4)	–11.047 (3)***
Taiwan	–7.150 (0)***	–7.902 (8)***
Thailand	–2.470 (4)	–6.383 (10)***
UK	–2.854 (9)	–7.966 (10)***
USA	–2.652 (11)	–4.286 (14)***

Note: The asterisks *** and ** represent statistical significance at the 1 and 5 per cent levels, respectively. The optimal lag length for ADF test is selected using the general-to-specific approach applied to the t-statistics. Figures in parentheses ( ) denote the optimal lag length.

The design of the ADF unit root test is principally based on the assumption that there is no structural break in the series. In light of this, the results of the ADF test may be biased if the series confronted a structural break. To circumvent this problem, this study performed the Narayan-Popp unit root test with two structural breaks to confirm the order of integration of each series. Table 4.2 presents the results of Narayan-Popp unit root test. Unlike the results of the ADF test, at the 5 per cent significant level, none of the Narayan-Popp test statistics reject the null hypothesis of a unit root, including tourist arrivals from Taiwan. Therefore, it can be concluded that all variables are integrated of the order one, *I*(1). This result is consistent with the findings of Nelson and Plosser (1982) which noted that most macroeconomic variables are non-stationary at level and become stationary after taking first difference.

Table 4.2: The Results of Narayan-Popp Unit Root Tests with Two Structural Breaks

Variables	Models for unit root test with two structural breaks					
	M1			M2		
	TB1	TB2	Test statistics	TB1	TB2	Test statistics
$\ln Y_t$	1998:M1	2007:M1	–2.461 (5)	1998:M1	2007:M1	–3.692 (5)
$\ln RER_t$	1998:M4	1998:M8	–2.121 (7)	1998:M8	2005:M2	–1.821 (7)
Australia	1999:M12	2001:M10	–2.585 (11)	1998:M3	1999:M12	–1.954 (12)
Brunei	1999:M8	2003:M12	–1.980 (11)	1999:M8	2003:M12	–1.816 (11)
China	2003:M4	2003:M7	–3.718 (8)	2001:M10	2003:M4	–4.094 (8)
Germany	1997:M3	1998:M1	–1.410 (11)	1997:M3	1998:M2	–1.610 (11)
Indonesia	2000:M6	2003:M4	–2.140 (12)	1998:M12	2000:M7	–2.589 (12)
Japan	2003:M3	2003:M8	–3.104 (11)	1998:M7	2003:M3	–3.216 (12)
Singapore	1998:M8	2003:M3	–3.681 (11)	2001:M9	2003:M3	–2.910 (11)
South Korea	1997:M3	1998:M1	–2.556 (4)	1997:M3	1998:M1	–2.498 (4)
Taiwan	1998:M6	2003:M3	–4.165 (12)	1998:M6	2003:M3	–4.405 (12)
Thailand	1997:M3	1998:M1	–1.338 (11)	1997:M4	1998:M1	–1.393 (11)
UK	1997:M3	1998:M1	–1.944 (11)	1997:M3	1998:M2	–2.225 (10)
USA	1997:M3	1998:M1	–3.188 (12)	1997:M3	1998:M1	–3.183 (12)

Significance level	Critical values	Critical values
1 per cent	–4.958	–5.576
5 per cent	–4.316	–4.937

Note: The optimal lag length for Narayan-Popp test is selected using the general-to-specific approach applied to the t-statistics. Figures in parentheses ( ) denote the optimal lag length. The critical values are collected from Narayan and Popp (2010). GAUSS programming code has been used to perform the above unit root test.

4.3.2 Combined Cointegration Results

After performing the unit root tests to investigate the order of integration of each series, the next step involved examining the existence of a cointegration relationship. According to Engle and Granger (1987), two series are said to be cointegrated if the series are integrated at the same order and their linear combination is stationary. Since all variables are integrated of order one, *I*(1), the combined cointegration test as proposed by Bayer and Hanck (2010, 2013) was then applied to ascertain the existence of a long-run equilibrium relationship between tourism, economic growth and real exchange rate in Malaysia. Table 4.3 exhibits the results of the combined cointegration test statistics – EG-JOH and EG-JOH-BO-BDM.

Table 4.3: The Results of the Combined Cointegration Tests

Tourism markets	Fisher statistics		
	EG-JOH	EG-JOH-BO-BDM	Conclusion
Australia	13.564**	19.409*	Cointegrated
Brunei	19.823***	45.574***	Cointegrated
China	24.742***	56.613***	Cointegrated
Germany	24.098***	51.651***	Cointegrated
Indonesia	18.663***	37.124***	Cointegrated
Japan	13.109**	27.615**	Cointegrated
Singapore	11.852**	28.616**	Cointegrated
South Korea	11.993**	25.571**	Cointegrated
Taiwan	28.653***	65.494***	Cointegrated
Thailand	12.343**	29.701**	Cointegrated
UK	19.790***	47.342***	Cointegrated
USA	13.330**	30.702**	Cointegrated
Significance level	Critical values		
1 per cent	16.720	32.601	
5 per cent	10.858	21.342	
10 per cent	8.451	16.507	

Note: ***, ** and * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. EG-JOH is the combination of two cointegration tests developed by Engle and Granger (EG, 1987) and Johansen (JOH, 1988). EG-JOH-BO-BDM is the combination of four cointegration tests developed by Engle and Granger (EG, 1987), Johansen (JOH, 1988), Boswijk (BO, 1994) and Banerjee, Dolado and Mestre (BDM, 1998).

There are two forms of combined cointegration tests – EG-JOH and EG-JOH-BO-BDM obtained from the Fisher's statistics calculation. For the case of EG-JOH, the results show that the statistics were consistently greater than the 5 per cent critical values for all selected tourism markets. Therefore, the results of the EG-JOH combined cointegration test suggest that Malaysia's economic growth is cointegrated with tourist arrivals from the 12 major tourism markets. Alternatively, the EG-JOH-BO-BDM combined cointegration test results reveal that tourist arrivals from Australia may not be cointegrated with Malaysian's economic growth at the 5 per cent significance level. Nonetheless, the EG-JOH-BO-BDM statistics rejected the null hypothesis of no cointegration at the 10 per cent level for all selected tourism markets. Therefore, it can be inferred that economic growth, tourism and real exchange rate in Malaysia are cointegrated regardless of tourism market, implying that a long-run relationship exists between Malaysia's economic growth, tourism and real exchange rate.[12] These results are synchronous with the findings of Balaguer and Cantavella-Jordá (2002), Dritsakis (2004), Brida, Carrera and Risso (2008) and Katircioğlu (2009b, 2011).

Given the existence of cointegration between economic growth, tourism and real exchange rate in Malaysia, the next step is to estimate the long-run coefficients using the Fully Modified OLS (FMOLS) estimator. The estimated long-run coefficients are summarised in Table 4.4. From the estimated results, this study finds that the long-run coefficients for tourist arrivals $\left(\ln VA_t\right)$ to Malaysia from the 12 major tourism markets are consistently positive and statistically significant at the 5 per cent level or better. This implies that tourism is positively related to economic growth in Malaysia. The long-run coefficients for $\ln VA_t$ are ranged from 0.08 to 0.22, which means that a 10 per cent

[12] The order of integration for tourist arrivals from Taiwan is either *I*(0) or *I*(1) process. For robustness, the presence of a long-run equilibrium relationship between Malaysia's economic growth, tourist arrivals from Taiwan and real exchange rate was re-examined using the bounds testing approach to cointegration. The results show that the variables are cointegrated, thus affirming that the results presented in Table 4.3 are robust. The full results for Taiwan are reported in Table B.1 of Appendix B.

increase in tourist arrivals, plausibly enhances Malaysia's economic growth from approximately 0.8 per cent to 2.2 per cent.

Table 4.4: The Results of Long-Run Coefficients (FMOLS)

Tourism markets	Constant	$\ln VA_t$	$\ln RER_t$
Australia	6.0399***	0.1320***	–0.5892***
Brunei	6.0732***	0.1040***	–0.5485***
China	5.7645***	0.1021***	–0.4773***
Germany	7.8028***	0.0957***	–0.8673***
Indonesia	5.1817***	0.1057***	–0.3738***
Japan	7.3932***	0.1243***	–0.8758***
Singapore	3.8255***	0.1987***	–0.3998***
South Korea	6.7080***	0.1134***	–0.6722***
Taiwan	8.2594***	0.0842**	–0.9638***
Thailand	2.8004***	0.2212***	–0.1508
UK	6.6189***	0.1271***	–0.7033***
USA	4.9307***	0.2151***	–0.5042***

Note: The asterisks *** and ** denote significance at the 1 and 5 per cent levels, respectively.

The findings also reveal that the real exchange rate is negatively related to economic growth in Malaysia for all tourism markets under review. In addition, real exchange rate is also statistically significant at the 1 per cent level for all tourism markets, except Thailand. Specifically, the long-run coefficients for real exchange rate are ranged from –0.37 to –0.96. This implies that holding other factors constant, a 10 per cent increase in the real exchange rate (i.e. appreciation of the Malaysian Ringgit), reduces Malaysia's economic growth to within the 3.7 per cent to 9.6 per cent range.

4.3.3 Full Sample Granger Causality Results

Given that the variables are cointegrated, there must be at least one Granger causality direction to explain the existence of the long-run equilibrium relationship. Table 4.5

reports the short- and long-run Granger causality results within the ECM framework.[13] The finding suggests that all tourism markets under review support the economic growth-led tourism hypothesis in the long-run, while in the short-run only 5 tourism markets, namely, China, Germany, Japan, Thailand and the United Kingdom support this hypothesis at the 5 per cent significance level. As Malaysia is one of the fastest growing economies in Southeast Asia and has attracted much business travel besides creating employment opportunities for other low-middle-income countries in the region, it is unsurprising that the results strongly support the economic growth-led tourism hypothesis.

Table 4.5: The Results of Granger Causality Tests

Tourism Markets	Tourism-led growth hypothesis		Growth-led tourism hypothesis	
	Short-run causality	Long-run causality	Short-run Causality	Long-run causality
Australia	2.431	14.360***	3.704	16.444***
Brunei	0.280	9.830***	10.142	23.447***
China	0.998	4.185	20.359***	48.742***
Germany	7.035**	15.136***	39.965***	69.874***
Indonesia	0.639	4.009	0.027	23.288***
Japan	0.510	9.799***	38.259***	61.200***
Singapore	1.175	13.188***	0.045	16.605***
South Korea	0.207	8.727**	4.563	29.650***
Taiwan	1.050	10.677***	7.898	65.457***
Thailand	51.717***	60.472***	18.131***	33.420***
UK	3.458	12.976***	13.415***	39.112***
USA	2.693	11.269**	2.040	27.529***

Note: The asterisks *** and ** denote statistically significance at 1 and 5 per cent level, respectively. The optimal lag order is determined by using AIC.

[13] This study conducted several diagnostic tests on the ECM equations. The results show that the ECM equations for Granger causality test are free from serial correlation and ARCH problems. In addition, the residuals are spherically distributed and the Ramsey RESET test indicates no misspecification error. Therefore, Granger causality tests based upon the ECM equations are valid and reliable. The diagnostic tests results are reported in Table B.2 of Appendix B.

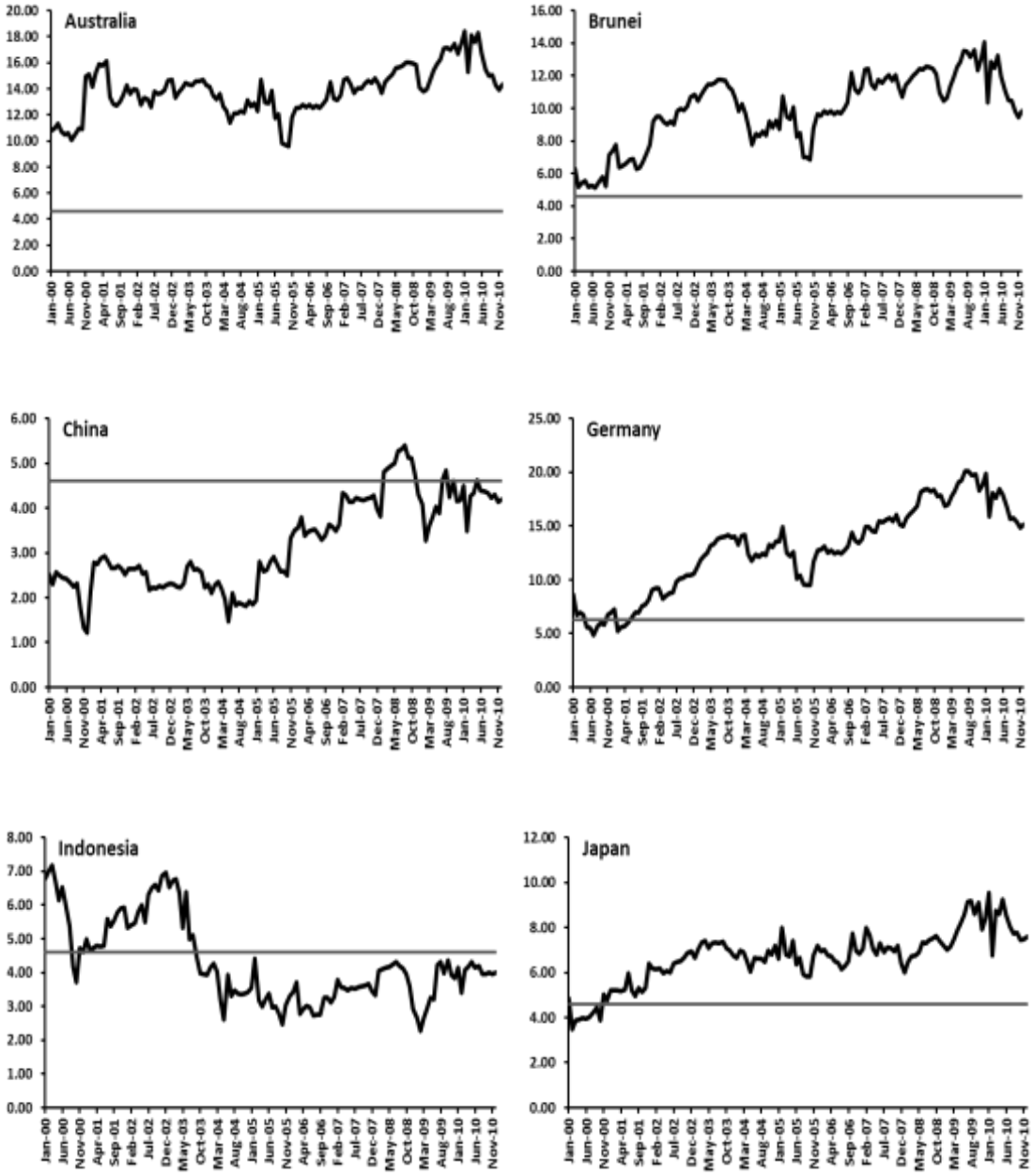
In terms of the tourism-led growth hypothesis, the results show that of the 12 tourism markets under investigation, only 2 international tourism markets, namely, Germany and Thailand Granger-cause economic growth in the short-run, while 10 out of the 12 international tourism markets such as Australia, Brunei, Germany, Japan, Singapore, South Korea, Taiwan, Thailand, the United Kingdom and the United States are found to Granger-cause economic growth in the long-run. In contrast, 2 out of the 12 international tourism markets, that is, China and Indonesia did not Granger-cause economic growth in both the short- and long-run.[14] Even though the findings generally show support for the tourism-led growth hypothesis in Malaysia, this particular finding implies that not all international tourism markets contribute to economic growth. Therefore, high rates of tourist arrivals are not necessarily associated with high rates of tourism earnings because not all arrivals are genuine tourists.

4.3.4 Recursive Regression-based Granger Causality Results

In accord with Thoma (1994), Lee (1997), Tang (2008, 2010b) and Lean and Tang (2010), the stability of the causal relationships is tested. As Malaysia's economic growth is cointegrated with tourist arrivals from all selected tourism markets, the recursive Granger causality test was performed on equation (4.6) to ascertain the stability of the tourism-led growth hypothesis in Malaysia. Generally, the recursive Granger causality tests are conducted by setting the initial sample size T and by adding a new observation to the end of the sample (i.e. $T+1$). For example, if the initial setting is 5 years, i.e., T = 60 observations, the first Granger causality test statistic is obtained

[14] This probably indicates that tourist arrivals from China and Indonesia are less likely to be the genuine tourists as a point raised by Kassim (1997). Moreover, Lee (2013) reported that China and Indonesia are the contributors of illegal workers in Malaysia. Apart from that, Samad (2012) revealed that 3175 tourists from Indonesia and approximately 3000 tourists from China were denied entry to Malaysia because the custom officers suspect that they may have other intentions apart from visiting the country. Since tourist arrivals from China and Indonesia are more likely to be non-genuine, it is plausible to find that tourist arrivals these countries do not Granger-cause Malaysia's economic growth.

by using a sub-sample period from 1995:M1 to 2000:M1 (i.e. T = 60 observations). Next, the second test statistic is obtained by using data from 1995:M1 to 2000:M2. This process will continue until the last observation is included. The null hypothesis that postulates tourism does not Granger-cause economic growth is rejected if the LR test statistics for $\left(H_0 : a_{2k} = \pi_1 = 0\right)$ exceed the 10 per cent critical value. This means that a large number of LR test statistics fluctuating above the cut-off line would be observable if the tourism-led growth hypothesis in Malaysia is valid and stable.



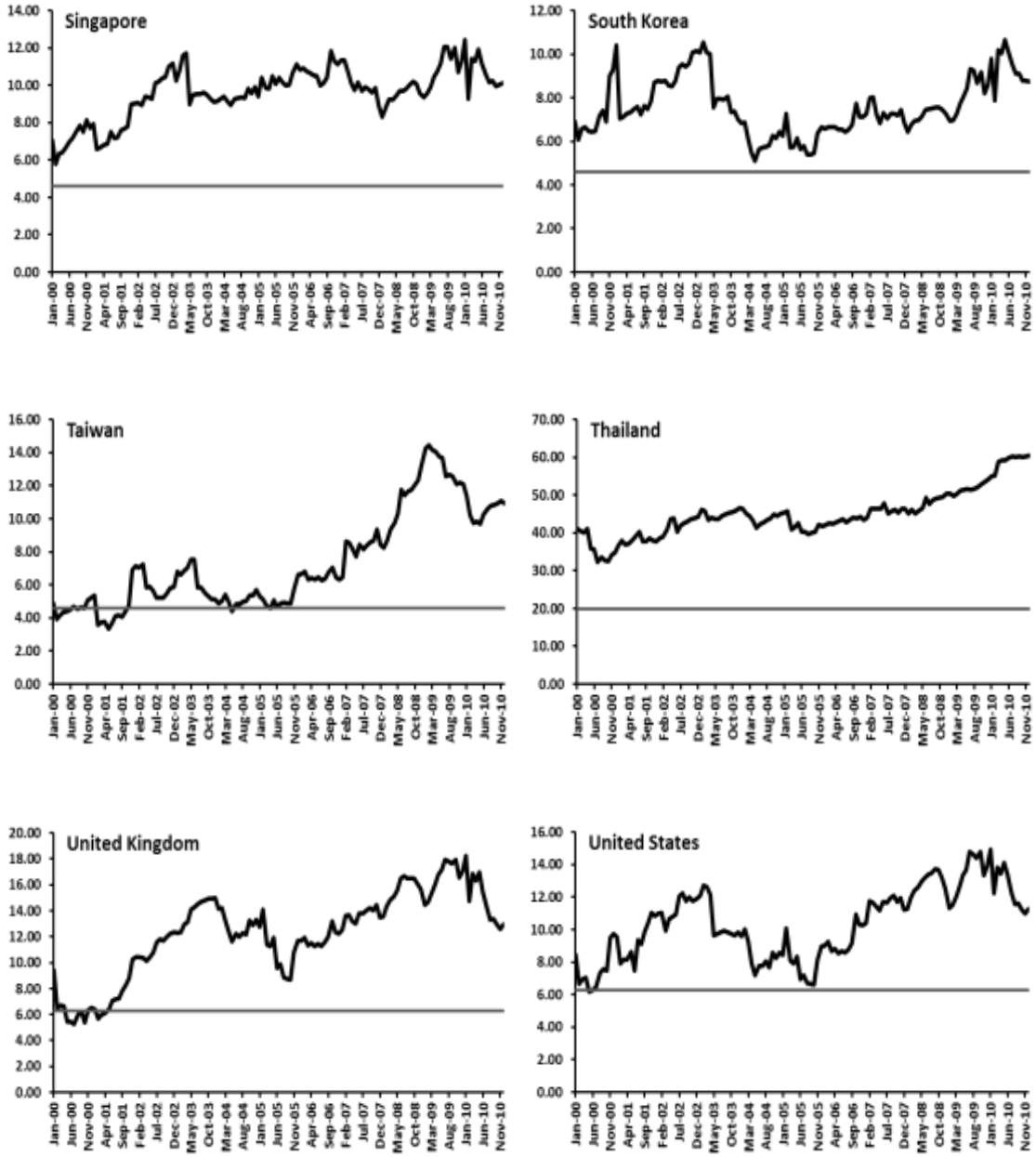


Figure 4.1: Plots of the Recursive Granger Causality Tests

The plots of the recursive Granger causality test statistics and a summary of rejection frequencies are presented in Figure 4.1 and Figure 4.2, respectively. The plots reveal that the stability of the tourism-led growth hypothesis varies among tourism markets. Specifically, this study finds that tourist arrivals from developed countries are more likely to support the tourism-led growth hypothesis over time. For example, a substantial portion of the recursive LR statistics for Australia, Brunei, Germany, Japan,

Singapore, South Korea, Taiwan, Thailand, the United Kingdom and the United States fluctuate above the 10 per cent cut-off line, particularly after 2000. Figure 4.2 illustrates that the lowest rejection frequency amongst these tourism markets is 86.36 per cent. More pertinently, the rejection frequencies for Australia, Brunei, Singapore, South Korea and Thailand are 100 per cent. This finding implies that international tourist arrivals from these developed economies are more likely to stimulate Malaysia's economic growth.[15]

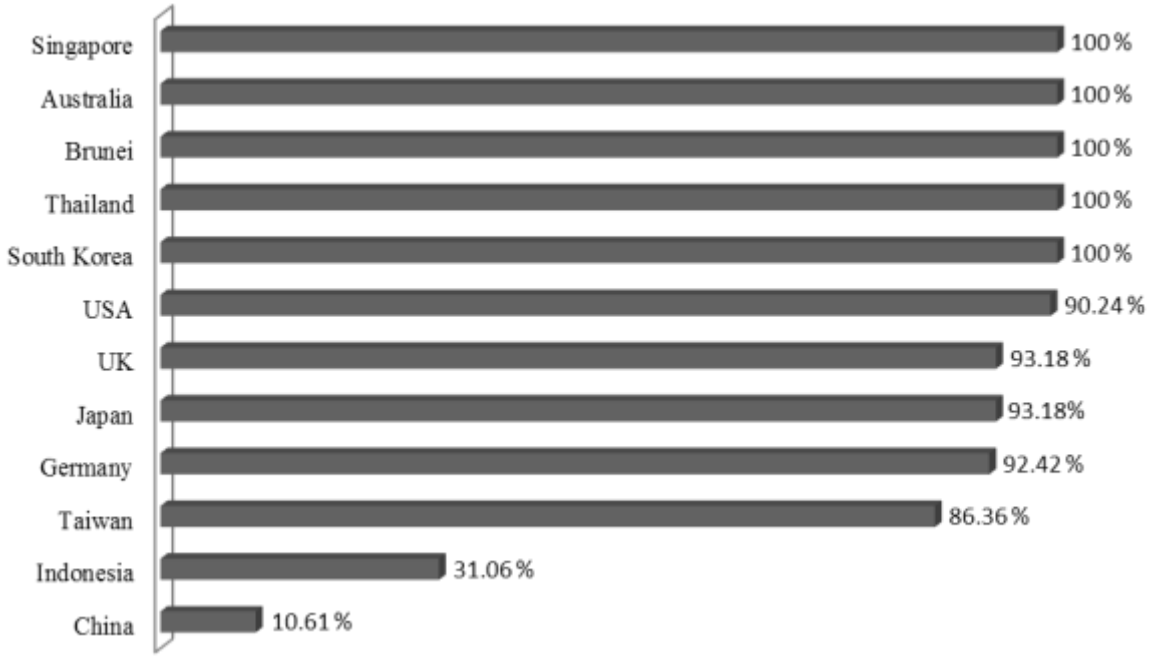


Figure 4.2: Summary of Rejection Frequencies of the Recursive Granger Causality Tests

[15] As a sensitivity check, we also perform the time-varying Granger causality test based upon rolling regression procedure. Likewise, the results also show that tourist arrivals from China and Indonesia are less likely to support the tourism-led growth hypothesis in Malaysia. In addition, tourist arrivals from the rest of the tourism markets are more likely to boost Malaysia's economic growth, thus support the tourism-led growth hypothesis. In light of this, we may able to conclude that our causality results are fairly robust. The full results for rolling regression-based Granger causality test are not reported here, but they are available in Figure B.1 and Figure B.2 of Appendix B.

In contrast, Figure 4.1 shows that the support for the tourism-led growth hypothesis is relatively weak with respect to China and Indonesia because the recursive LR statistics related to these tourism markets tend to fluctuate more frequently below the 10 per cent cut-off line. The rejection frequencies for these tourism markets only range from 10.61 to 31.06 per cent, implying that the tourism-led growth hypothesis is weak and unstable. Based upon the overall results, it can be concluded that tourism does function as an engine of growth though not all tourism markets contribute to the economic growth of Malaysia. In fact, among the 12 tourism markets analysed, 10 support the tourism-led growth hypothesis.

There are two potential explanations for the disparity among the different countries, especially for tourist arrivals from China and Indonesia. Firstly, the number of tourist arrivals from those countries could be insufficient to have a significant impact on Malaysia's economic growth.[16] The second potential explanation as highlighted by Kassim (1997) relates to the fact that many informal agents bring in illegal workers to Malaysia through the tourism channel thus making it almost impossible to differentiate between genuine tourists and those coming for business and jobs. For example, the Illegal Immigrant Comprehensive Settlement Programme implemented by the Malaysian government in 2011 found 2.1 million illegal foreign workers in Malaysia. Therefore, a country may experience a high volume of tourist arrivals, but low rate of tourism earnings because not all arrivals are genuine tourists.

[16] We appreciate an anonymous reviewer's from *Tourism Management* who suggested that the disparity in causality evidence among countries could be due to insufficient tourist arrivals.

4.3.5 Variance Decomposition and Impulse Response Function

In the previous sub-sections, we have critically appraised the role of tourism in Malaysia's economic growth based upon in-sample tests. In order to provide further insights about the impact of tourism on economic growth in Malaysia from the 12 major tourism markets, this study performed the forecast error variance decomposition analysis and the impulse response function. Variance decomposition analysis gives information about the relative strength or importance of a variable in relation to other variables in the system. In contrast, the impulse response function test attempts to provide the direction of response arising from a random shock impacting a variable in the system.

Table 4.6 exhibits the results of the analysis on the effect of economic growth, tourism and real exchange rate on Malaysia's economic growth over 60 months (i.e. 5 years). Generally, the variance decomposition results suggest that most of the variations in the forecast error variance for income are explained by its own shocks. Furthermore, this study finds that the real exchange rate is relatively more important than tourism in explaining the variations in Malaysia's economic growth, particularly in the short-run (i.e. 12 months). Nonetheless, over the long-run (i.e. 60 months), tourism is relatively more important than the real exchange rate in explaining the variations in Malaysia's income. The implied interpretation of this finding means that tourism is an effective long-term catalyst of growth. Among the 12 major tourism markets under review, the short-run results of variance decomposition analysis show that tourist arrivals from Australia, Brunei, China, Germany, Indonesia, the United Kingdom, and the United States explain less than 2 per cent of the variation in Malaysia's economic growth. This study also notices that tourist arrivals from Japan, Singapore, South Korea, Taiwan and

Thailand accounted for 2.17 per cent, 6.61 per cent, 7.39 per cent, 7.20 per cent and 16.09 per cent, respectively of the forecast error variance of Malaysia's economic growth.

Table 4.6: The Results of Variance Decomposition Analysis – Effects on Growth

Tourism Market	Horizon	Economic growth	Tourism	Exchange rate
Australia	1	98.44	0.90	0.66
	6	92.35	1.21	6.44
	12	86.34	1.12	12.54
	24	87.24	2.63	10.14
	48	77.91	13.17	8.92
	60	72.74	19.33	7.93
Brunei	1	98.31	0.05	1.64
	6	95.23	0.96	3.81
	12	91.87	1.98	6.15
	24	89.70	3.83	6.46
	48	88.07	6.03	5.90
	60	87.65	6.63	5.72
China	1	97.81	1.45	0.74
	6	91.34	1.10	7.55
	12	85.46	1.08	13.46
	24	87.41	1.43	11.16
	48	85.25	3.09	11.66
	60	85.30	3.65	11.05
Germany	1	98.92	0.16	0.92
	6	90.56	0.89	8.55
	12	81.76	1.96	16.28
	24	85.66	2.47	11.87
	48	77.81	11.23	10.96
	60	74.57	15.40	10.03
Indonesia	1	99.09	0.11	0.80
	6	93.56	0.39	6.05
	12	88.45	1.28	10.27
	24	88.53	1.57	9.90
	48	87.38	1.40	11.22
	60	87.91	1.33	10.76
Japan	1	99.36	0.01	0.63
	6	91.22	1.98	6.81
	12	84.25	2.17	13.58
	24	82.18	7.23	10.59
	48	75.85	15.02	9.13
	60	75.05	15.94	9.01

(Continue)

Table 4.6: The Results of Variance Decomposition Analysis – Effects on Growth

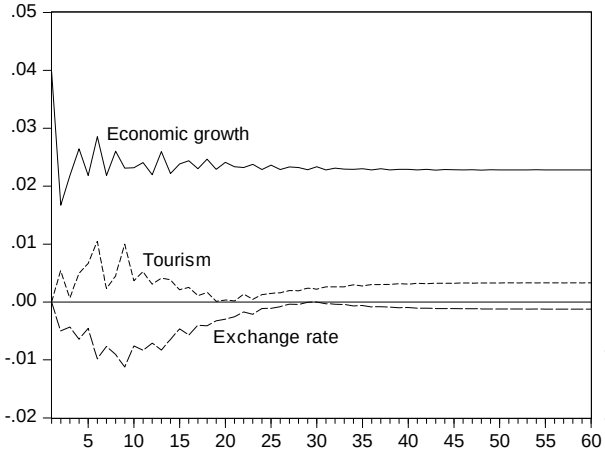
Tourism Market	Horizon	Economic growth	Tourism	Exchange rate
Singapore	1	99.24	0.23	0.53
	6	97.83	1.27	0.90
	12	91.59	6.61	1.80
	24	63.04	32.08	4.87
	48	41.95	43.05	15.00
	60	41.27	43.98	14.75
South Korea	1	99.17	0.36	0.47
	6	93.50	3.18	3.32
	12	87.66	7.39	4.95
	24	82.46	14.54	3.00
	48	70.14	26.05	3.80
	60	67.95	28.19	3.86
Taiwan	1	97.63	2.00	0.37
	6	86.96	2.07	10.97
	12	73.56	7.20	19.24
	24	71.52	13.70	14.78
	48	66.29	20.72	12.99
	60	66.08	21.28	12.64
Thailand	1	95.13	3.91	0.96
	6	81.20	13.26	5.54
	12	77.26	16.09	6.65
	24	62.92	26.86	10.22
	48	60.84	24.51	14.64
	60	60.92	24.22	14.86
UK	1	99.00	0.03	0.97
	6	90.40	0.49	9.11
	12	83.21	1.21	15.58
	24	85.27	3.14	11.59
	48	75.85	12.42	11.73
	60	73.20	16.04	10.76
USA	1	98.76	0.08	1.16
	6	88.85	1.08	10.06
	12	81.33	1.20	17.47
	24	85.25	1.50	13.25
	48	80.27	8.67	11.06
	60	77.73	11.38	10.89

Note: The Cholesky decomposition ordering: exchange rate, tourism and Economic growth

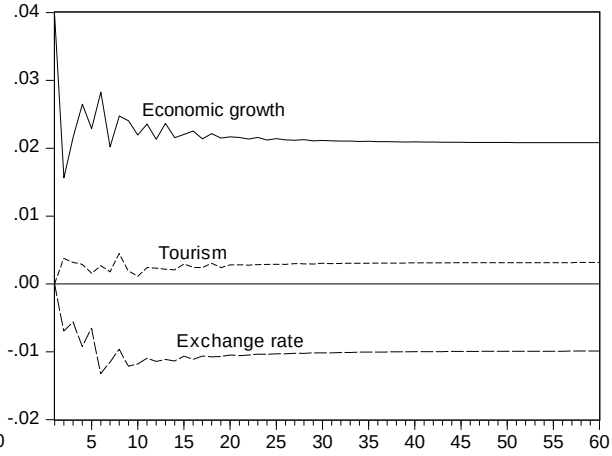
In the long-run (i.e. 60 months), the results of variance decomposition analysis suggest that tourist arrivals from China and Indonesia only explain 3.65 per cent and 1.33 per cent of the variation in Malaysia's economic growth, respectively while the figures of the other 10 nations range from as low as 11.38 to as high as 43.98. It can be inferred from these findings that tourist arrivals from China and Indonesia are relatively less important to Malaysia's economic growth over the short- and long-run when contrasted with tourist arrivals from Australia, Brunei, Germany, Japan, Singapore, South Korea, Taiwan, Thailand, the United Kingdom and the United States.

Next, this study used the impulse response function to investigate the impact of a one-standard deviation shock in economic growth, tourism and real exchange rate on Malaysia's income. Figure 4.3 illustrates the plot of impulse response functions over 60 months (i.e. 5 years periods). Generally, the results in Figure 4.3 highlight two salient features. First, the results indicate that Malaysia's economic growth responds positively to a shock in tourism while the real exchange rate has a negative effect on Malaysia's economic growth over 60 months. Second, the results also signal that the impact of tourism and real exchange rate on Malaysia's economic growth are likely to stabilise after 24 months. In addition to these prominent findings, the results also highlight the fact that the impact of tourist arrivals from Australia, Brunei, China, Indonesia, South Korea on Malaysia's economic growth is less conspicuous compared to the impact of tourist arrivals from other major tourism markets, namely Germany, Japan, Singapore, Taiwan, Thailand, the United Kingdom and the United States. Coincidentally, the large impact tourism markets are predominantly developed countries. In summary, the results obtained from the variance decomposition and impulse response function analyses seem consistent with the findings of the Granger causality tests. This illustrates the fact that

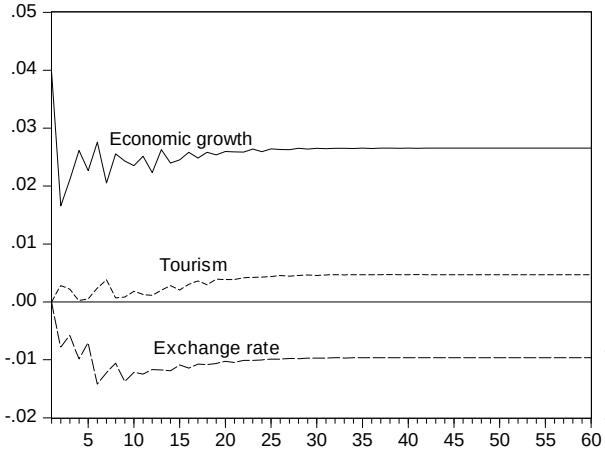
although the tourism-led growth hypothesis is valid in the Malaysian context, not all international tourism markets contribute significantly to economic growth.



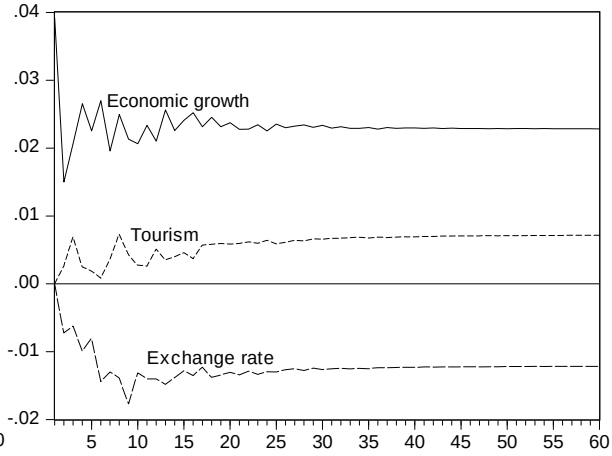
Australia



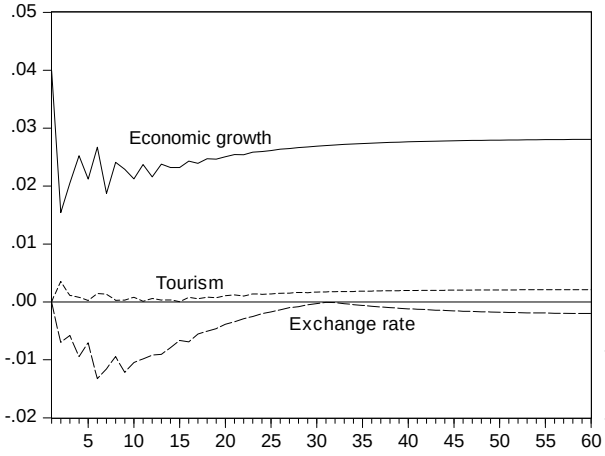
Brunei



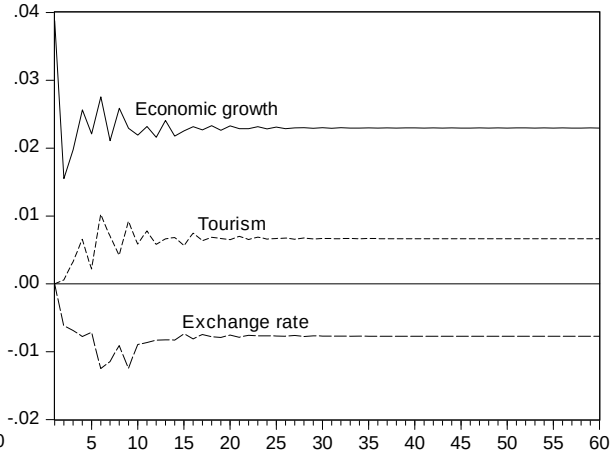
China



Germany



Indonesia



Japan

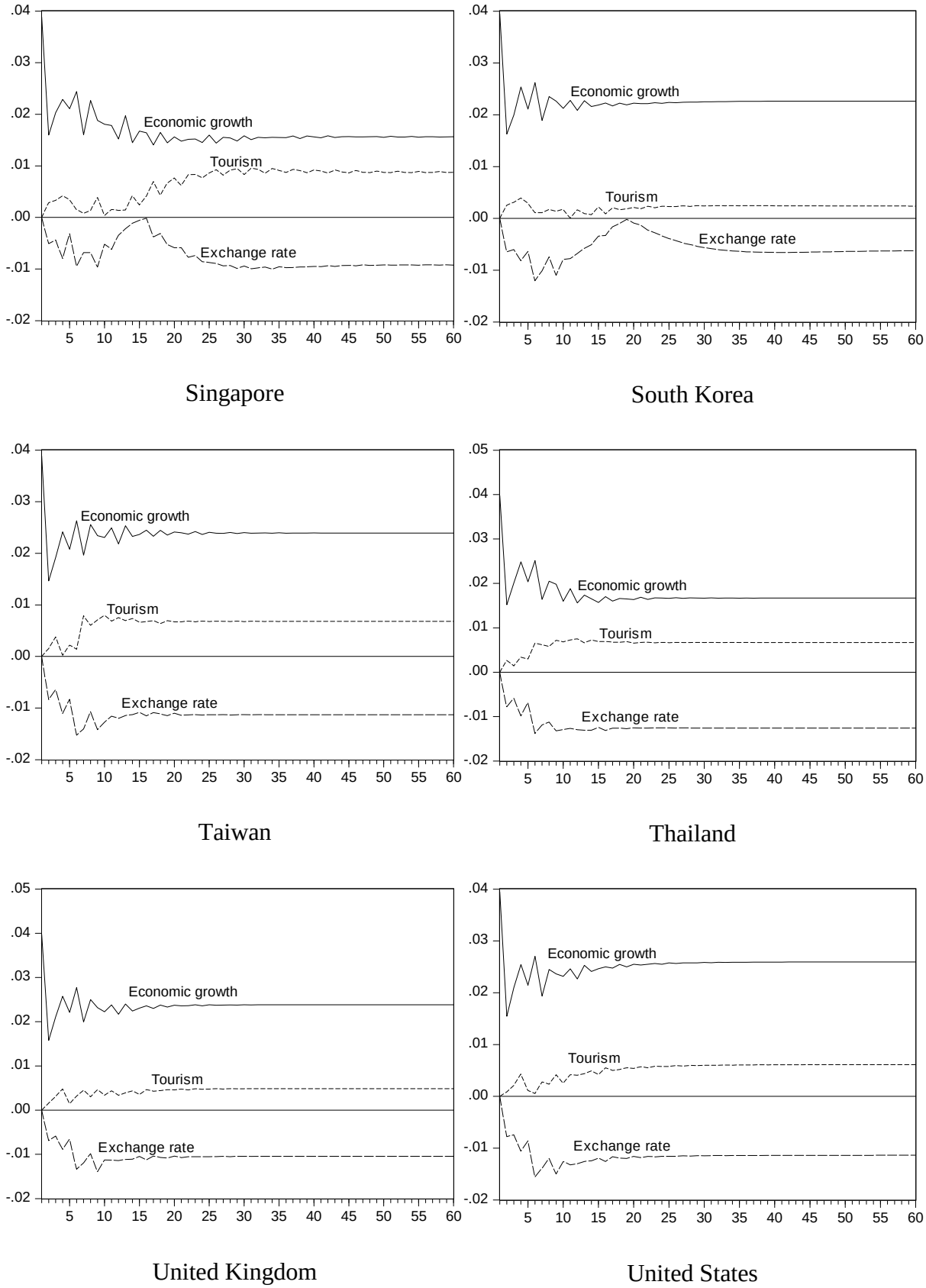


Figure 4.3: Impulse Responses of Economic Growth to One-Standard Deviation Shocks in Economic Growth, Tourism and Exchange Rate

4.4 Concluding Remarks

By employing the monthly data from January 1995 to December 2010, this study investigated the validity and the stability of the tourism-led growth hypothesis in Malaysia with reference to tourist arrivals from 12 major tourism markets. The newly developed combined cointegration test reveals that Malaysia's economic growth is cointegrated with tourist arrivals from these tourism markets. Contrary to conventional wisdom, the results of full sample Granger causality test showed that only 2 out of 12 tourism markets contributed to economic growth in the short-run whereas in the long-run, 10 out of 12 tourism markets supported the tourism-led growth hypothesis.

In terms of stability, the results of the recursive Granger causality test demonstrate that only 10 out of the 12 tourism markets provide stable support for the tourism-led growth hypothesis in Malaysia, and most of them are developed economies. Hence, not all tourist arrivals could significantly contribute to Malaysia's economic growth. To optimise resource utilisation, it is suggested that tourism marketing policies should target those tourism markets that could consistently contribute to economic growth. By doing so, there could be a better chance of fulfilling one of the objectives of the Tenth Malaysia Plan 2011-2015 i.e. to enhance the role of tourism in economic growth.

CHAPTER 5:

MODELLING THE DEMAND FOR INBOUND TOURISM IN MALAYSIA [17]

5.1 Introduction

Thus far the previous chapters have shown that tourism is a potential stimulus of growth. Given its importance as a catalyst of growth, it is imperative to investigate the factors that influence demand for tourism. This is because such analysis can afford policymakers invaluable insights that could facilitate the design of tourism focused policies attuned to market demands (Song, Witt and Li, 2009). Moreover, informed policy formulation can also enhance the optimisation of available resources. The need for tourism demand modelling has heralded the generation of numerous studies dedicated to the topic (Crouch, 1994a, 1994b; Johnson and Ashworth, 1990; Lim, 1997). However, these early studies have largely concentrated on examining tourism demand in the West. Consequently, studies on tourism demand in developing countries such as Malaysia have engendered minimal attention.

Malaysia is a popular tourism destination in Asia. In 2005, Malaysia was ranked the second most visited destination in Asia (Zain, 2005). Tourism has also been the second largest foreign exchange earner for Malaysia since 2000. As such, Malaysia constitutes an important case study in the area of inbound tourism demand. Thus far, several studies have investigated inbound tourism demand in Malaysia (e.g. Hanafiah and Harun, 2010; Salleh et al., 2010; Kadir and Karim, 2009; Habibi et al., 2009; Salleh et al., 2008; Kadir, Abdullah and Nayan, 2008; Salleh, Othman and Ramachandran, 2007).

[17] The idea of this analytical chapter has been presented in two international conferences, namely USM-AUT International Conference 2012: *Sustainable Economic Development, Policies and Strategies* and the 5th International Conference on Humanities and Social Sciences 2013: *Intercultural Transition into ASEAN Community*.

However, none of these studies have considered the impact of crime and environmental pollution on tourism demand in the country. Tang (2009) observed that, crime rates in Malaysia have increased significantly from approximately 30 thousand criminal cases in 1970 to approximately 200 thousand criminal cases in 2006. As crime is generally perceived to be a source of individual and community insecurity in every society, its prevalence in Malaysia implies a poor level of public order and security (Tang, 2010a). This notion of insecurity is further aggravated by the constant presentation of crime in the media that contributes towards an escalation in feelings of fear and personal insecurity (Garofalo (1979) thus negatively impacting demand for tourism. This is because potential tourists would be deterred by the lack of public security to visit a crime prone tourism destination. Sönmez and Graefe (1998) and Brunt, Mawby and Hambly (2000) also revealed that tourists are more likely to choose a less risky destination to travel to because the personal security is a pre-requisite determinant in the selection of a destination. Pizam (1999) stressed that when security is an issue, tourists are willing to cancel or postpone travel to a particular destination or choose alternative tourism destination that poses less security risks (see also Ryan, 1993).

Gartner (1996) and Massidda and Etzo (2012) noted that another important element in the choice of a tourism destination is the quality of its environment. Similarly, Bigano, Hamilton and Tol (2006), Hamilton and Lau (2005) and Maddison (2001) observed that the environment was one of the main factors that affects tourists' decision-making when selecting their travel destination. Smith (1993) mentioned that weather such as rain, strong winds, severe thunderstorms, floods and severe air temperature will influence tourists' comfort, health and safety (see also Greenough et al., 2001).

A review of previous studies pertaining to tourism demand indicates that earlier studies on Malaysia have often tended to overlook the role of crime and environmental quality when modelling tourism demand. This study purports to address these lacks by analysing the role of crime and environmental quality in shaping the behavioural patterns of inbound tourists to Malaysia. More precisely, this study seeks to better determine inbound tourism demand by incorporating environmental pollution and crime rate as new explanatory variables into the model. In doing so, the estimation model of this study will not only allow for the examination of the effects of economic variables but also the effects of environmental and social variables on the demand for tourism in Malaysia. In addition, this study aspires to contribute towards the attainment of objectives enshrined in the National Tourism Policy in promoting Malaysia as a leading tourism destination (Othman, 2007). Based on the findings of this study, more effective and comprehensive policies can be designed to attract more genuine tourists to Malaysia that will eventually accelerate economic growth and development.

Secondly, past Malaysian studies on tourism demand have often used time series data. However, the accuracy of such studies are questionable as standard time series unit root and cointegration tests are likely to be low powered and distorted, especially when the data span is short. To circumvent this problem, this study proposes to investigate the behaviour of inbound tourism demand in Malaysia through the application of non-stationary panel data approaches. Specifically, this study will employ panel unit root tests proposed by Im, Pesaran and Shin (2003) and Maddala and Wu (1999) as well as the panel cointegration tests developed by Pedroni (1999, 2004). One of the advantages of using the panel data approach is that it can improve the power of unit root and cointegration tests by accommodating the cross-sectional into the time series dimension

to form panel datasets. Therefore, estimation results of this study would be more reliable and efficient owing to the tremendous increase in the degree of freedom.

The remainder of this chapter is structured as follows. Section 5.2 will provide a discussion of the empirical model and the source of data. The econometric techniques used in this study will be discussed in Section 5.3 while. Section 5.4 will discuss the results of this study. Finally, the concluding remarks will appear in Section 5.5.

5.2 Empirical Model and Data Source

In this section, the empirical model and data used will be outlined.

5.2.1 Empirical Model

Modelling the demand for tourism is definitely not an easy task, but it has significant contribution to policymakers in their formulation of appropriate tourism policies. A review of existing literature shows that, empirical models for tourism demand vary among researchers. In line with the theory of consumer behaviour and existing tourism demand literature, the following inbound tourism demand model for the Malaysian economy is suggested:

$$VA_{MAL,jt} = f\left(GDP_{jt}, P_{MAL,jt}, P_{SUB,t}, POL_{MAL,t}, CR_{MAL,t}, DUM_{ij}\right) \tag{5.1}$$

where $VA_{MAL,jt}$ is the per capita tourist arrivals from origin country *j* to Malaysia. In this study, the origin country *j* represents the 12 major tourism markets, namely, Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea, Taiwan, Thailand,

the United Kingdom, and the United States. GDP_{jt} refers to the per capita real gross domestic product (GDP) for origin country *j*. $P_{MAL,jt}$ is the price of tourism in Malaysia adjusted by the exchange rate. The price of tourism plays a very important role in the determination of either visiting Malaysia or staying at home. According to Lim (1997), $P_{MAL,jt}$ is calculated by dividing the CPI in Malaysia with the CPI in the origin country *j* and then multiplying the ratio with the nominal exchange rate. Based on this modality, it can be inferred that, the price of tourism in Malaysia is a combination of relative prices and the exchange rate. It should be noted that the price of tourism in Malaysia reflects the cost of tourism activities in Malaysia relative to the cost of tourism activities in the origin country *j*. Thus, following Song, Wong and Chon (2003) and Song et al. (2010), the price of tourism in Malaysia can be defined as:

$$P_{MAL,jt} = \frac{CPI_{Mal} / ER_{Mal}}{CPI_{jt} / ER_{jt}} \tag{5.2}$$

where CPI_{Mal} and CPI_{jt} are the consumer price indices (CPIs) for Malaysia and origin country *j*, respectively. ER_{Mal} refers to the exchange rate between Ringgit Malaysia and the US dollar, whereas ER_{jt} is the nominal exchange rate between currency of the origin country *j* and the US dollar.

The theory of consumer behaviour and previous studies (e.g. Seetanah, Durbarry and Ragodoo, 2010; Song, Wong and Chon, 2003; Song, Witt and Jensen, 2003) stipulate that the choice of tourism destination not only depend on the price of the destination (i.e. own price of tourism) while the price of alternative destinations may also have an important bearing in determining the choice of the ultimate tourism destination.

Therefore, apart from the own price of tourism in Malaysia, this study also includes the substitute prices of tourism in the proposed tourism demand model. Considering the geographical and cultural characteristics of countries in the region, this study selects Indonesia, Singapore, Thailand and the Philippines as the potential alternative tourism destinations to Malaysia. In equation (5.1), the substitute price of tourism $\left(P_{SUB,t}\right)$ is the weighted average price of tourism in alternative destinations. The impact of the substitute price of tourism can either be positive or negative. A positive impact implies that as the price of tourism in alternative destination increases, the demand for tourism in Malaysia increases. This is because tourists are more likely to substitute high-cost tourism destinations with lower cost tourism destinations. A positive $P_{SUB,t}$ indicates that Indonesia, Singapore, Thailand and the Philippines are substitute tourism destinations to Malaysia. On the other hand, a negative $P_{SUB,t}$ shows that Indonesia, Singapore, Thailand and the Philippines are complementary tourism destinations to Malaysia. Following Gallet and Braun (2001) and Song, Wong and Chon (2003), the weighted average substitute price of tourism is calculated using the following equation:

$$P_{SUB,t} = \sum_{k=1}^{4} \frac{CPI_{kt}}{ER_{kt}} w_{kt} \tag{5.3}$$

where k = 1, 2, 3 and 4 refer to the 4 alternative tourism destinations, respectively. w_{kt} is the share of international tourist arrivals to country k and can be calculated from $w_{kt} = VA_{kt} \Big/ \sum_{k=1}^{4} VA_{kt}$, where VA_{kt} is the total international tourist arrivals in country k.

Apart from the economic variables such as income and prices of tourism, environmental pollution could also affect a tourist's satisfaction and the choice of where and when to go (Bigano, Hamilton and Tol, 2006; Hamilton and Lau, 2005; Maddison, 2001). In light of this, it is also rational to surmise that countries with high level of pollution are less likely to be visited because it will not only affect tourists' satisfaction, but also affect their health. In the aforementioned model, $POL_{MAL,t}$ is the level of air pollution in Malaysia and is defined as per capita carbon dioxide (CO_2) emissions.

Besides pollution, the prevalence of crime in the tourism destination would also deter international tourist arrivals. In fact, the findings of Sönmez and Graefe (1998), Pizam (1999), and Brunt, Mawby and Hambly (2000) emphasised that tourists are more likely to choose less risky destinations for travel because safety and security are important determinants in choosing a tourism destination. Garofalo (1979) added that fear is not merely generated from the experience of crime, but also by the media representations of crime. Therefore, an increase in the crime rate will reduce the demand for tourism because most tourists fear crime. In the aforementioned model, $CR_{MAL,t}$ refers to the crime rate (i.e. number of crimes per 100,000 residents in Malaysia) and is used to measure the level of safety and security in Malaysia.

As the qualitative effects on tourism demand are difficult to quantify, a set of one-off dummies $DUM_{i,t}$ is used to capture the qualitative effects on tourism demand in Malaysia. The aforementioned dummy variable refers to one-off events such as the *Malaysia Truly Asia* global tourism campaign from 1999 to 2010; the SARS and avian flu epidemics in 2003, and the terrorist attacks at the World Trade Centre in New York and the Pentagon in the United States in September 2001.

Based on the foregoing, the econometric model for tourism demand in Malaysia can be written as follows:

$$\ln VA_{MAL,jt} = \beta_0 + \beta_1 \ln GDP_{jt} + \beta_2 \ln P_{MAL,jt} + \beta_3 \ln P_{SUB,t} + \beta_4 \ln POL_{MAL,t}$$
$$+ \beta_5 \ln CR_{MAL,t} + \beta_6 DMTA_{i,t} + \beta_7 D911_{i,t} + \beta_8 SARS_{i,t} + \varepsilon_{i,t} \quad (5.4)$$

where ln denotes the natural logarithm and $\varepsilon_{i,t}$ is the residual of the panel regression. β_1, β_2, β_3, β_4 and β_5 are the elasticities for income, own-price, substitution price, environmental pollution and crime rate, respectively. $DMTA_{i,t}$ is a dummy variable to cater for the effect of the *Malaysia Truly Asia* global tourism campaign that takes the value of 1 for the period 1999 to 2010 and 0 otherwise. $D911_{i,t}$ is a dummy variable that takes the value of 1 in 2001 and 0 otherwise. Finally, $SARS_{i,t}$ is a dummy variable that takes the value of 1 in 2003 and 0 otherwise.

5.2.2 Sources of Data

This study attempts to examine inbound tourism demand in Malaysia using balance panel data for 12 major tourism markets from 1989 to 2010. The major tourism markets are Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea, Taiwan, Thailand, the United Kingdom (UK) and the United States (USA). The data used in this study were extracted from the *Royal Malaysian Police* (RMP), *World Development Indicators* (WDI), *International Financial Statistics* (IFS) and CEIC databases. All variables were transformed into natural logarithm form, except for the dummy variables.

5.3 Methodology

This section will elaborate on the methodology utilised in collating the results.

5.3.1 Panel Unit Root Tests

Unit root tests have been extensively explored in time series literature due to the spurious regression problem. Hence, testing for unit root in panel data analysis is necessary to avoid spurious regression problems. Moreover, testing for the unit root is also a pre-requisite requirement in determining for the presence of cointegration relationship between variables of interest. In this study, the heterogeneous panel unit root test developed by Im, Pesaran and Shin (IPS, 2003) will be used. Im, Pesaran and Shin (2003) adopt the Augmented Dickey-Fuller (ADF) framework to construct a unit root test for panel data that allows for heterogeneity. Hence, the IPS unit root test is a null non-stationarity test. To implement the IPS unit root test, the following equation will be estimated:

$$\Delta w_{i,t} = a_{i1} + a_{i2}t + b_i w_{i,t-1} + \sum_{i=1}^{p_i} c_{ij} \Delta w_{i,t-j} + e_{i,t} \tag{5.5}$$

where $i = 1,\ldots,N$ and $t = 1,\ldots,T$. Δ is the first difference operator, $\left(w_{i,t} - w_{i,t-1}\right)$, and the residuals $\left(e_{i,t}\right)$ are assumed to be independent across countries.

The IPS unit root test is a two-stage approach. In the first stage, the mean value of the individual ADF-statistic for each of the countries under investigation is calculated while in the second stage, the following equation is used to construct the standardised IPS t-statistic for unit root test.

$$t_{IPS} = \frac{\sqrt{N}\left[\bar{t} - E\left(\bar{t}\right)\right]}{\sqrt{\text{var}\left(\bar{t}\right)}} \tag{5.6}$$

Here $\bar{t}$ is the mean value of the calculated individual ADF-statistic, while $E\left(\bar{t}\right)$ and $\text{var}\left(\bar{t}\right)$ represent the theoretical mean value and variance of $\bar{t}$.

To check for robustness, the panel unit root test proposed by Maddala and Wu (MW, 1999) will be applied. This is a non-parametric test and has a chi-square distribution with *2N* degrees of freedom, where *N* is the number of cross-sectional units. Maddala and Wu (1999) proposed the Fisher-type panel unit root test by combining the *p*-values of individual ADF-statistic for each of the countries under investigation using the following equation:

$$MW = -2\sum_{i=1}^{N} \ln p_i \tag{5.7}$$

where ln denotes the natural logarithm and p_i are the probability values of the computed individual ADF-statistics.

5.3.2 Pedroni Cointegration Tests

Testing for cointegration is pivotal for time series as well as for panel data analyses because it has a direct implication to the problem of spurious regression, particularly when the variables are non-stationary. This is because if the variables are non-stationary and/or non-cointegrated, regression results with such variables are likely to be biased. Therefore, the panel cointegration approach proposed by Pedroni (1999, 2004) will be used to verify the existence of cointegration between tourism and its determinants in Malaysia. With regard to this, the following panel regression model will be estimated:

$$y_{i,t} = \alpha_i + \delta_i t + \sum_{m=1}^{M} \beta_{mi} x_{mi,t} + \varepsilon_{i,t} \tag{5.8}$$

where $y_{i,t}$ is the dependent variable (i.e. tourist arrivals) with the dimension of $NT \times 1$, while $x_{i,t}$ are the explanatory variables with the dimension of $NT \times m$ where N is the cross-sections, T denotes the time period while m refers to the number of explanatory variables. Both $y_{i,t}$ and $x_{i,t}$ are assumed to follow the $I(1)$ process. Unlike other panel cointegration tests (e.g. Kao, 1999) that imposed homogeneity assumption in the slope coefficients, Pedroni (1999, 2004) noted that the intercept (α_i) and the slope coefficients (β_{mi}) are permitted to vary across the individual members in the panel. For this reason, it is also known as the Pedroni's heterogeneous panel cointegration test. $\varepsilon_{i,t} = y_{i,t} - \hat{\alpha}_i - \hat{\delta}_i t - \sum_{m=1}^{M} \hat{\beta}_{mi} x_{i,t}$ are residuals from the panel regression model.

To test for cointegration, Pedroni (1999, 2004) suggested seven residual-based tests to examine the null hypothesis of no cointegration in a panel data model that allowed for considerable heterogeneity. Specifically, the suggested tests can be classified into two categories. The first category consists four tests (i.e. panel ν-statistic, panel ρ-statistic, panel PP-statistic and panel ADF-statistic) based upon the 'within-dimension' procedure, whereby they are calculated by pooling the autoregressive coefficients across different members of panel for the unit root test on the residuals. In contrast, the second category consists three tests (i.e. group ρ-statistic, group PP-statistic and group ADF-statistic) based upon the 'between-dimension' procedure, whereby they constitute the simple averaging of the test statistics for cointegration in a time series across cross-sections. The seven tests statistics of Pedroni's heterogeneous panel cointegration test are listed below:

Panel ν-statistic: $$Z_{\hat{\nu}} = T^2 N^{3/2} \left(\sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^2 \right)^{-1} \tag{5.9}$$

Panel ρ-statistic: $$Z_{\hat{\rho}} = T\sqrt{N} \left(\sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^2 \right)^{-1} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \left(\hat{\varepsilon}_{i,t-1} \Delta \hat{\varepsilon}_{i,t} - \hat{\lambda}_i \right) \tag{5.10}$$

Panel PP-statistic: $$Z_t = \left(\tilde{\sigma}_{N,T}^2 \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^2 \right)^{-1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \left(\hat{\varepsilon}_{i,t-1} \Delta \hat{\varepsilon}_{i,t} - \hat{\lambda}_i \right) \tag{5.11}$$

Panel ADF-statistic: $$Z_t^* = \left(\tilde{s}_{N,T}^{*2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^{*2} \right)^{-1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^* \Delta \hat{\varepsilon}_{i,t}^* \tag{5.12}$$

Group ρ-statistic: $$\tilde{Z}_{\hat{\rho}} = TN^{-1/2} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} \hat{\varepsilon}_{i,t-1}^2 \right)^{-1} \sum_{t=1}^{T} \left(\hat{\varepsilon}_{i,t-1} \Delta \hat{\varepsilon}_{i,t} - \hat{\lambda}_i \right) \tag{5.13}$$

Group PP-statistic: $$\tilde{Z}_t = N^{-1/2}\sum_{i=1}^{N}\left(\hat{\sigma}_i^2\sum_{t=1}^{T}\hat{\varepsilon}_{i,t-1}^2\right)^{-1/2}\sum_{t=1}^{T}\left(\hat{\varepsilon}_{i,t-1}\Delta\hat{\varepsilon}_{i,t}-\hat{\lambda}_i\right) \quad (5.14)$$

Group ADF-statistic: $$\tilde{Z}_t^* = N^{-1/2}\sum_{i=1}^{N}\left(\sum_{t=1}^{T}\hat{s}_i^{*2}\hat{\varepsilon}_{i,t-1}^{*2}\right)^{-1/2}\sum_{t=1}^{T}\left(\hat{\varepsilon}_{i,t-1}^{*}\Delta\hat{\varepsilon}_{i,t}^{*}\right) \quad (5.15)$$

where:

$$\hat{\lambda}_i = \frac{1}{T}\sum_{s=1}^{k_i}\left(1-\frac{s}{k_i+1}\right)\sum_{t=s+1}^{T}\hat{\mu}_{i,t}\hat{\mu}_{i,t-s}\,,\quad \hat{s}_i^2 = \frac{1}{T}\sum_{t=1}^{T}\hat{\mu}_{i,t}^2\,,\quad \hat{\sigma}_i^2 = \hat{s}_i^2 + 2\hat{\lambda}_i\,,\quad \tilde{\sigma}_{N,T}^2 = \frac{1}{N}\sum_{i=1}^{N}\hat{L}_{11i}^{-2}\hat{\sigma}_i^2\,,$$

$$\hat{s}_i^{*2} = \frac{1}{T}\sum_{t=1}^{T}\hat{\mu}_{i,t}^{*2}\,,\quad \tilde{s}_{N,T}^{*2} = \frac{1}{N}\sum_{i=1}^{N}\hat{s}_i^{*2}\,,\quad \text{and}\quad \hat{L}_{11i}^2 = \frac{1}{T}\sum_{t=1}^{T}\hat{\eta}_{i,t}^2 + \frac{2}{T}\sum_{s=1}^{k_i}\left(1-\frac{s}{k_i+1}\right)\sum_{t=s+1}^{T}\hat{\eta}_{i,t}\hat{\eta}_{i,t-s}\,.$$

Furthermore, $\hat{\mu}_{i,t}$, $\hat{\mu}_{i,t}^*$ and $\hat{\eta}_{i,t}$ are calculated from $\hat{\varepsilon}_{i,t} = \hat{\gamma}_i\varepsilon_{i,t-1} + \hat{\mu}_{i,t}$, $\hat{\varepsilon}_{i,t} = \hat{\gamma}_i\hat{\varepsilon}_{i,t-1} + \sum_{k=1}^{K_i}\hat{\gamma}_{i,k}\Delta\hat{\varepsilon}_{i,t-k} + \hat{\mu}_{i,t}^*$ and $\Delta y_{i,t} = \sum_{m=1}^{M}\hat{b}_{mi}\Delta x_{mi,t} + \hat{\eta}_{i,t}$, respectively. $\hat{L}_{11i}^2$ denotes the long-run conditional asymptotic covariance matrix for the residuals $\left(\Delta\hat{\varepsilon}_{i,t}\right)$ while $\hat{\sigma}_i^2$ and $\hat{s}_i^2$ are the individual long-run and contemporaneous variances of the residuals $\left(\hat{\varepsilon}_{it}\right)$, respectively. Additionally, Pedroni (1999) noted that under appropriate mean and variance corrections, the standardised panel and group mean statistics for cointegration become asymptotically normally distributed.

5.3.3 Group Mean Fully Modified OLS (FMOLS) Estimator

After determining the existence of cointegration, the group mean Fully Modified Ordinary Least Squares (FMOLS) estimator suggested by Pedroni (2000) will be employed to estimate the relationship between tourism and its determinants in Malaysia. On the basis of the Monte Carlo experiment, Chen, McCoskey and Kao (1999)

discovered that estimated results based upon the FMOLS estimator are more robust in cointegrated panel regressions. In addition, Pedroni (2000) observed that the FMOLS estimator constructed by incorporating the Phillips and Hansen's (1990) semi-parametric correction to the OLS estimator not only adjusted the heterogeneity that appeared in the fixed effect and in the short-run dynamic, but also removed the endogeneity and serial correlation problems. The group mean FMOLS estimator is expressed below:

$$\hat{\beta}^{*}_{FMOLS} = \frac{1}{N}\sum_{i=1}^{N}\left[\frac{\sum_{t=1}^{T}\left(x_{i,t}-\overline{x}_i\right)y^{*}_{i,t} - T\hat{\gamma}_i}{\sum_{t=1}^{T}\left(x_{i,t}-\overline{x}_i\right)^2}\right] \tag{5.16}$$

where $y^{*}_{i,t} = \left(y_{i,t}-\overline{y}_i\right) - \frac{\hat{\Omega}_{21i}}{\hat{\Omega}_{22i}}\Delta x_{i,t}$ and $\hat{\gamma}_i = \hat{\Gamma}_{21i} + \hat{\Omega}^{0}_{21i} - \frac{\hat{\Omega}_{21i}}{\hat{\Omega}_{22i}}\left(\hat{\Gamma}_{22i} + \hat{\Omega}^{0}_{22i}\right)$. Pedroni (2000; 2001) noticed that the asymptotic covariance matrix, Ω_i differed across individual members and that it can also be decomposed as $\Omega_i = \Omega^{0}_{i} + \Gamma_i + \Gamma'_i$ where Ω^{0}_{i} is the contemporaneous covariance matrix and Γ_i is the weighted sum of autocovariances. The asymptotic long-run covariance matrix can be estimated by using the Newey-West estimator. Apart from that, the group mean t-statistics associated with the group mean FMOLS can be calculated via the following equation:

$$\overline{t}_{\hat{\beta}^{*}_{FMOLS}} = \frac{1}{\sqrt{N}}\sum_{i=1}^{N}\left(\hat{\beta}^{*}_{FMOLS}-\beta\right)\left(\hat{\Omega}^{-1}_{11i}\sum_{t=1}^{T}\left(x_{i,t}-\overline{x}_i\right)^2\right)^{1/2} \tag{5.17}$$

5.4 Empirical Results

The results of the data analysis are presented in this section

5.4.1 Panel Unit Root and Cointegration Results

In this section, the empirical results of this study are discussed. Prior to testing for the presence of cointegration using the residual-based panel cointegration tests as developed by Pedroni (1999, 2004), it is necessary to verify the order of integration of each series. For this purpose, this study employed the t-bar test of IPS and the Fisher-ADF test of MW for unit root in the panel data. The results of IPS panel unit root tests are reported in Table 5.1.

Table 5.1: The Results of Panel Unit Root Tests

Variables	IPS t-bar statistics	MW-Fisher ADF statistics
$\ln VA_{MAL,\,jt}$	–1.753	15.541
$\Delta \ln VA_{MAL,\,jt}$	–2.894***	42.997***
$\ln GDP_{jt}$	–2.045	24.669
$\Delta \ln GDP_{jt}$	–3.512***	67.193***
$\ln P_{MAL,t}$	–2.315	28.009
$\Delta \ln P_{MAL,t}$	–4.309***	101.245***
$\ln P_{SUB,t}$	–1.177	2.872
$\Delta \ln P_{SUB,t}$	–3.711***	74.472***
$\ln POL_{MAL,t}$	–1.992	13.488
$\Delta \ln POL_{MAL,t}$	–3.004***	44.510***
$\ln CR_{MAL,t}$	–1.427	4.880
$\Delta \ln CR_{MAL,t}$	–2.884***	39.747**

Note: The asterisks *** and ** denote the significance at the 1 and 5 per cent levels, respectively. The unit root tests are conducted with intercept and trend and the selection of deterministic components is based upon the plot of each series. The critical for IPS t-bar statistics are collected from Im, Pesaran and Shin (2003).

At level, this study observed that the t-bar statistics of the IPS panel unit root test do not reject the null hypothesis of a unit root for all variables at the 5 per cent significance level. Based on the results of the IPS panel unit root test, all variables are non-stationary at level. Nevertheless, at first differences the t-bar statistics of IPS panel unit root tests consistently reject the null hypothesis of a unit root for all variables at the 1 per cent significance level. Therefore, it can be concluded that the variables are integrated of order one, $I(1)$ process.

Apart from that, the Fisher-ADF panel unit root test proposed by Maddala and Wu (1999) was performed to confirm the order of integration of each series. Similar to the results of the aforementioned IPS panel unit root test, it was detected that the Fisher-ADF statistics also failed to reject the null hypothesis of a unit root for all variables at the 5 per cent significance level (see Table 5.1). However, at first differences, it was noted that the Fisher-ADF statistics rejected the null hypothesis of a unit root for all variables at the 5 per cent significance level or better. Therefore, it can be concluded that $\ln VA_{MAL,jt}$, $\ln GDP_{jt}$, $\ln P_{MAL,jt}$, $\ln P_{SUB,t}$, $\ln POL_{MAL,t}$ and $\ln CR_{MAL,t}$ belonged to $I(1)$ process. In general, these results are consistent with that of Nelson and Plosser (1982) who noted that macroeconomic variables are likely to be non-stationary at level, and become stationary after first differencing.

Having established that all the selected variables follow the $I(1)$ process, the next step of this study was to examine the existence of a long-run equilibrium relationship between tourist arrivals and its determinants in Malaysia using Pedroni's panel cointegration tests. The panel cointegration results are presented in Table 5.2. Overall, there are seven types of residual-based tests for cointegration and the results tended to be inconsistent. From the panel cointegration results illustrated in Table 5.2, the majority of the tests'

statistics (i.e. 4 out of 7 tests) were observed to have rejected the null hypothesis of no cointegration between tourist arrivals and its determinants in Malaysia at the 1 per cent significance level. However, only 3 tests' statistics did not reject the null hypothesis of no cointegration at the conventional significance levels. Specifically, panel v-statistic, panel ρ-statistic and group ρ-statistic could not reject the null hypothesis even at the 5 per cent significance level.

Table 5.2: The Results of Pedroni Cointegration Tests

Panel cointegration test	Statistics
Panel v-stat	–1.369
Panel ρ-stat	2.266
Panel PP-stat	–3.202***
Panel ADF-stat	–4.889***
Group ρ-stat	3.587
Group PP	–2.707***
Group ADF	–4.789***
Conclusion	Cointegrated

Note: The asterisks *** and ** denote the significance at the 1 and 5 per cent levels, respectively. RATS programming code is used to compute the Pedroni cointegration tests. The null hypothesis of no cointegration can be rejected if: (a) the panel v-statistic is greater than 2.326 (1 per cent) or 1.645 (5 per cent); (b) the other six tests statistics are less than –2.326 (1 per cent) or –1.645 (5 per cent).

On the other hand, the panel PP-statistic, panel ADF-statistic, group PP-statistic and group ADF-statistic successfully rejected the null hypothesis of no cointegration at the 1 per cent significance level. Obviously, the results of the cointegration tests are conflicting and vary among the panel cointegration tests of Pedroni (1999). According to Pedroni (2004), group ADF-statistic and panel ADF-statistic are superior to other tests for cointegration, particularly with small samples. Likewise, the Monte Carlo experiment conducted by Örsal (2008) also demonstrated that the panel ADF-statistic for cointegration had the best size and power properties (see also Harris and Sollis,

2003). For these reasons, the cointegration results provided by group ADF-statistics and panel ADF-statistics were preferred. Since these two tests' statistics rejected the null of no cointegration, it can be implied that the variables under investigation are cointegrated. Hence, there is a meaningful long-run relationship between tourism and its determinants in Malaysia. The finding of the presence of cointegration between tourism and its determinants is consistent with previous studies (e.g. Narayan, 2004; Choyakh, 2008; Seetanah, Durbarry and Ragodoo, 2010).

5.4.2 Group Mean FMOLS Results

Since the variables were observed to be cointegrated, the long-run relationship between tourism and its determinants in Malaysia was estimated using the group mean FMOLS estimator. Table 5.3 shows the estimation results of long-run coefficients and the t-statistics for each of the explanatory variables. Overall, the panel estimation results in Table 5.3 reveal that all explanatory variables were statistically significant at the 5 per cent level or better. Moreover, the coefficients' signs were also consistent with both economic theory and our expectations.[18]

The per capita GDP was observed to have an elastic positive effect on tourism demand in Malaysia. The coefficient of $\ln GDP_{jt}$ indicates that a 1 per cent increase in per capita income, would cause a 1.99 per cent increase in average tourist arrivals from the 12 major tourism markets. This result shows that the demand for tourism in Malaysia is

[18] To the best of present knowledge, pooling the tourist-generating markets together may not reflect the true demand for inbound tourism in Malaysia, especially when the elasticities of the explanatory variables vary across the source markets. Therefore, it is rational to inquire whether this study should pool or not to pool the data as stipulated in Baltagi, Griffin and Xiong (2000). With regard to the issue of poolability, this study carries out the newly developed bootstrap range test for poolability introduced by Di Iorio and Fachin (2012). This poolability test is the choice in this study because it has good size and power properties even when the cross-sectional and time dimensions are relatively small as the case of the present study (i.e. $N = 12$ and $T = 22$). The results show that none of the bootstrap p-values are less than 0.05, implying the estimate demand elasticities are not significantly vary among tourist-generating markets. Therefore, it is confirms that the long-run demand elasticities estimated by the group mean FMOLS are correctly reflect the demand for inbound tourism in Malaysia. The full results for bootstrap range test for poolability are not reported here, but they are available in Table C.1 of Appendix C.

very sensitive to income levels. This is consistent with prevailing economic theory and also with findings of past studies (e.g. Choyakh, 2008; Kim and Song, 1998; Lee, 1996; Narayan, 2004; Ouerfelli, 2008; Salleh, et al., 2010; Tan, McCahon and Miller, 2002). In addition, the findings of this study also indicate that tourism was considered to be a luxury item as income elasticity is greater than unity.

Table 5.3: The Results of Group Mean FMOLS

Variables	Coefficients	t-statistics
$\ln GDP_{jt}$	1.991***	4.528
$\ln P_{MAL,t}$	–0.771***	–6.188
$\ln P_{SUB,t}$	–0.410***	–5.907
$\ln POL_{MAL,t}$	–0.243***	–3.270
$\ln CR_{MAL,t}$	–0.371***	–10.157
DMTA	0.229***	7.873
*D*911	–0.088**	–2.167
SARS	–0.278***	–10.929

Note: The asterisks *** and ** denotes the significance at the 1 and 5 per cent levels, respectively. The Group Mean FMOLS is calculated using a procedure written in RATS.

Apart from that, this study also noted that the price of tourism in Malaysia had a significant inelastic negative effect on tourism demand in the markets under review. This is consistent with the theory of consumer behaviour and that of earlier studies (e.g. Kadir, Abdullah and Nayan, 2008; Narayan, 2004; Salleh, et al., 2008; Seetanah, Durbarry and Ragodoo, 2010; Tan, McCahon and Miller, 2002; Witt and Martin, 1987). The coefficient of $\ln P_{MAL,t}$ reveals that by holding other factors constant, a 10 per cent increase in the price of tourism in Malaysia would result in a 7.7 per cent decline in tourist arrivals from these 12 major tourism markets. The alternative price of tourism $\left(\ln P_{SUB,t}\right)$ also had a significant inelastic negative effect on tourism demand in

Malaysia. This implies that Indonesia, Singapore, Thailand and the Philippines are more likely to be the complementary tourism destination rather than substitutes to Malaysia. This finding is in accord with those of Kadir and Karim (2009), Choyakh (2008) and Song, Witt and Jensen (2003). In other words, this study found that a 10 per cent increase in the substitute price of tourism reduced tourist arrivals by 4.1 per cent. Comparing the price effects on tourism demand, it was noted that a change in the price of tourism in Malaysia had a greater impact on tourism demand than the substitute price of tourism. Therefore, an increase in the price level in Malaysia would reduce tourist arrivals more than an increase in the price level of other countries in the region.

In terms of environmental pollution $\left(\ln POL_{MAL,t}\right)$, the estimation results show that the coefficient of $\ln POL_{MAL,t}$ was negative and statistically significant at the 1 per cent level. Therefore, it can be concluded that the choice of Malaysia as a tourism destination is very closely linked to the quality of environment prevailing in Malaysia. A 10 per cent increase in the environmental pollution would cause tourist arrivals from these 12 major tourism markets to fall by approximately 2.4 per cent. Likewise, the findings also suggest that the crime rate $\left(\ln CR_{MAL,t}\right)$ was statistically significant at the 1 per cent level although it had an inelastic negative effect on tourism demand in Malaysia. This signifies that international tourists would react negatively to an increase in the crime rate in Malaysia. For example, a 10 per cent increase in the crime rate would lead to a 3.7 per cent decrease in tourist arrivals to Malaysia. Hence, the results of this study indicate that international tourists to Malaysia were sensitive to the quality of environment and the crime rate in Malaysia. These findings are in accord with those of Massidda and Etzo (2012), Lise and Tol (2002), Pizam (1999) and Zhang (1998). In addition, Cothran and Cothran (1998) claimed that no matter how attractive a tourism destination is; tourists will cancel their travel trip if they feel their safety cannot be

guaranteed. In the case of the United Kingdom, Brunt, Mawby and Hambly (2000) found in a survey that 42 per cent of respondents had decided to cancel their travel trip due to the crime-related problem. Furthermore, Neumayer (2004) added that high crime rate may create a negative perception amongst visitors about the level of public security of a country. Thus, it is not surprise to find that demand for tourism react negatively to crime rate.

This study also finds that the terrorist attack in the United States in 2001 $\left(D911_{i,t}\right)$ and the SARS and avian flu epidemics in 2003 $\left(SARS_{i,t}\right)$ had a negative effect on the demand for tourism in Malaysia. Although the magnitudes varied among the two qualitative factors, the coefficients of $D911_{i,t}$ and $SARS_{i,t}$ were statistically significant at the 5 per cent level or better. Hence, these results indicate that international tourists are concerned about the level of security and health when choosing their destinations. On the other hand, it was noted that international tourist arrivals to Malaysia reacted positively to the *Malaysia Truly Asia* campaign as the coefficient was statistically significant at the 1 per cent level. This is because the campaign had effectively marketed Malaysia as an attractive tourism destination in Asia thus attracting significant numbers of inbound tourists.

5.5 Concluding Remarks

Using the panel unit root and cointegration approaches, this study analysed the behaviour of inbound tourism demand in Malaysia. Unlike earlier studies, this study contributed to the existing tourism demand literature by incorporating environmental pollution, and crime into the tourism demand model for Malaysia. The results reveal that tourism and its determinants in Malaysia were cointegrated.

The findings also show that income and the *Malaysia Truly Asia* campaign have positive relationships with tourism demand. Nevertheless, international tourist arrivals to Malaysia reacted negatively to the price of tourism, substitute price of tourism, environmental pollution and crime rate. This implies that the price of tourism, substitute price of tourism, environmental quality and security had significant impact on tourists' choice of destination. In other words, those destinations with high environmental pollution and/or high crime rate will be the least preferred destination while those destinations with a low cost (i.e. low inflation rate) of living would be able to attract genuine tourists, particularly from the 12 major tourism markets.

CHAPTER 6:

CONCLUSION

6.1 Summary of the Study

This study addressed the key research issues, i.e. the validity and the stability of the tourism-led growth hypothesis as well as the demand for inbound tourism in Malaysia using both time series and panel data approaches. This study commenced in Chapter 1 by providing an overview of the tourism sector before exploring the problem statement, the significance of this study and its research objectives. It then outlined the econometric strategies to be employed to resolve the problem statement. The unit root, cointegration and the Granger causality tests were the main econometric techniques adopted for use in this study. Next, a comprehensive literature review and theoretical frameworks pertaining to the tourism-led growth hypothesis and the demand for inbound tourism was outlined in Chapter 2. Subsequently, the next 3 analytical chapters pertained to the tourism-led growth hypothesis and the demand for inbound tourism in Malaysia. Chapter 3 analysed the Granger causality and the dynamic relationship between real income, real tourism receipts and real exchange rate in Malaysia using time series data. Chapter 4 investigated the validity as well as the stability of the tourism-led growth hypothesis in Malaysia with respect to international tourist arrivals from 12 major tourism markets, namely, Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea, Taiwan, Thailand, the United Kingdom (UK) and the United States (US). Chapter 5 analysed the demand for inbound tourism in Malaysia using a balance panel data of 12 major tourism markets.

The first objective of this study centred on investigating the assumption that high rates of tourist arrivals may not necessarily equate high rates of tourism earnings because not all arrivals were genuine tourists. In light of this, Chapter 3 investigated the tourism-led growth hypothesis in Malaysia at the aggregate level using annual data of real tourism receipts as a proxy for tourism. For robustness, the dynamic inter-relationship between economic growth, real tourism receipts and real exchange rate in Malaysia was also scrutinised using the impulse response function and variance decomposition analyses. The newly developed combined cointegration tests revealed that economic growth, real tourism receipts and real exchange rate in Malaysia are moving together over the long-run (i.e. cointegrated). With regard to the cointegrating vectors, it was observed that real tourism receipt had a significant positive impact on economic growth in Malaysia while the real exchange rate had a significant negative impact on economic growth. From the perspective of dynamic relationships, the results from the impulse response function analysis revealed that a shock to real tourism receipts had a positive effect on economic growth, implying that tourism could serve as an effective stimulus to Malaysia's economic growth. In terms of Granger causality, it was observed that real tourism receipts Granger-cause economic growth in both the short- and long-run. To recapitulate, the findings at the aggregate level confirm that the tourism-led growth hypothesis in Malaysia is valid.

Chapter 4 investigated the tourism-led growth hypothesis in Malaysia at the disaggregated level to avoid aggregation bias. In this chapter, international tourist arrivals were disaggregated into 12 major tourism markets, namely, Australia, Brunei, China, Germany, Indonesia, Japan, Singapore, South Korea, Taiwan, Thailand, the United Kingdom and the United States. Unlike earlier studies on the tourism-led growth hypothesis, the validity and the stability of the tourism-led growth hypothesis in

Malaysia were also examined with respect to 12 different tourism markets. Using the newly developed combined cointegration test, it was found that Malaysia's economic growth was cointegrated with tourist arrivals from these tourism markets. Contrary to conventional wisdom, only 10 (excepting Indonesia and China) out of the 12 tourism markets examined contributed to Malaysia's economic growth in the long-run. In contrast, only 2 (i.e. Germany and Thailand) out of the 12 tourism markets analysed contributed to Malaysia's economic growth in the short-run. In addition, the results of the recursive Granger causality test also exhibited that only 10 out of the 12 tourism markets could provide stable support for the tourism-led growth hypothesis in Malaysia with the majority of them being from developed economies. In summary, it can be surmised that the tourism-led growth hypothesis is valid but not all arrivals significantly contributed to Malaysia's economic growth.

As the findings in Chapter 3 and Chapter 4 consistently affirmed that the tourism-led growth hypothesis is valid, it can be deduced that tourism is a potential catalyst of growth in Malaysia. Therefore, understanding the factors influencing the demand for tourism becomes important. Chapter 5 tackled the issue by estimating the demand model for inbound tourism in Malaysia using the non-stationary panel data approach. In this study, the demand model not only examined the economic factors (i.e. income and prices of tourism) but also the impact of environmental pollution and crime rate on tourism demand. The results of the Pedroni cointegration test in Chapter 5 show that tourism and its determinants in Malaysia were cointegrated. Next, this study used the group mean FMOLS estimator to estimate the relationship between tourist arrivals and its determinants. It was observed that income was positively related to the demand for tourism and this finding is in line with the theory of consumer behaviour. Additionally, the price of tourism in Malaysia and the substitute price of tourism had a negative

impact on the demand for tourism in Malaysia. Furthermore, it was also observed that environmental pollution and crime had a negative effect on tourism demand in Malaysia. Finally, the empirical results also show that qualitative factors such as the *Malaysia Truly Asia* campaign had a positive effect on tourism demand while the September 2001 incident and health epidemic diseases such as SARS had a negative impact on tourism demand in Malaysia.

6.2 Policy Recommendations

In this section, policy recommendations based upon the findings in Chapter 3, Chapter 4 and Chapter 5 are delineated.

The findings in Chapter 3 showed that tourism-led growth hypothesis is valid, implying that tourism is a potential catalyst of growth to the Malaysian economy at the aggregate context. The findings in Chapter 4 revealed that only 10 out of 12 tourism markets show strong and stable evidence of supporting the tourism-led growth hypothesis in Malaysia. Based on these findings, it is suggested that tourism marketing policies should target those tourism markets that firmly support Malaysia's economic growth. This could help in the attainment of one of the objectives of the Tenth Malaysia Plan 2011-2015, i.e. to enhance the role of tourism in economic growth. In order to enjoy the benefits of tourism on economic growth, it is proposed that the Ministry of Tourism in Malaysia provides more competitive tour packages to attract genuine international tourists from the target countries. Moreover, priority must be accorded to the upgrading of tourist-related infrastructures. Such prioritisation should include the setting up of more tourist information centres, providing better accommodation as well as a good transportation system because they are the key elements to facilitate the growth of the tourism sector.

Apart from that, educational institutions such as universities in Malaysia could also be encouraged to organise more educational programmes and international conferences because these activities would attract more international students and researchers to either enrol in local tertiary institutions, attend conferences or engage in research collaborations. Concomitantly, this is also in line with efforts to promote Malaysia as a hub for educational excellence in Asia and the Pacific region, particularly for tertiary education and research collaboration. By embarking on such initiatives, more genuine international tourists can be attracted to the country and the contribution of tourism to Malaysia's economic growth can be optimised.

The findings in Chapter 5 clearly emphasise that there is a set of key factors that need to be seriously taken into account by the Malaysian government and industry stakeholders. This is because these emphasised factors are directly related to the formulation of effective tourism marketing policies not only to attract international tourist arrivals, but also to provide comfortable services to tourists. Generally, this study has identified that income, price of tourism in Malaysia, the price of alternative tourism destination (also known as substitute price of tourism), pollution, crime, *Malaysia Truly Asia* campaign, the terrorist attack incident on September 2011 and the outbreak of SARS are important in explaining the demand for inbound tourism in Malaysia. A set of policy recommendations can be derived from this finding.

In line with the theory of consumer behaviour, the empirical results of this study reveal that income has a significant positive impact on tourism demand in Malaysia. In addition, income elasticity is greater than unity, implying that Malaysia is a luxury tourism product. Nevertheless, tourist' income level is beyond the control of the Malaysian government as it is highly dependent on the global economic environment

and also the policies implemented by the governments in the 12 major tourist-generating countries under review.

For the price of tourism in Malaysia, the results of this study show that price of tourism in Malaysia has a significant negative impact on tourism demand in Malaysia. In light of this, a decrease in the price of tourism in Malaysia would effectively attract international tourist arrivals. Likewise, any increase in the price of tourism in Malaysia would harm the demand for inbound tourism. In order to control the price level (or inflationary phenomenon), the Malaysian government may implement a contractionary monetary policy. This macroeconomic policy recommendation is associated with the empirical findings of Tan and Cheng (1995) and Tang (2004), who highlight that inflation in Malaysia is a monetary phenomenon. Therefore, implementing a contractionary monetary policy would be an effective macroeconomic policy to reduce price levels in Malaysia. However, although a contractionary monetary policy may reduce the price level, it also slows down the process of economic growth and development. Alternatively, the government may consider using supply-sides policies such as tax cuts for investors and entrepreneurs in tourism-related industries to provide them incentives to invest and expand their business. This will help increase output levels and reduce price levels. Apart from macroeconomic policies, the Malaysian government should also monitor and formulate a policy guideline for pricing to ensure that all travel and tour agencies are charging a reasonable price for the services they provide to tourists. In addition, hotel costs must also be kept affordable because accommodation is one of the largest components of tourists' expenses. In order to attract budget travellers, Malaysia's government should also encourage the establishment of more budget hotels that provide affordable accommodation. This may

not only increase the number of international tourist arrivals, but also encourage them to stay longer in Malaysia due to the low accommodation costs.

Besides price of tourism in Malaysia, the findings of this study also suggest that substitute price of tourism has a negative impact on tourism demand in Malaysia. This study also noted that Indonesia, Singapore, Thailand and the Philippines are complementary tourism destinations to Malaysia. Since they are complementary tourism destinations, an increase in the price of tourism in any of the complementary tourism destinations would reduce tourism demand in Malaysia. Instead of competing among countries to obtain a share of the tourism market, it is best for the Malaysian government to cooperate with the neighbouring countries. In order to attract international tourist arrivals, the Malaysian government should encourage strong regional partnerships among governments and the tourism industry stakeholders, especially in Indonesia, Singapore, Thailand and the Philippines because they are complementary tourism destinations to Malaysia. Specifically, the governments of these countries may jointly organise tourism campaigns to further promote the tourism industry in the ASEAN-5 region by emphasising the unique culture, food and lifestyles found within the region. As ASEAN-5 countries are geographically close to each other, the governments may also subsidise tourism agencies to provide more cross-border tourism packages to attract global tourists. In doing so, tourists would be able to visit the ASEAN countries in a single trip.

In terms of pollution, the results of this study reveal that environmental pollution (i.e. CO_2 emission) negatively affected the demand for inbound tourism in Malaysia. This indicates that improving environmental quality such as reducing the level of CO_2 emission in Malaysia would influence tourists' decision to choose Malaysia as their

visiting destination. To combat environmental pollution such as CO_2 emissions, policymakers may impose a carbon tax on polluters, initiate an emission trading programme and provide tax incentives to firms that use less fossil fuel and/or invest in energy-saving technologies. In addition, environmental regulations should be strictly enforced while incentives should be provided to encourage the adoption of green technologies. Consequently, environmental quality in Malaysia is improved which in turn would lead to an increase in the demand for inbound tourism.

Apart from that, this research also discovers that an increase in the crime rate would affect a negative demand for tourism in Malaysia because tourists are likely to be concerned about personal safety and security when choosing a tourism destination. For this reason, reducing the crime rate will spur an influx of more genuine international tourists. According to Becker (1968), unemployment is positively related to the crime rate because when an individual is unemployed, the marginal return from legitimate earning activities are lower than before, thus one is more likely to engage in criminal activities. Tang and Lean (2007) and Tang (2009, 2010a) added that apart from unemployment, crime was also driven by inflation because inflation reduces purchasing power and increases the cost of living. Consequently, an individual is unable to maintain his/her standard of living and tempted to resort to criminal activities to maintain his/her lifestyle. Therefore, any policy initiative that aims to reduce inflation and unemployment rates would also reduce the crime rate in tandem. In view of this, the Malaysian government should consider using supply-sides policies to mitigate crime as such policies will simultaneously reduce both inflation and unemployment rates without having deleterious effects on economic growth. However, since the economics of crime deterrence are not exclusive, thus other crime prevention strategies should also be considered by the policymakers to comprehensively eradicate crime in Malaysia. In

order to build a peaceful and safe community, crime prevention strategies such as increased frequency of patrols and enhanced number and visibility of security personnel, especially in crime prone areas must be implemented. In addition, more closed-circuit television (CCTV) should also be installed in crime prone areas. Indeed, crime prevention is a collective responsibility and hence cooperation between police and Malaysians is essential to effectively fight criminal activities in Malaysia. In doing so, Malaysia's would become a peaceful and safest city that would automatically attract more genuine international tourists to visit Malaysia.

Finally, this research also discovered that qualitative factors such as *Malaysia Truly Asia* campaign, the incident of terrorist attack on September 2011 in the United States, and the outbreak of SARS in 2003 were also crucial in explaining the demand behaviour of inbound tourism in Malaysia. The significant positive effect of *Malaysia Truly Asia* campaign revealed the success of such tourism marketing programmes in attracting international tourist arrivals to visit Malaysia. Owing to its impressive performance, the *Malaysia Truly Asia* marketing programme should be continued in order to sustain tourism demand. Besides, the results of this study also suggested that terrorism and the SARS outbreak are both negatively related to the demand for inbound tourism in Malaysia. Although these factors are beyond our control and the impact on tourism demand is transitory, the results nevertheless indicate that tourists are very concerned about issues pertaining to health and safety. In this regard, relevant government bodies such as the Royal Malaysian Police and the Ministry of Health should formulate a set of precautionary strategies to protect tourists from being affected and to ensure that the country is free from terrorism and infectious diseases. In addition, the Malaysian government may also encourage more research in order to enhance understanding of the dynamics behind the incidence of epidemics and terrorism so that

more efficacious preventive strategies can be implemented. As terrorism and the outbreak of SARS epidemic are regional issues, regional cooperation in devising common preventive strategies should also be considered to mitigate their impact on the tourism industry.

6.3 Limitations and Suggestions for Future Studies

This study is subject to several limitations that could be further examined by future studies.

Firstly, this study principally analyses the issue from a macroeconomic perspective per se and only provides a general view of the behaviour of inbound tourism demand in Malaysia. Hence, it is suggested that future studies re-examine the issue by using micro level data such as survey data of inbound tourists. In doing so, such findings would be more precise and informative compared to studies reliant on macro data.

The second limitation pertains to the category of tourism. This research only focused on inbound tourism and did not consider domestic tourism in Malaysia. As such the role of domestic tourism in economic growth and the demand behaviour of domestic tourism in Malaysia are beyond the scope of this research. Moreover, long span of time series data for domestic tourism is non-existent and data for domestic tourism is also very difficult to obtain. Therefore, it is suggested that future studies consider the impact of domestic tourism on Malaysia's economic growth and the demand for domestic tourism in Malaysia when such data is available.

The third limitation relates to the choice of explanatory variable(s) in modelling the demand for inbound tourism. This study did not attempt to consider trade openness in modelling the demand for inbound tourism in Malaysia because this is beyond the interest of this study. Furthermore, the inclusion of trade openness may cause over-parameterisation problems as the present demand model for inbound tourism consists of 8 explanatory variables, and the sample size of this study is relatively small. Therefore, this can be an important agenda of the future research on tourism demand in Malaysia, especially when large datasets are available.

The fourth shortcoming of the present research relates to data collection. In Chapter 4, this study employed the data of international tourist arrivals instead of tourism receipts to analyse the validity as well as the stability of the tourism-led growth hypothesis at the disaggregated level. It is noted that relying on international tourist arrivals data to analyse the tourism-led growth hypothesis has inherent weaknesses as not all arrivals are genuine tourists. Unfortunately, the data for tourism receipts are unavailable in the disaggregated form, especially those of the high frequency (i.e. monthly and quarterly) variety. Therefore, future studies may consider re-visiting the tourism-led growth hypothesis in Malaysia when such disaggregated data on tourism receipts are available.

The last limitation of this study is associated to the lack of an appropriate theoretical framework, especially for the tourism-led growth hypothesis. Indeed, the growth theories were principally constructed based upon production function of a set of factors of production such as labour, capital and R&D as explanatory variables. However, the present study relates economic growth to tourism and real exchange rate, which is not a solid growth model to analyse the validity of the tourism-led growth hypothesis in Malaysia. Hence, the empirical results of this study can only suggest that there are

correlations between the candidate variables, but they are not necessarily the drivers of the economic growth as considered by the growth theories. In light of this, the conclusion of this study pertaining to the existence of the tourism-led growth hypothesis in Malaysia should be accepted with caution. Perhaps, future studies may re-examine the topic based upon a more proper theoretical framework. In doing so, the estimation results would be more robust and reliable.

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LIST OF PUBLICATIONS AND PAPERS PRESENTED

The main ideas and certain sections of this Ph.D research have been published in several ISI-WoS indexed journals and also presented at the international academic conferences as per the following list:

1. Tang, C.F. (2010). Old wine in new bottles: Are Malaysia tourism markets converging?. *Asia Pacific Journal of Tourism Research*, 16(3), 263-272, 2011.

2. Tang, C.F. (2011). Is the tourism-led growth hypothesis valid for Malaysia? A view from disaggregated tourism markets. *International Journal of Tourism Research*, 13(1), 97-101, 2011.

3. Tang, C.F. (2013). Temporal Granger causality and the dynamics relationship between real tourism receipts, real income and real exchange rates in Malaysia. *International Journal of Tourism Research*, 15(3), 272-284, 2013.

4. Tang, C.F., & Tan, E.C. (2013). How stable is the tourism-led growth hypothesis in Malaysia? Evidence from disaggregated tourism markets. *Tourism Management*, 37, 297-305.

5. Tang, C.F., & Tan, E.C. (2012). Modelling the demand for tourism in Malaysia. Paper presented at the *USM-AUT International Conference 2012: Sustainable Economic Development, Policies and Strategies*, Penang, Malaysia.

6. Tang, C.F., & Tan, E.C. (2013). Modelling the demand for Malaysia's inbound tourism. Paper presented at the *5th International Conference on Humanities and Social Sciences 2013: Intercultural Transition into ASEAN Community*, Hatyai, Thailand.

7. Tang, C.F., & Tan, E.C. (2013). Tourism and economic growth in Malaysia: Further empirical viewpoint. Paper presented at the *International Conference on Business, Accounting, Finance and Economics (BAFE 2013)*, Perak, Malaysia.

APPENDIX A: Supplementary Results for Chapter 3

Table A.1: The Results of ARDL Cointegration Tests

Panel A: Bounds testing to cointegration		
	Optimal lag structure	F-statistic
$F_Y\left(Y\middle\vert TR, RER\right)$	(2, 2, 1)	7.786***
Significance level	Critical values (T = 35)[#]	
	Lower bounds $I(0)$	Upper bounds $I(1)$
1 per cent level	6.140	7.607
5 per cent level	4.183	5.333
10 per cent level	3.393	4.410
Panel B: Diagnostic tests	Statistics	
R^2	0.704	
Adjusted-R^2	0.569	
F-statistics	5.229***	
χ^2_{NORMAL}	3.234	
χ^2_{SERIAL}	[1]: 0.071; [2]: 0.510	
χ^2_{ARCH}	[1]: 0.003	
χ^2_{RESET}	[1]: 1.309	

Note: The asterisk *** denote the significance at the 1 per cent level. The optimal lag structure is determined by AIC. Figure in parenthesis [ ] is the order of diagnostic tests. # Critical values for small sample are collected from Narayan (2005).

Table A.2: Diagnostic Tests on ECMs

Tests	Dependent variables		
	$\Delta \ln Y_t$	$\Delta \ln TR_t$	$\Delta \ln RER_t$
χ^2_{NORMAL}	3.425	3.179	0.593
χ^2_{SERIAL}	[1]: 0.068; [2]: 0.489	[1]: 0.126; [2]: 0.221	[1]: 1.401; [2]: 1.437
χ^2_{ARCH}	[1]: 0.007	[1]: 0.484	[1]: 0.354
χ^2_{RESET}	[1]: 0.794	[1]: 0.373	[1]: 0.124
CUSUM	Stable at 5 per cent	Stable at 5 per cent	Stable at 5 per cent
CUSUMSQ	Stable at 5 per cent	Stable at 5 per cent	Stable at 5 per cent

Note: Figure in parenthesis [ ] represents the order of diagnostic tests.

Table A.3: The Results of TYDL Granger Causality Tests

Null hypothesis	Likelihood ratio (LR) statistics	Bootstrap critical values		
		1 per cent	5 per cent	10 per cent
$\ln TR \not\rightarrow \ln Y$	15.092**	19.2834	14.3689	12.055
$\ln Y \not\rightarrow \ln TR$	1.344	8.0026	4.1301	3.0460
$\ln TR \not\rightarrow \ln RER$	13.904*	19.4936	14.5436	11.6828
$\ln RER \not\rightarrow \ln TR$	13.019*	21.6960	13.3543	10.7305
$\ln Y \not\rightarrow \ln RER$	13.390**	18.5175	12.4524	9.7378
$\ln RER \not\rightarrow \ln Y$	24.458***	18.0973	12.2320	10.2298

Note: The asterisks ***, ** and * denote significance at the 1, 5 and 10 per cent levels, respectively. Following the Davidson and MacKinnon (2004) suggestion, we use 1000 times of replication to generate the bootstrap critical values for small samples.

APPENDIX B: Supplementary Results for Chapter 4

Table B.1: The Results of ARDL Cointegration Tests for Taiwan

Panel A: Bounds testing to cointegration		
	Optimal lag structure	F-statistic
$F_Y\left(Y \mid VA, RER\right)$	(12, 10, 12)	5.505**
Significance level	Critical values[#]	
	Lower bounds $I(0)$	Upper bounds $I(1)$
1 per cent level	5.150	6.360
5 per cent level	3.790	4.850
10 per cent level	3.170	4.140
Panel B: Diagnostic tests	Statistics	
R^2	0.667	
Adjusted- R^2	0.597	
F-statistics	9.492***	
χ^2_{NORMAL}	0.997	
χ^2_{SERIAL}	[1]: 1.344; [2]: 1.568	
χ^2_{ARCH}	[1]: 2.860	
χ^2_{RESET}	[1]: 0.039	

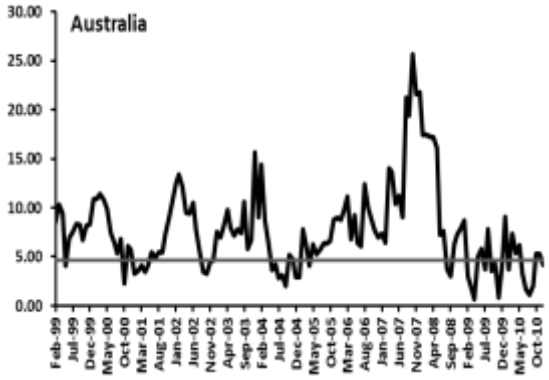
Note: The asterisks *** and ** denote the significance at the 1 and 5 per cent levels, respectively. The optimal lag structure is determined by AIC. Figure in parenthesis [ ] is the order of diagnostic tests. # Case III: Unrestricted intercept and no trend critical values are collected from Pesaran, Shin and Smith (2001).

Table B.2: Diagnostic Tests on ECMs

Dependent variable: $\Delta \ln Y_t$	χ^2_{NORMAL}	χ^2_{SERIAL}	χ^2_{ARCH}	χ^2_{RESET}
Australia	3.469	[2]: 2.972	[1]: 3.363	[1]: 0.123
Brunei	3.073	[2]: 1.946	[1]: 3.147	[1]: 0.422
China	4.545	[2]: 4.203	[1]: 2.548	[1]: 2.626
Germany	2.872	[2]: 2.185	[1]: 3.396	[1]: 0.435
Indonesia	4.068	[2]: 2.953	[1]: 2.785	[1]: 2.569
Japan	5.013	[2]: 1.792	[1]: 1.154	[1]: 0.900
Singapore	5.073	[2]: 0.885	[1]: 0.882	[1]: 0.122
South Korea	5.052	[2]: 1.639	[1]: 1.728	[1]: 0.637
Taiwan	3.588	[2]: 1.889	[1]: 1.132	[1]: 0.483
Thailand	0.286	[2]: 1.601	[1]: 1.511	[1]: 2.329
UK	3.264	[2]: 2.393	[1]: 3.546	[1]: 0.380
USA	2.713	[2]: 1.344	[1]: 3.365	[1]: 0.434

Dependent variable: $\Delta \ln VA_t$	χ^2_{NORMAL}	χ^2_{SERIAL}	χ^2_{ARCH}	χ^2_{RESET}
Australia	1.687	[2]: 1.194	[1]: 0.573	[1]: 1.595
Brunei	4.592	[2]: 0.495	[1]: 3.129	[1]: 0.601
China	2.798	[2]: 1.426	[1]: 2.338	[1]: 0.516
Germany	2.379	[2]: 0.838	[1]: 2.133	[1]: 3.758
Indonesia	3.108	[2]: 2.017	[1]: 1.964	[1]: 0.232
Japan	2.836	[2]: 1.475	[1]: 1.515	[1]: 0.558
Singapore	3.508	[2]: 2.813	[1]: 3.721	[1]: 0.444
South Korea	3.534	[2]: 2.543	[1]: 3.703	[1]: 0.019
Taiwan	4.130	[2]: 1.368	[1]: 0.431	[1]: 0.016
Thailand	3.331	[2]: 1.118	[1]: 2.702	[1]: 0.026
UK	1.918	[2]: 0.020	[1]: 0.785	[1]: 0.235
USA	1.557	[2]: 1.231	[1]: 3.679	[1]: 1.251

Note: Figure in parenthesis [ ] represents the order of diagnostic tests.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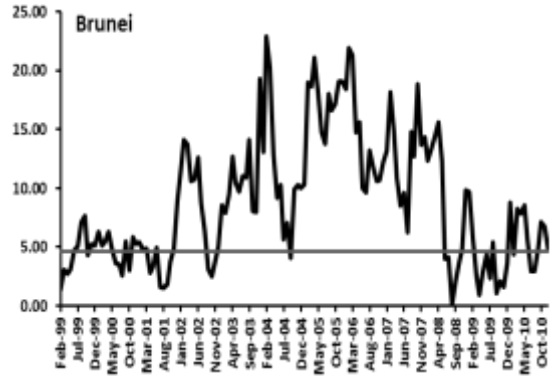
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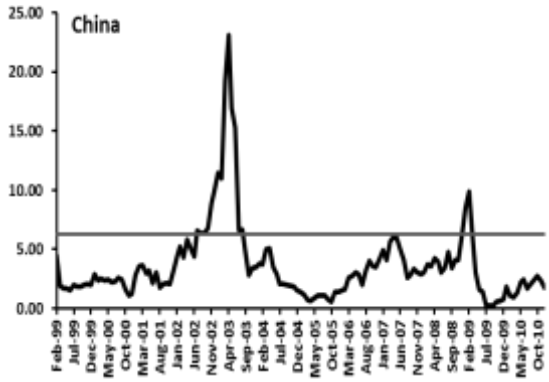
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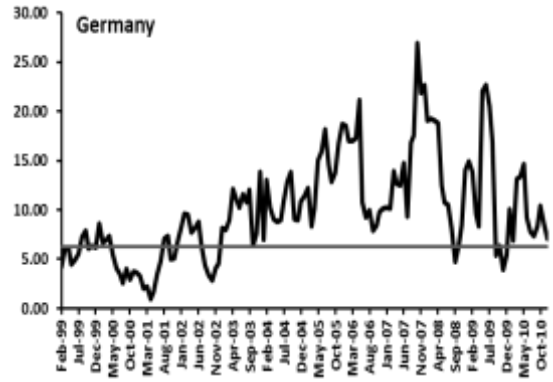
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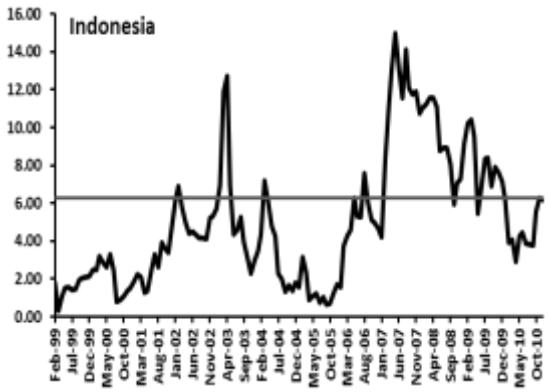
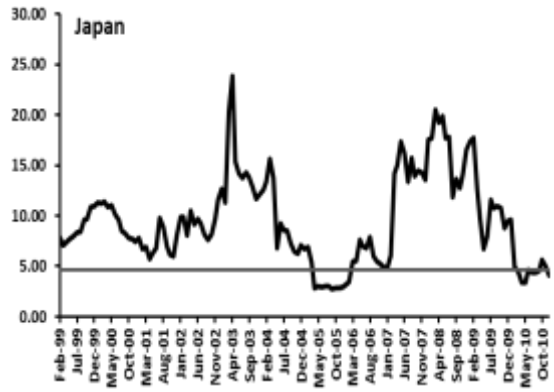
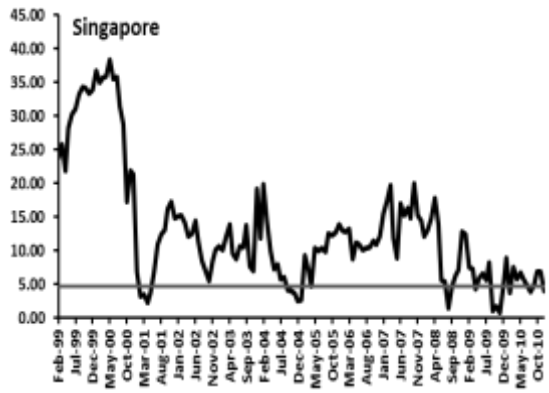

Indonesia


Japan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South Korea

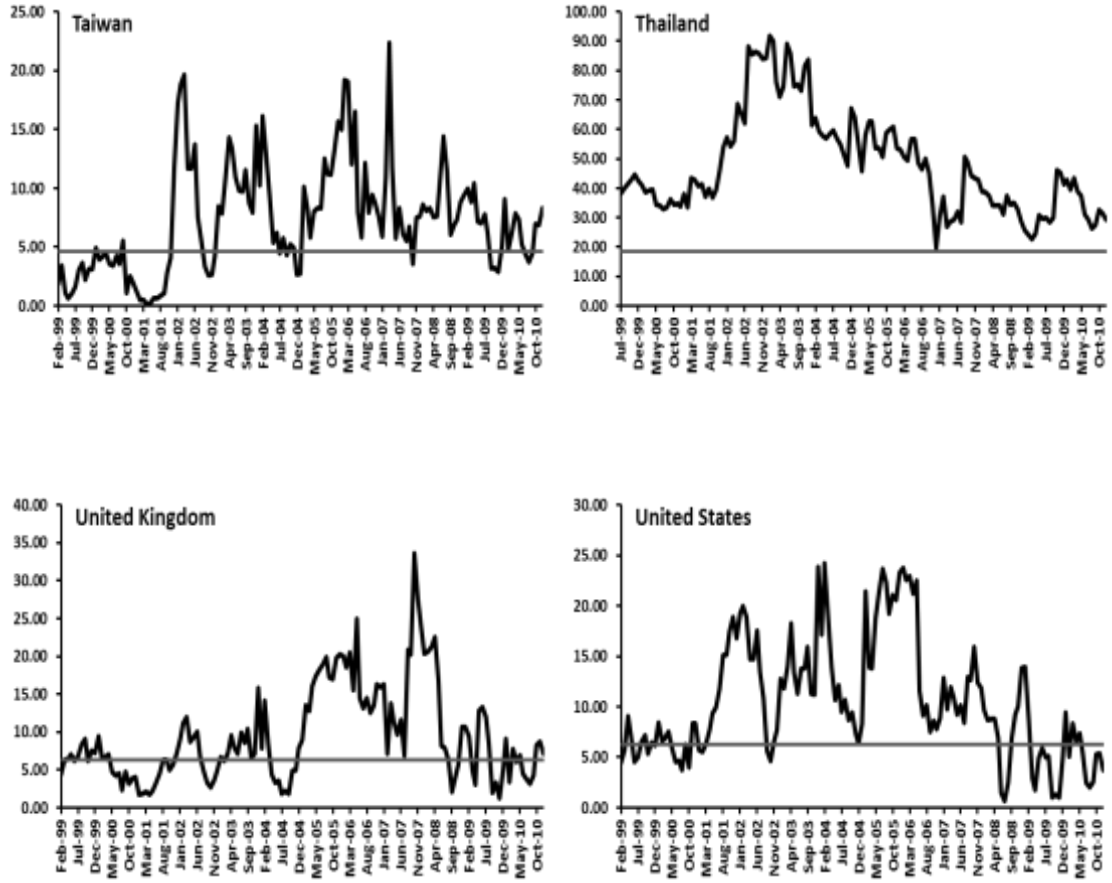

Figure B.1: Plots of the Rolling Granger Causality Tests
(Rolling Window = 50 observations)

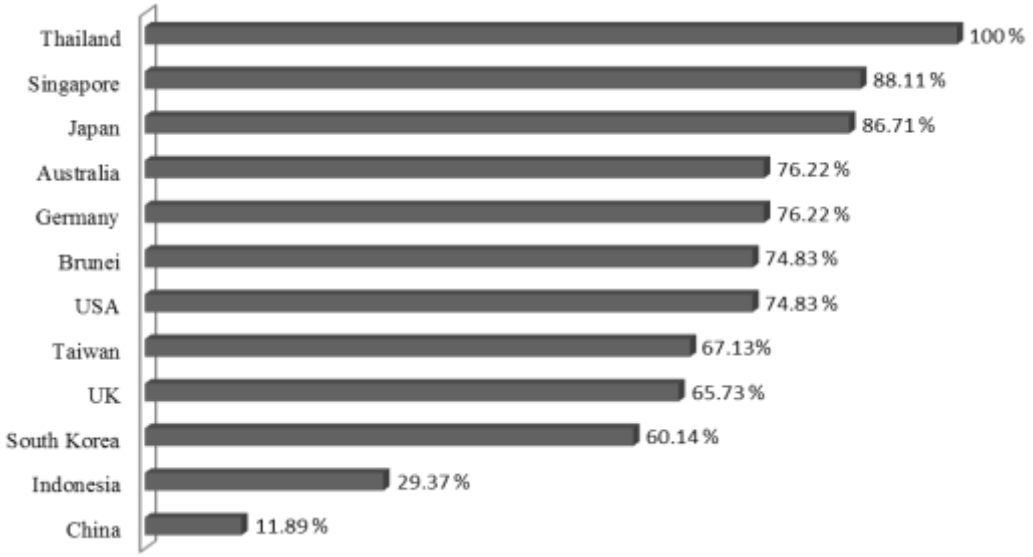

Figure B.2: Summary of Rejection Frequencies of the Rolling Granger Causality Tests

APPENDIX C: Supplementary Results for Chapter 5

Table C.1: The Results of Bootstrap Range Test for Poolability

Explanatory variables	Range	Bootstrap *p*-values
$\ln GDP_{jt}$	0.930	0.9700
$\ln P_{MAL,t}$	1.839	0.2340
$\ln P_{SUB,t}$	1.926	0.0930
$\ln POL_{MAL,t}$	1.751	0.2440
$\ln CR_{MAL,t}$	1.732	0.2150
DMTA	1.102	0.6070
*D*911	1.477	0.2850
SARS	1.097	0.2930
Maximum of the individual ranges	1.926	0.331

Note: This newly developed poolability test is proposed by Di Iorio and Stefano (2012). This poolability test is computed using a procedure written in GAUSS. The bootstrap *p*-values are generated by sieve bootstrap procedure with 1000 times of replication.