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**THE ECONOMIC ANALYSIS
OF MEDICAL TOURISM IN THAILAND:
OPPORTUNITIES, CHALLENGES AND IMPACTS**

Kansinee Guntawongwan



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Doctoral Programme of
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Kansinee Guntawongwan

Thesis Supervisor: Vicente Ramos
Thesis Supervisor: Javier Rey-Maquierira
Thesis Supervisor: Mingsarn Kaosa-ard

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ABSTRACT

Medical tourism experienced a rapid growth in Thailand, particularly after the 1997's Asian financial crisis. Both, public authorities and private companies soon became aware of this segment's potential, which explains why it received considerable attention in destination's strategic plans, and attracted private investment. However, more destinations became interested in attracting medical tourism, as it shifted from a minor niche, to a segment with huge capacity to generate value. Hence, there has been a remarkable increase in international competition in recent years.

The development of medical tourism was followed by academic interest. However, the analyses are usually constrained due to two common problems: unclear conceptual definition and limited data availability.

The first challenge of this PhD was to face this common limitation. Hence, the initial research focus was centered in clarifying the conceptual definition of medical tourism. After proving that available data in Thailand was not appropriate to perform a detail study, the second research task was to generate primary data that can be used throughout the analyses. Two sets of data were generated by the researcher: First, a series of in-depth interviews with the administrators of private providers in Thailand were planned and executed. Second, a questionnaire to medical tourists was designed, tested, and implemented.

Once the data was generated, this dissertation proposes a holistic study of the medical tourism phenomenon in Thailand using diverse analytical methods to investigate demand, supply and competitiveness.

The study is initiated by extending the comprehension of Thailand medical tourism demand. The questionnaire showed that reasonable price of treatments, and cost of living, were the main reasons to choose Thailand. The average length of stay, and expenditure were two times higher than for general tourists. Respondents felt that overall medical services in Thailand were worthwhile in terms of money and time; and the level of satisfaction and loyalty was high. A grey model was selected to forecast

future demand, as it is the appropriate technique when there is a limited number of observations.

A structural equation model (SEM) is applied to investigate the causal relationship between motivation, experiences, and future behavior intention of medical tourists. The results revealed that satisfaction had the highest total effect on behavior intention, while service experience was the main factor affecting overall satisfaction. The country motivation was the key factor affecting visitors' perceived value. Whereas hospital motivation was the major factor that affected medical service experience.

Finally, the study of supply and competitiveness analysis estimated that medical tourists were approximately ten percent of all foreign patients. The long experience in attending foreign patients, and appropriate medical and tourism endowments are the determinants that enhance Thailand's competitiveness. The significant strengths of Thailand are hospital standards, tourism resources and local hospitality, and cost of treatments. However, its weaknesses are the absence of a clear image of treatments' specialization, language limitations of medical personnel, and the lack of cooperation between related agencies. The benchmarking with major competitors in Asia showed that Thailand has an advantage in tourism endowment while other competitors have advantages in different aspects. Asian medical tourism has been presented as comprised by niche markets, where destinations position themselves differently. Hence, private providers focus more on domestic competition than on international competition.

The policy recommendations to accommodate the potential future development of Thailand's medical tourism are to increase the domestic production of medical personnel, and to coordinate the activities of the relevant public agencies in medical tourism. In addition, a comprehensive and precise database on medical tourism should be created to be able to extend the analyses presented in this research, and monitor the future evolution of this segment.

RESUMEN

El turismo médico ha experimentado un rápido crecimiento en Tailandia, particularmente después de la crisis financiera asiática de 1997. Las autoridades públicas y las empresas privadas se dieron cuenta pronto del potencial de este segmento. Esto se tradujo en su integración en los planes estratégicos del destino y en la atracción de inversión privada. Cuando el turismo médico pasó de ser un nicho menor, a un segmento con enorme capacidad de generar valor más destinos internacionales se interesaron por él. En consecuencia, en los últimos años ha habido un notable aumento de la competencia internacional.

El desarrollo del turismo médico fue seguido por el interés académico. Sin embargo, estos análisis suelen estar limitados por dos problemas comunes: una definición conceptual poco clara y escasa disponibilidad de datos.

El primer desafío de este doctorado fue afrontar estas limitaciones comunes. Por lo tanto, el enfoque inicial de la investigación se centró en aclarar la definición conceptual de turismo médico. Después de comprobar que los datos disponibles en Tailandia no eran apropiados para realizar un estudio detallado, la segunda tarea de investigación fue generar datos primarios que se pudieran utilizar en un análisis riguroso. El candidato generó dos conjuntos de datos: En primer lugar, se planificaron y realizaron una serie de entrevistas en profundidad con los administradores de los proveedores privados en Tailandia. En segundo lugar, se diseñó, testó e implementó un cuestionario a turistas médicos.

Una vez generados los datos, esta tesis propone un estudio holístico del fenómeno del turismo médico en Tailandia utilizando diversos métodos analíticos para investigar la demanda, la oferta y la competitividad.

El estudio se inicia ampliando la comprensión de la demanda de turismo médico de Tailandia. El cuestionario mostró que el precio razonable de los tratamientos y el coste de vida fueron las principales razones para elegir Tailandia. La duración media de la estancia y el gasto fueron dos veces superiores al conjunto de turistas. Los

encuestados consideraban que los servicios médicos en general en Tailandia valían la pena en términos de dinero y tiempo; Y el nivel de satisfacción y lealtad era alto. Se seleccionó un Grey Model para predecir la demanda futura, ya que es la técnica apropiada cuando hay un número limitado de observaciones.

Se aplica un modelo de ecuaciones estructural (SEM) para investigar la relación causal entre la motivación, las experiencias y el comportamiento futuro de los turistas. Los resultados revelaron que la satisfacción tuvo el mayor efecto total sobre el comportamiento futuro, mientras que la experiencia de servicio fue el principal determinante de la satisfacción. La motivación-país fue el factor clave para el valor percibido. Por último, la motivación-hospital fue factor clave para la experiencia de servicio.

Finalmente, el estudio oferta y competitividad estimó que los turistas médicos eran aproximadamente el diez por ciento del total de pacientes extranjeros. La larga experiencia en la asistencia a pacientes extranjeros, y los adecuados recursos médicos y turísticos son los determinantes que mejoran la competitividad de Tailandia. Los puntos fuertes de Tailandia son la acreditación de sus hospitales, los recursos turísticos, la hospitalidad local, y el coste de los tratamientos. Sus debilidades son la ausencia de una imagen clara de la especialización en algunos tratamientos, las limitaciones lingüísticas del personal médico y la falta de cooperación entre las agencias relacionadas. La comparación entre los principales competidores en Asia mostró que Tailandia tiene una ventaja en la dotación turística, mientras que otros competidores tienen ventajas en diferentes aspectos. El turismo médico asiático se ha presentado como segmentado por nichos de mercado en los que los destinos se posicionan de manera diferente. Por lo tanto, los proveedores privados se centran más en la competencia interna que en la competencia internacional.

Las recomendaciones de política para el desarrollo futuro del turismo médico en Tailandia son aumentar la producción doméstica de personal médico, y coordinar las actividades de las agencias públicas relevantes en este segmento. Además, debe crearse una base de datos completa sobre turismo médico para poder ampliar los análisis presentados en esta investigación, y evaluar la evolución de este segmento.

RESUMEN

El turisme mèdic ha experimentat un ràpid creixement a Tailàndia, particularment després de la crisi financera asiàtica de 1997. Les autoritats públiques i les empreses privades es van adonar aviat del potencial d'aquest segment. Això es va traduir en la seva integració en els plans estratègics de la destinació i en l'atracció d'inversió privada. Quan el turisme mèdic va passar de ser un nínxol menor, a un segment amb enorme capacitat de generar valor, més destinacions internacionals es van interessar per ell. En conseqüència, en els últims anys hi ha hagut un notable augment de la competència internacional.

El desenvolupament del turisme mèdic va ser seguit per l'interès acadèmic. No obstant això, aquestes anàlisis solen estar limitats per dos problemes comuns: una definició conceptual poc clara, i escassa disponibilitat de dades.

El primer repte d'aquest doctorat va ser afrontar aquestes limitacions comuns. Per tant, l'enfocament inicial de la investigació es va centrar en aclarir la definició conceptual de turisme mèdic. Després de comprovar que les dades disponibles a Tailàndia no eren apropiats per a realitzar un estudi detallat, la segona tasca d'investigació va ser generar dades primàries que es poguessin utilitzar en una anàlisi rigorosa. El candidat va generar dos conjunts de dades: En primer lloc, es van planificar i van realitzar una sèrie d'entrevistes en profunditat amb els administradors dels proveïdors privats a Tailàndia. En segon lloc, es va dissenyar, testar i implementar un qüestionari a turistes mèdics.

Un cop generades les dades, aquesta tesi proposa un estudi holístic del fenomen del turisme mèdic a Tailàndia utilitzant diversos mètodes analítics per investigar la demanda, l'oferta i la competitivitat.

L'estudi s'inicia ampliant la comprensió de la demanda de turisme mèdic de Tailàndia. El qüestionari va mostrar que el preu raonable dels tractaments, i el cost de vida van ser les principals raons per triar Tailàndia. La durada mitjana de l'estada i la despesa van ser dues vegades superiors al conjunt de turistes. Els enquestats

consideraven que els serveis mèdics a Tailàndia valien la pena en termes de diners i temps; I el nivell de satisfacció i lleialtat era alt. Es va seleccionar un Grey Model per predir la demanda futura, ja que és la tècnica apropiada quan hi ha un nombre limitat d'observacions.

S'aplica un model d'equacions estructural (SEM) per investigar la relació causal entre la motivació, les experiències i el comportament futur dels turistes. Els resultats van revelar que la satisfacció va tenir el major efecte total sobre el comportament futur, mentre que l'experiència de servei va ser el principal determinant de la satisfacció. La motivació-país va ser el factor clau per al valor percebut. Finalment, la motivació-hospital va ser factor clau per a l'experiència de servei.

Per últim, l'estudi d'oferta i competitivitat estimar que els turistes mèdic eren aproximadament el deu per cent del total de pacients estrangers. La llarga experiència en l'assistència a pacients estrangers, i els adequats recursos mèdics i turístics són els determinants que milloren la competitivitat de Tailàndia. Els punts forts de Tailàndia són l'acreditació dels seus hospitals, els recursos turístics, l'hospitalitat local, i el cost dels tractaments. Les seves debilitats són l'absència d'una imatge clara de l'especialització en alguns tractaments, les limitacions lingüístiques del personal mèdic i la manca de cooperació entre les agències relacionades. La comparació entre els principals competidors a Àsia va mostrar que Tailàndia té un avantatge en la dotació turística, mentre que altres competidors tenen avantatges en diferents aspectes. El turisme mèdic asiàtic s'ha presentat com segmentat per nínxols de mercat en els que les destinacions es posicionen de manera diferent. Per tant, els proveïdors privats se centren més en la competència interna que en la competència internacional.

Les recomanacions de política per al desenvolupament futur del turisme mèdic a Tailàndia són augmentar la producció domèstica de personal mèdic, i coordinar les activitats de les agències públiques rellevants en aquest segment. A més, s'ha de crear una base de dades completa sobre turisme mèdic per poder ampliar les anàlisis presentades en aquesta investigació, i avaluar l'evolució d'aquest segment.

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Chapter I

Introduction

1.1 Introduction

Medical tourism is an emerging niche tourism product which has grown rapidly over the past decade (Veerasoontorn, Beise-Zee and Sivayathorn, 2011; Connell, 2011; 2013; Han and Hyun, 2015; John and Larke, 2016). Even if it is very difficult to identify precisely the value of medical tourism in the global market, some recent research (Patients Beyond Borders, 2017) estimated that medical tourism accounted for an overall world value of US\$ 46-72 billion with more than 14 million medical tourists in 2015. Moreover, it is expected to increase by up to 25 percent every year for the next decade.

Medical tourism involves people traveling across the border to other countries for receiving medical services, whether it is medical treatments, cosmetics, or health check-up. Medical tourism is not new, in fact, people traveled abroad for health benefits since ancient times. There are studies discussing such movements particularly since 19th century when middle-class Europeans traveled to spa towns, thermal spring, and coastal locations (Gray and Poland, 2008; Hall, 2013), and rich people from developing countries traveled to developed countries to access better facilities and medical technology (Goodrich and Goodrich, 1987; Tucki and Cleave, 2014). However, it developed rapidly since late 1990s with an increase in patients from richer and more developed nations, traveling to less-developed countries of Asia such as India, Thailand, and Malaysia, in search of medical care generally deemed too expensive, inadequate, or unavailable at home (Connell, 2006; 2013; Manaf et al., 2015). These tourism destination countries usually combine reasonable infrastructure, hotel facilities, and attractive tourist destinations. Nevertheless, there still have the elites travel to the United States, Germany, Switzerland, and the United Kingdom for expansive but trusted medical care, especially for the complex operations which need very advanced (special) medical technology.

There is no single definition of medical tourism. Connell (2006) defined this tourism product as occurring when traveling involves a specific medical treatment,

which is substantial and usually has long-term effects. While, Hunter (2007) described medical tourism as an integration of features of the medical industry and the tourism industry at a travel destination. From the above examples, it can be seen that even if there is not a unanimous definition, it is generally accepted that medical tourism refers to a travel activity that involves a medical procedure. In other words, medical tourism is the practice of traveling across the borders to obtain health care services in other countries, which are equivalent to or better than those available in one's own country (Heung, Kucukusta and Song, 2010; Thailand Medical Tourism Cluster, 2011; Connell, 2013).

In general, the statistical reports of medical tourism in many countries always include all foreigners that received a medical treatment in a host country. Then, the extent of medical tourism tends to be overstated. That is because immigrants and other long term foreign residents in the country should not be considered as tourist following the definition of United Nations, Department of Economic and Social Affairs, Statistics Division (2010). Among those that are usually reported as medical tourists using the conventional definition, Cohen (2008) developed a five groups' classification based on the extent to which medical treatment plays a role in tourists' incentive and conducts on relative to vacationing:

- 1) *Mere tourist* is an individual who does not make any use of medical services while vacationing in the host country.
- 2) *Medicated tourist* is one who receives medical treatment for health problems incidentally occurring while traveling in the host country.
- 3) *Medical tourist proper* is an individual whose visit to the host country includes both tourism and medical treatment (for matters unrelated to the trip). This group includes tourists traveling to the host country with the purpose of receiving a treatment, as well as those deciding on such treatment once in the country.
- 4) *Vacationing patient* is an individual who visits the host country mainly to receive medical treatment, but makes incidental use of vacationing opportunities, especially during the recuperation period that follows an operation or some specific treatments.

- 5) *Mere patient* is an individual who visits the host country solely to receive medical treatment, and does not make use of any vacationing opportunities.

From the influencing work of Cohen (2008), subsequent studies attempted to provide a more precise description of what should be included or excluded in the analyses of medical tourism. Those studies emphasized that medical tourists are those who travel across an international border for medical care through their own volition, then it should exclude: those who fall ill on holidays, were resident expatriates, or those who were effectively sent abroad by health agencies due to lack of available specialists in their home country (Lunt and Carrera, 2010; Pollard, 2010).

This PhD thesis defines medical tourist as those foreign tourist who decide to receive medical services in Thailand. They may decide to undergo medical treatments in Thailand before departing from their home country or after arriving. The main reason to travel to Thailand might be completely for receiving a medical treatment or to combine it with a holiday. Hence, medical tourists in this study exclude foreign tourists who received medical services because of health problems incidentally occurring during their travel in Thailand.

1.2 The General Situation of Medical Tourism

During the past three decades, medical tourism has been growing steadily in many regions, especially Asia-Pacific. Some countries in the latter region have deliberately linked medical care to tourism by the promotion of a complementary use of health care and attractive tourism resources. Specifically, India, Singapore and Thailand have done a remarkable effort in the last decades, and they are now estimated to account for 90 percent of all medical tourism within Asia (Tucki and Cleave, 2014).

The academic literature emphasizes some key factors to explain the increasing importance of medical tourism:

- 1) *Change in demographic structure*: The rapid increase of aging population, especially in developed countries as United States, Japan, and many countries in Europe cause a demand increase for health care services, while

the supply of medical services in those countries is limited (VISA, 2014; United Nations, Department of Economic and Social Affairs, Population Division, 2015). This excess demand for medical treatment, when compare with its supply, causes long waiting lists, and pushes people in these developed countries to seek medical services abroad (Connell, 2006; 2013; John and Larke, 2016; Uçak, 2016).

- 2) *The increase of health care cost in developed countries:* These cause people from developed countries to travel abroad to receive medical treatments, which have similar standards as those in their own countries but at a lower cost (Connell, 2006; 2013; Turner, 2007; Gray and Poland, 2008).
- 3) *Impossibility of undertaking various procedures at home:* In some cases, there are medical treatments that patients cannot undergo in their home country due to legal or availability constrains, such as abortion, some forms of organ transplantation, or stem cell therapy. Then, these patients decide to take these medical treatments in other countries where the procedures are offered (Crooks et al., 2010; Manaf et al., 2015; John and Larke, 2016).
- 4) *The expansion of low-cost airlines:* This makes international travel more convenient as the travel cost is lower. Then, traveling abroad to receive medical services is more accessible (Connell, 2006).
- 5) *The rise of high quality medical care in developing countries:* There are many hospitals in developing countries, especially in Asia, that have acquired international quality accreditation of their medical services. For instance, JCI (Joint Commission International) is a United States organization with well-known international reputation regarding its standard quality of hospitals' inspection. These international certifications give developed countries' users confidence about medical service quality.

Those factors explain the steady growth of traveling abroad to receive medical services. Especially, from developed countries as United States, Australia, Russia, and other countries in Europe.

Thailand is one of the centers for medical tourism in the world (Connell, 2013; Alberti et al., 2014; Mary, 2014; Wong, Velasamy and Arshad, 2014; Ganguli and Ebrahim, 2017; Patients Beyond Border, 2017). In Asia, Thailand is among the top three major medical tourism destinations while Singapore, Malaysia, and India are its main competitors in this region (Alberti et al., 2014; Bhaidkar, 2014; Wong, Velasamy and Arshad, 2014; Ganguli and Ebrahim, 2017).

The academic literature on medical tourism in Thailand is still limited because of the two same problems which affect the analysis of this segment at the international level:

- 1) Unclear definition of what is medical tourism, which has already been discussed.
- 2) Limited data availability. Most data in Thailand refer to foreign patients, which are non-Thai citizens receiving medical services in the country, including residential expatriates, general tourists, and medical tourists. Then, this conceptual misspecification may cause an overestimation of the real importance of medical tourism. Another related problem is the difficulty to access to the patients. Even if there was a unanimous definition of medical tourists, most of them are receiving treatments in private hospitals, which are not willing to reveal the data of their patients due to the business reason. Moreover, accessing to medical tourists is difficult because they require privacy. In fact, most private hospital provides special privacy care such as an exclusive lounge separated from other patients, etc.

1.3 Data Used in This Study

The difficulties in accessing good quality data mentioned in previous section were one of the initial challenges of this dissertation. To overcome this problem, a major contribution of this research was the construction of primary data that can be used to provide an analytical discussion of medical tourism in Thailand. Hence, this dissertation combines primary and secondary data. The former is obtained from qualitative and quantitative surveys, which are explained in the following paragraphs. Secondary data were obtained from various sources, which will be summarized in section 1.3.3.

It should also be mentioned that the current dissertation is part of the research project ‘Promoting the Potential of Hi-Value Tourism Industry and Hi-Value Destination’ coordinated by the Public Policies Studies Institute (PPSI) and funded by the National Research Council of Thailand (NRCT) and the Thailand Research Fund (TRF). One of the areas of analysis of the project was the competitiveness of Thailand’s health tourism industry.

1.3.1 Qualitative data: in-depth interviews with private companies administrators

Medical tourism in Thailand is mainly operated by private hospitals, especially Bumrungrad Hospital¹ and those within the Thailand’s largest private healthcare group: Bangkok Dusit Medical Services (BDMS)². The relevance of these private operators explains why the information about this activity (type of medical tourists, their number, the revenue obtained through these services) is usually not public due to business reasons. To overcome this limitation, this study planned and executed in-depth interviews with the people who are involved in medical tourism management and provision. As previous research indicates, in a data limitation situation, a case approach which combines the evidence collected from direct observation of the events and interviews with the people involved in them is regarded as appropriate (Yin, 2003; Wong, Mistilis and Dwyer, 2011).

The structure of the interview is presented in appendix A, while the description of the process is as follows:

- 1) The researcher sent a letter to ask for the interviews with the administrators of private hospitals and other companies related with medical tourism located in the major Thailand’s cities: Bangkok, Chiang Mai, Pattaya, and Phuket. These companies were selected as they are the

¹ Bumrungrad Hospital is located in Bangkok, Thailand. It is one of the largest private hospitals in Southeast Asia, with 580 beds and over 30 specialty centers. They have 1.1 million patients annually, including over 520,000 international patients (Bumrungrad International Hospital, 2016).

² Bangkok Dusit Medical Services (BDMS) owns and manages six major hospital brands: Bangkok Hospital, Samitivej Hospital, BNH Hospital, Phyathai Hospital, Paolo Hospital and the Royal Hospital (Bangkok Dusit Medical Services, 2016).

medical tourism providers indicated in the promotional web page of the Tourism Authority of Thailand (TAT).

- 2) After sending those letters, there were twelve private hospitals, one medical assistance company, and one healthcare industry consulting company that allowed the researcher to interview with their administrators. Six of these hospitals were located in Bangkok, two in Pattaya, two in Phuket, and two in Chiang Mai³.
- 3) The researcher sent the interview agenda and made an appointment with the administrators of each private hospital and related company.
- 4) The interviews were done at their workplaces and took about one to two hours. Sadly, the interviewees did not allow us to record the interview.
- 5) Finally, the researcher sent the report of these interviews to the interviewees to verify the statements before using them in this study.

1.3.2 Quantitative data: medical tourists' questionnaire

This study used a questionnaire to collect data from the medical tourists in Thailand. The study focused solely on medical tourists who undergone treatments at five registered private hospitals⁴, which allow us to access to their patients. Medical tourists who received treatments at medical and dental clinics⁵ are excluded from this study. The reasons for restricting data collection only to private hospitals were:

- 1) The number of medical tourists who received medical services from private hospitals are more than those attending medical or dental clinics (the information was obtained from the in-depth interviews). Most of the foreign patients using treatments in clinics are residential expatriates or medicated tourists.

³ After the interviews, we found that these two private hospitals in Chiang Mai were not medical tourism providers.

⁴ Registered private hospitals are private sanatoriums that offer specialized treatments and can admit patients for overnight stays and are registered by the Ministry of Public Health.

⁵ Clinics provide medical treatments but patients cannot stay overnight.

- 2) Private hospitals provide a diversity of treatments to medical tourists. Then, we can get information about the behavior of medical tourists who undergone different treatments.
- 3) These hospitals agree to cooperate in this research and help us to identify the medical tourists.

Out of the ten hospitals treating medical tourist (exclude the two from Chiang Mai) that let us interview their managers as explain in previous section, there were only five that allowed us to access to their patients. As it has already been said, privacy in a demand for many of their patients. Regarding these five hospitals, two of them were located in Pattaya, Chonburi Province and two in Phuket Province while the other was located in Bangkok. Pattaya and Phuket are famous Thailand's tourist destinations (Cohen, 2008; Connell, 2011; Wongkit and McKercher, 2013) and have been renowned in cosmetic surgery. Bangkok is the capital of Thailand and a center of medical treatments which require advanced medical technology (Wongkit and McKercher, 2013).

The design of the questionnaire was based both, on previous literature and on the objectives of the research⁶. The draft questionnaire was then vetted by the administrators of the private hospitals that participated in the in-depth interviews to test the wording and objective of the questions. Minor revisions were made according to their suggestions. A pilot test involving 30 medical tourists was conducted in March, 2013. Cronbach's alpha coefficient is usually employed in the context of structural equations to investigate the reliability of the questionnaires⁷ (Mile and Banyard, 2007; Wongkit and McKercher, 2013). We performed such tests, and its overall value was above 0.70, which suggests a high level of reliability (Hair et al., 2010⁸).

The questionnaire (which is provided in appendix B) has two parts.

⁶ Particularly in regard to the use of structural equation model, which is the methodological approach used to study the behavior of medical tourists. The research questions and methodology will be explained in detail in Chapter III of the PhD thesis.

⁷ Further discussion is provided in Chapter III.

⁸ Hair et al. (2010) proposed that the Cronbach's alpha should have a value above 0.70.

- The first part consists of five questions.
 - Prospective respondents were asked two filtering questions to qualify them for inclusion in the final study. The first question sought to determine if they can be classified as tourist (length of stay above 12 months), while the second question asked if they sought treatment as a result of sickness, illness, or injury during their holiday. A positive response to either question invalidated the candidate.
 - The other three questions are gender, nationality, and type of treatments they undergo in the trip.
- The second part of the questionnaire consists of 26 questions, which ask socio-demographic information of the respondents, their behavior while using medical services and, finally, an assessment of the satisfaction they received and their intended future behavior.

The fieldwork data collection was done by hospitals' staffs during April to August, 2013. Before that, the researcher organized training for the collectors of the questionnaire to explain the procedures and intention of the questionnaire. Moreover, a data collection manual was prepared and distributed.

1.3.3 Secondary data sources

The secondary data gathers various sources of evidence, whether official documents as research journals and government reports, or non-official publications as articles in the website.

1.4 Structure of the Dissertation

This dissertation proposes a holistic study of the medical tourism phenomenon in Thailand, which includes demand, supply and competitiveness analysis. This PhD candidate believes that the generation of such knowledge should contribute to the understanding and management of the medical tourism product in Thailand. It can be

used by private hospitals in order to improve their services through a better understanding of the demand. Adapting the product to the client should lead to higher satisfaction and positive future behavior intention (willingness to revisit or favorable word of mouth). The results from this study could also be applied by government agencies with responsibilities at the destination level, so that they can design appropriate policies to enhance medical tourism competitiveness and promote Thailand as the Asian medical hub.

The thesis is organized in three self-contained pieces of research with the structure of an academic paper.

The first research topic aims to extend the comprehension of Thailand medical tourism demand. The chapter begins presenting the results from the analysis of the primary data that was obtained from 383 medical tourists. These findings show the characteristics and behaviors of the medical tourists in Thailand in the stage of decision-making, on-site experience, and future behavior intention. The second part of the chapter presents the estimation and forecast of medical tourists demand in Thailand considering the constraints of historical data limitation. In this sense, the discussion of the challenges related with short series and the methodological proposal is a contribution in the field of medical tourism analysis.

The third chapter attempts to illustrate the behavior of medical tourists in Thailand through the analysis of the causal relationship between motivation, experience in using medical services, and future behavior intention. Two conceptual models are used in the chapter: The first model is a partial approach which analyzes the causal relationship between experiences and future behavior intention. This model replicates previous studies on the behavior of tourists (Lee, Yoon and Lee, 2007; Chen and Chen, 2010; Han and Hyun, 2015). The second model is a complete model that analyzes the magnitude of the influence of country motivation and hospital motivation on experiences and future behavior intention of medical tourists. These two conceptual models are presented and tested using data collected from the sample described in section 1.3.2. Structural equation modeling (SEM) methodology is selected for the empirical analysis.

The supply and competitiveness analysis is presented in Chapter IV. This piece of research uses a holistic approach for analyzing and synthesizing information from

multiple sources. A case study approach disentangling the in-depth interviews described in section 1.3.1 is provided to illustrate the medical tourism market from the perspective of the private providers' administrators. It includes their views on issues such as: the share of medical tourists from total foreign patients, the reason why medical tourists choose Thailand as the medical tourism destination, which sources of information are used for decision-making, etc. The second part of the chapter discusses Thailand's medical tourism competitiveness applying both, the determinants of competitive advantage (the 'Porter's diamond' model) and a SWOT analysis. Moreover, this chapter also proposes a medical tourism competitiveness index (MTCI) based on available secondary data. This index measures the endowment and price advantage of the elements of medical tourism (medical and tourism service), and uses this index for benchmarking the medical tourism competitiveness between Thailand and its major competitors in Asia as Singapore, Malaysia, and India.

Finally, the conclusions of the dissertation are summarized in the last chapter. It presents the findings of each of the topics, and highlights the most important contributions and results.

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Chapter II

Demand Analysis of Medical Tourism in Thailand

2.1 Introduction

As it has been described in previous chapter, medical tourism has grown remarkably during past decades. Moreover, some Asia countries, such as Korea, Singapore, Malaysia, India and also Thailand, have included this tourism product into their development priorities (Lee, Han and Lockyer, 2012; Musa, Thirumoorthi and Doshi, 2012; Shahijan et al., 2015; Ganguli and Ebrahim, 2017; Miyashita et al., 2017). As with any other type of tourism activity, the understanding and forecasting of demand are crucial given the intangibility and non-storability that characterize the industry (Smith, 1994; Vanhove, 2011; Candela and Figini, 2012). For this reason, the second chapter of this PhD dissertation is devoted to the study of medical tourism demand in Thailand.

The academic literature on medical tourism demand is still limited (Lin, Lee and Huang, 2009; Peng et al., 2015). Most previous studies focused mainly on two topics, defining who should be considered as medical tourists (Wongkit and McKercher, 2013; Noree, Hanefeld and Smith, 2016), and analyzing the size of this segment (Lin, Lee and Huang, 2009; Huang, 2012; Rai, Chakrabarty and Sarkar, 2014). There are also some papers focusing on the factors that influence the travel decision to receive medical services (Ricafort, 2011; Kanittinsuttitong, 2015; John and Larke, 2016). Finally, there are a small number of academic publications that focused on the behavior of medical tourists (Johnston et al., 2010; Crooks et al., 2013; Zain et al., 2016).

Based on the type of data and the scope of the analysis, the literature can be further classifying into two levels. The first is the micro-level, which investigates tourists' characteristics and behavior at destinations such as: Thailand (Wongkit and McKercher, 2013; Noree, Hanefeld and Smith, 2014; 2016; Kanittinsuttitong, 2015), Malaysia (Musa, Thirumoorthi and Doshi, 2012; Manaf et al., 2015; Rahman and Zailani, 2016), Korea (Yu and Ko, 2012; An, 2014; Han and Hyun, 2015), India (Sultana et al., 2014), Iran (Shahijan et al., 2015), etc. The second is the macro-level, which

focuses on forecasting, trend analysis, and the estimation of the market size of medical tourism (Lin, Lee and Huang, 2009; Huang, 2012; Noree, Hanefeld and Smith, 2016).

The following paragraphs will review the most influential papers that analyzed medical tourism in Thailand.

Most micro-level studies in Thailand focused on the characteristics and classification of medical tourists. The study of Wongkit and McKercher (2013) divided medical tourists in four groups based on trip purpose and decision horizon:

- 1) *Dedicated medical tourists* are those whose visited to Thailand completely (or equally) for medical treatments and pre-planned to undergo treatments before departing from home country.
- 2) *Hesitant medical tourists* are those who had the main purpose to go to Thailand absolutely (or equally) for medical treatment but did not make the final decision to participate until arriving in Thailand. This may be because they obtained an information about medical services in Thailand and interested to take, but had some doubts about these procedures. Then they did not decide until arrive in Thailand.
- 3) *Holidaying medical tourists* are those who intended to go to Thailand completely (or mostly) for tourism but planned to undergo medical services such as health check-up or dentistry before departing from home country.
- 4) *Opportunistic medical tourists* are those who came to Thailand completely (or mostly) for tourism purpose but decided to receive medical services in Thailand after arriving. This may be because they got the information about the medical treatments of private hospitals from several sources as in-flight magazines, information counter at the airport, or free advertising brochures during travel in Thailand.

Wongkit and McKercher (2013) estimated that 60 percent of all medical tourists, correspond to dedicated and holidaying medical tourists. Hence, those who decide to receive medical services in Thailand before departing from their home country (which corresponds with the traditional categorization of medical tourists).

Wongkit and McKercher (2013) also found statistical significant different across these four groups in aspects such as: profile, type of intended treatments, motivation, decision-making process, and travel behavior. The results from this study were distinctive from previous studies, which believe that medical tourism was both a core trip purpose, and a pre-planned activity (Bookman and Bookman, 2007; Keckley, 2008). Other interesting finding from this study was that medical tourists who require invasive procedures preferred to receive their treatments in the destinations which were well-known as a center of medical treatment as Bangkok, but those who sought plastic or cosmetic surgery preferred to receive the medical services at holiday destinations as Pattaya and Phuket.

The study of Kanittinsuttitong (2015) found that medical tourists in Thailand can be divided into two main groups. The first group considered mainly tourism factors such as country's attractiveness and travel convenience. The second group focused on medical or healthcare factors (medical treatment was the main purpose) and had the limitations of health services in their home country as the main motivation factors to receive medical services in Thailand.

Noree, Hanefeld and Smith (2016) interviewed five private hospitals' medical tourists in 2012 and found that 34 percent visited Thailand solely for medical services, while 18 percent decided to undergo treatments after arriving to Thailand.

Regarding tourism demand macro-level studies in Thailand, most previous studies attempted to forecast medical tourism market size. Lin, Lee and Huang (2009) applied grey model [GM (1,1)] to forecast the revenue and number of foreign patients in Thailand, which have limited historical data. While, Huang (2012) applied GM (1,1) and GM (1,1)-Alpha to forecast the foreign patients in Thailand and other countries in Asia as Singapore and India. The above studies showed that based on the limited historical data, grey model is an appropriate methodological approach in these forecasting studies.

The study of Noree, Hanefeld and Smith (2016) tried to estimate the market size of medical tourists in Thailand by checking the attendance records of all foreign patients who received medical services in five major private hospitals. According to an unpublished survey of 55 hospitals conducted by the Thai Ministry of Commerce in 2007, these five private hospitals together took 63 percent of all foreign patients visiting Thailand while the remaining 37 percent distributed across the other 50 hospitals surveyed (Department of International Trade Promotion, Thai Ministry of Commerce, unpublished observations, 2007). The results from this study found that in 2010, approximately 10 percent of all foreign patients that reported by Thai government agency were medical tourists.

Due to the fact that there are few academic publications about medical tourism demand in Thailand, this chapter aims to comprehend Thailand medical tourism demand with two main objectives:

- The first objective is to understand medical tourists' characteristics and behavior through all the stages: decision-making, on-site experience, and future behavior intention. The information obtained from this study will be beneficial for medical tourism providers in Thailand to formulate the strategies to improve the quality of medical services, which meet the needs of medical tourists and lead to an increase of satisfaction and positive future behavior intention. Moreover, a better understanding of medical tourists' behavior could be beneficial for the Thai government and other relevant agencies as Tourism Authority of Thailand (TAT), the Department of Tourism (DOT), the Department of Export Promotion (DEP), and the Department of Health Service Support (HSS) to set the policy to achieve the goal to be the medical hub of Asia.
- The second objective aims at estimating the number of medical tourists in Thailand under the constraints of historical data limitation by applying the appropriate forecasting techniques to obtain accurate results. The information obtained from this study will be useful for the investment plan and allocation of resources in both public and private sectors to prepare the supply to accommodate to the expansion of medical tourism market.

2.2 Characteristic and Behavior of Medical Tourists in Thailand

This study defines medical tourists as foreign patients who received medical services in Thailand. Following the official definition of tourist (United Nations, Department of Economic and Social Affairs, Statistics Division, 2010), the length of stay in Thailand has to be less than twelve months. The decision to receive medical services may occur before they depart from their home country or after arriving to Thailand. These patients may travel to Thailand only for medical reasons, or they may combine a holiday with medical treatment. Nevertheless, medical tourists in this study exclude the foreign tourists who received medical services due to unexpected health problems occurring during their travel (Cohen, 2008).

Following the above definition of medical tourist, the population of this study is medical tourists receiving medical services in private hospitals, medical or dental clinics in Thailand⁹. However, there is no published information of the number of medical tourists from any agencies, so non-probability sampling technique is used to select the sample size (Saunders, Lewis and Thornhill, 2009). As it has been explained in Chapter I, data were collected using a questionnaire to interview medical tourists in five private hospitals that permit researcher access to their patients. Survey participation depends on the acceptance of these medical tourists (convenience sampling)¹⁰. Two of these hospitals were located in Pattaya, Chonburi Province and two in Phuket Province while the other was located in Bangkok. Pattaya and Phuket are famous tourist destinations. Previous studies found that most medical tourists receiving medical services in these destinations undergone plastic or cosmetic surgery (Connell, 2006; Cohen, 2008; Wongkit and McKercher, 2013). Bangkok is Thailand's capital, and a center of medical treatments. Private hospitals in this destination provide a variety of medical services such as health check-up, cosmetic surgery, or invasive procedures. Wongkit and McKercher (2013) showed that medical tourists who require invasive treatments preferred to receive their treatments in Bangkok. It should be noted that four out of the five hospitals in our study were located in tourist destinations as Pattaya and Phuket. Hence, the sample of this study will

⁹ Cohen (2008) quoted that medical tourism in Thailand is predominantly concentrated in the private medical sector which is consistent with the information obtained from the interviews with the administrators of private providers. The foreigners receiving medical services from public hospital in Thailand are usually residential expatriates.

¹⁰ Sampling method and data collection process are described in Chapter I.

represent the specific market of beauty medical tourism. Further data should be analyzed to obtain the recommendation about broader medical tourism market in Thailand.

This study did not fix the sample size in each hospital. That is because we do not know the number of population and the interviews with medical tourists are quite difficult. Most private hospitals provided exclusive services for medical tourists such as a unique lounge isolate from typical patients or particular staffs to take care them. Nevertheless, the survey which was conducted during April-August, 2013 collected a sample of 383 observations. This number is enough to apply the structural equation model (SEM) for investigate the causal relationship of medical tourism experiences and future behavior intention in Chapter III.

The remaining of the section will be separated into two parts: The first part presents the medical tourists' characteristics. The second part shows their behavior by dividing it into three stages: decision-making process, behavior during medical services (on-site experience), and future behavior intention.

2.2.1 Characteristics of the medical tourists

The objective of this part is to present the general characteristics of the medical tourists, including the information about their experience in using medical services abroad.

Table 2.1 presents the demographic characteristics of respondents in this study. The results showed that the sample included more women (87.2 percent) than men, and their average age was 32 years old. The majority of respondents were company employees (32.3 percent), followed by the self-employed people (14.5 percent), and independent professional (e.g. lawyer, doctor, etc.). The average yearly personal income (before pay tax) was US\$ 64,618. The majority of respondents were Australian (69.6 percent) followed by Russian and New Zealand respectively. In other words, the highest proportion (74.9 percent) was tourists from Oceania (Australia and New Zealand). This distribution is similar to Wongkit and McKercher (2013) where the majority of sample was Australians. Note that the above study also collected the data from the medical tourists receiving services in private hospitals located in Phuket.

Table 2.1: Demographic Characteristics

| Demographic variables | Frequency | Percentage |
|---|-----------------------------|--------------|
| 1. Gender | 368 | 100.0 |
| - Female | 321 | 87.2 |
| - Male | 47 | 12.8 |
| 2. Age (average age is 32 years old) | 359 | 100.0 |
| - Under 25 years old | 128 | 35.6 |
| - 25-34 years old | 122 | 34.0 |
| - 35-44 years old | 53 | 14.8 |
| - 45-54 years old | 31 | 8.6 |
| - 55 years and above | 25 | 7.0 |
| 3. Main occupation | 378 | 100.0 |
| - Company employee | 122 | 32.3 |
| - Self-employed person | 55 | 14.5 |
| - Independent professional (lawyer/doctor/etc.) | 45 | 11.9 |
| - Housewife | 40 | 10.6 |
| - Public servant | 28 | 7.4 |
| - Student | 27 | 7.1 |
| - Retired | 9 | 2.4 |
| - Other (e.g. hairdresser, child care, laborer) | 52 | 13.8 |
| 4. Average personal income (before pay tax) | US\$ 64,618 per year | |
| 5. Nationality | 381 | 100.0 |
| - Australian | 265 | 69.6 |
| - Russian | 32 | 8.4 |
| - New Zealand | 20 | 5.3 |
| - Omani | 19 | 5.0 |
| - European (e.g. British, Spanish, Swedish, German) | 18 | 4.7 |
| - Emirian | 8 | 2.1 |
| - American | 5 | 1.3 |
| - Japanese | 2 | 0.5 |
| - Other (e.g. South Africa, Bahraini, Chinese) | 12 | 3.1 |

Source: Survey in April-August, 2013.

We found that for 88 percent of the sample, this was their first medical treatments outside their country. From those who had experienced in using medical services abroad, 20 percent have had their medical treatments in Thailand. 60 percent of respondents with previous medical abroad used beauty services as cosmetic surgery (Table 2.2).

Table 2.2: Use of Medical Services Abroad

| Use of medical services abroad | Frequency | Percentage |
|--|-----------|--------------|
| 1. Repetition in using medical services abroad | 45 | 12.0* |
| - Reuse medical services in Thailand | 9 | 20.0 |
| 2. Type of medical services received in the last trip | 45 | 100.0 |
| - Beauty | 27 | 60.0 |
| - Dentistry | 13 | 28.9 |
| - Specialized treatment/serious disease | 5 | 11.1 |

Note: * 12.0 percent of total number of respondents (n = 376).

Source: Survey in April-August, 2013.

2.2.2 Behavior of medical tourists

The behavior of medical tourists in Thailand can be divided into three stages:

a) Decision-making process

This part displays the decision making process to receive medical services in Thailand. For example, issues such as if they make the decision before departing from their countries or after arriving to Thailand, the sources of information used, or the main reason to choose Thailand, etc.

Table 2.3 presents the relationship between medical tourists' main trip purpose and decision-making horizon. We found that the majority of respondents (82 percent) decided to receive medical services in Thailand before departing from their home country. More than 60 percent of the sample traveled solely (or mostly) for medical treatments, while 12 percent stated that tourism was the only or core reason for visiting Thailand. This findings are consistent with some previous studies (Bookman and Bookman, 2007; Keckley, 2008) in which medical treatment was the main trip purpose, and it was already planned at the home country. However, this differ from Wongkit and McKercher (2013) which found that the majority of respondents went to Thailand with completely (or mainly) purpose for a holiday. This difference may explained as Wongkit and McKercher (2013) included patients who received treatments at medical and dental clinics in which the decision is taken after arriving to Thailand. While our study focuses only medical tourists who received treatments at registered private hospitals as it was already mentioned in Chapter I.

Table 2.3: Main Trip Purpose and Decision-making Horizon

Unit: persons

| Main trip purpose | Decision-making horizon | | |
|--|-----------------------------------|-----------------------------|------------------------------|
| | Prior departure from home country | After arriving in Thailand | Total for main trip purpose |
| Completely for medical services | 96 (93.2%) | 7 (6.8%) | 103 (28.1%) |
| Mostly for medical services | 119 (95.2%) | 6 (4.8%) | 125 (34.2%) |
| Equally for medical services & tourism | 75 (79.8%) | 19 (20.2%) | 94 (25.7%) |
| Mostly for tourism | 10 (40.0%) | 15 (60.0%) | 25 (6.8%) |
| Completely for tourism | - | 19 (100.0) | 19 (5.2%) |
| Total for decision-making horizon | 300 (82.0%) | 69 (18.0%) | n = 366 |

Pearson Chi-square = 140.1 (d.f. = 4; p-value = 0.00)

Source: Author calculation.

The Chi-square analysis was used to test the relationship between main trip purpose and decision-making horizon¹¹. The null hypothesis of this test is that the main objective to go to Thailand is related with the decision-making horizon. The results of the hypothesis testing, shown in the last row of Table 2.3, revealed that medical tourists with distinct trip purpose also had a different decision-making horizon at a 5 percent statistical significance level ($\chi^2 = 140.1$, p-value < 0.05). Those who identified medical treatments as the main purpose of their trip tended to make the decision to receive treatments before departing from their home country, whereas those who traveled mostly (or completely) for holiday reasons were likely to decide to get medical services after arriving Thailand.

If we classify medical tourists based on main trip purpose according to Cohen (2008)¹², the majority of the respondents (34.2 percent) were ‘*vacationing patient*’

¹¹ In the case that the cross-tabulation contains more than four categories, the Chi-square statistic would not be accurate if more than 20 percent of the cells have an expected value below 5 (Yates, Moore and McCabe, 1999; Royston, Thyer and Padgett, 2010). In table 2.3, this condition is fulfilled, so the use of Chi-square statistic is appropriate.

¹² Explained in Chapter I.

who had medical treatments as main trip purpose, but did some tourism activities as shopping or city tour in the rehabilitation period. Nevertheless, the study of Cohen (2008) considered only one dimension (main trip purpose) to identify type of medical tourists. However, this PhD follows Wongkit and McKercher (2013) to classify medical tourists based on both, main trip purpose and decision-making horizon.

Table 2.4: Type of Medical Tourists

| Main trip purpose | Decision-making horizon | |
|---|---------------------------------------|---|
| | Prior departure from home country | After arriving in Thailand |
| Medical (equally to completely for medical treatment) | Dedicated medical tourists (96.7%) | Hesitant medical tourists (48.5%) |
| Tourism (mostly to completely for tourism) | Holidaying medical tourists (3.3%) | Opportunistic medical tourists (51.5%) |

Note: The type was classified follow Wongkit and McKercher (2013).

When considering the type of the medical tourists as shown in Table 2.4, the majority of participants (96.7 percent) were ‘*dedicated medical tourists*’ who go to Thailand mainly or totally for medical reasons and pre-planned this trip in their country. ‘*Opportunistic medical tourists*’ and ‘*hesitant medical tourists*’ shared a similar proportion (51.5 and 48.5 percent respectively). *Hesitant medical tourists* were interested in medical services in Thailand and probably searched for the information before departing from their home country. However, they make the final decision on the details in Thailand. Whereas ‘*opportunistic medical tourists*’ visit Thailand mostly (or completely) for tourism, but decide to receive medical services once in Thailand (probably influenced by some marketing channel as private hospitals advertising, in-flight magazines, freely distributed tourist publications or other media). Finally, only 3.3 percent were ‘*holidaying medical tourists*’ who go to Thailand mostly (or completely) for tourism but planned to get medical services as health check-up before departing from home country.

Table 2.5 presents several information regarding the decision-making of medical tourists in Thailand. The main reason for choosing Thailand was the low cost of treatments (66.4 percent) followed by their perceived better quality and reputation. This result is consistent with previous studies in which lower cost of treatments was an

important motivation for medical tourism (Bookman and Bookman, 2007; Horowitz and Rosensweig, 2007; Cabrera, 2010; Voigt et al., 2010). The main source of information (58.4 percent) of the majority of respondents was friends or relatives who experienced medical services in Thailand; 37.1 obtained information from medical travel agencies, and 22.3 percent used hospitals' websites. After the decision to receive medical services in Thailand was made, 57.9 percent of respondents contacted a private hospital through a medical travel agency, while 21.1 percent reserved the medical services via the hospital website, and 17.6 percent were walk-in medical tourists.

Finally, the questionnaire asked which country would have the respondents chosen if they would not come to Thailand, 50.7 percent of respondents answered Singapore, although it is not renowned for cosmetic surgery. 19.3 percent of respondents were willing to receive medical services in their home country (Australia) and 17.4 percent were interested in going to Malaysia. This result is consistent with the information from the in depth interviews with private companies administrators, as all of them agreed that Singapore was the major Thailand's competitors in medical tourism while only 3 and 2 of them (total interviewees are 12 persons) stated that Malaysia and India were also relevant competitors.

Table 2.5: The Decision-making to Receive Medical Services in Thailand

| Decision-making process | Frequency | Percentage |
|---|-------------|--------------|
| 1. Main reason for choosing Thailand | 363 | 100.0 |
| - Low cost of treatments | 241 | 66.4 |
| - Better quality and reputation of medical treatments in Thailand | 107 | 29.5 |
| - No waiting lists | 15 | 4.1 |
| 2. Source of information for deciding-making | 548* | |
| - Friends or relatives who have experienced in using medical services in Thailand | 220 | 58.4 |
| - Medical travel agency | 140 | 37.1 |
| - Hospital website | 84 | 22.3 |
| - Medical assistance company | 39 | 10.3 |
| - Referred by hospital in their country of residence | 16 | 4.2 |
| - International exhibition/Road show | 15 | 4.0 |
| - Referred by the government in their country of residence | 5 | 1.3 |
| - Other (e.g. Facebook, tourist map, internet searching) | 29 | 7.8 |

Table 2.5: The Decision-making to Receive Medical Services in Thailand (cont.)

| Decision-making process | Frequency | Percentage |
|---|------------|--------------|
| 3. The channel used to contact with the hospital | 380 | 100.0 |
| - Medical travel agent | 220 | 57.9 |
| - Booking through hospital website | 80 | 21.1 |
| - Walk-in | 67 | 17.6 |
| - Other (e.g. telephone call, representing hospital abroad) | 13 | 3.4 |
| 4. The country interested in using medical service instead of Thailand | 270 | 100.0 |
| - Singapore | 137 | 50.7 |
| - Australia | 52 | 19.3 |
| - Malaysia | 47 | 17.4 |
| - India | 9 | 3.3 |
| - Other (e.g. USA., Philippines, New Zealand, South Korea) | 25 | 9.3 |

Note: * more than one answer is possible.

Source: Survey in April-August, 2013.

This study applied Chi-square test to analyze the relationship between the type of medical tourists and their decision-making processes (e.g. type of medical services received, channel to contact with the hospital, etc.). The results showed that decision-making processes were not related with type of medical tourists at a 5 percent statistical significance level.

Another section of the questionnaire tries to evaluate which is the importance of both, country attributes and medical service attributes in the decision process. Hence, respondents were asked to use a seven-point rating scale (1 = lowest and 7 = highest) to rank the importance of different country and medical service attributes. The corresponding results are presented in the following tables.

Table 2.6 presents the importance of country attributes on the decision to choose Thailand as the medical tourism destination. The findings showed that three factors share a top position in the ranking: reasonable price of treatments, reasonable cost of stay in Thailand, and the possibility to combine tourism with medical treatment.

Table 2.6: Importance of Country Attributes on the Decision to Choose Medical Services in Thailand

| Factors influencing the decision | Average (Full mark = 7) | Percentage agree | Level |
|--|----------------------------|---------------------|-----------------|
| 1. Reasonable price of treatments | 5.99 (1) [5.87, 6.12] | 87.1 | moderately high |
| 2. Reasonable cost of stay in Thailand | 5.95 (1) [5.82, 6.06] | 88.7 | moderately high |
| 3. Possibility to combine medical treatments with tourism activities | 5.90 (1) [5.77, 6.02] | 87.3 | moderately high |
| 4. Thailand has reputation as an international medical hub | 5.82 (4) [5.69, 5.94] | 86.3 | moderately high |
| 5. Travel from country of residence is cheap and convenient | 5.54 (5) [5.41, 5.71] | 78.4 | moderately high |
| 6. Similar culture | 3.08 (6) [2.89, 3.27] | 21.9 | slightly low |

Note: Less than 1.87 = lowest, 1.87-2.71 = moderately low, 2.72-3.57 = slightly low, 3.58-4.43 = neutral, 4.44-5.29 = slightly high, 5.30-6.14 = moderately high, more than 6.14 = Highest.

Number in () is the ranking that testing by t-test (with bootstrap). Difference are statistical significant at 0.05 level.

Number in [] is the bootstrap confidence interval mean at the statistical confidence level of 95 percent.

Source: Survey in April-August, 2013.

This result is consistent with the information of Table 2.5 in which low cost of treatments was the main reason for choosing Thailand as the medical tourism destination. In 2016, the prices of medical treatments in Thailand such as breast implants were more than two times cheaper than in Singapore (<http://medicaltourism.com>)¹³. Moreover, hotel prices and traveling cost in Thailand were cheaper when compare with other medical tourism destinations in Asia. In 2015, hotel price index of Thailand was about two times cheaper than in Singapore (World Economic Forum, 2017).

Besides country attributes, medical service (hospital) factors are also likely to influence the choice on medical tourism destinations. Table 2.7 presents the importance of medical service attributes. It shows that capabilities of doctors and effectiveness of treatments were the most important factors that attract the respondents to Thailand.

¹³ medicaltourism.com is the website that managed by the medical tourism association (MTA) to provide the information of medical tourism for patients and industry providers.

Table 2.7: The Importance Giving to Each Item of Medical Services in Thailand

| Importance giving to the item of medical services | Average (Full mark = 7) | Percentage agree | Level |
|---|--------------------------|------------------|-----------------|
| 1. Capabilities of doctors | 6.60 (1) [6.52, 6.67] | 98.4 | highest |
| 2. Effectiveness of treatments | 6.55 (1) [6.47, 6.63] | 97.3 | highest |
| 3. Quality of the services | 6.49 (3) [6.41, 6.58] | 97.4 | highest |
| 4. Adequate information of medical services | 6.36 (4) [6.26, 6.45] | 95.8 | highest |
| 5. Atmosphere and facilities | 6.31 (4) [6.21, 6.41] | 94.2 | highest |
| 6. Staff communicative skill | 5.93 (6) [5.81, 6.05] | 87.0 | moderately high |

Note: Less than 1.87 = lowest, 1.87-2.71 = moderately low, 2.72-3.57 = slightly low, 3.58-4.43 = neutral, 4.44-5.29 = slightly high, 5.30-6.14 = moderately high, more than 6.14 = Highest.

Number in () is the ranking that testing by t-test (with bootstrap). Difference are statistical significant at 0.05 level.

Number in [] is the bootstrap confidence interval mean at the statistical confidence level of 95 percent.

Source: Survey in April-August, 2013.

b) Characteristics and assessment of the medical services

This part presents the basic trip characteristics of medical tourists, as well as their perception of the treatments.

❖ Characteristics of medical services or on-site experience

Table 2.8 presents the basic characteristics of medical tourism trip such as type of medical services, trip arrangement, duration of stay, and expenditure. The majority of respondents (77.4 percent) received a medical treatment related with beauty such as breast augmentation, eyelid surgery, and face lift (note that 87 percent of the sample was women). 15.7 percent of respondents used health check-up service.

Table 2.8: Behavior during Received Medical Services in Thailand

| Behavior during received medical services | Frequency | Percentage |
|--|-------------------------------|--------------|
| 1. Type of medical services received in this trip | 363 | 100.0 |
| - Beauty | 281 | 77.4 |
| - Health check-up | 57 | 15.7 |
| - Dentistry | 13 | 3.6 |
| - Specialized treatment/serious disease (e.g. stroke, knee surgery) | 12 | 3.3 |
| 2. Tourism activities between this trip | 377 | 100.0 |
| - Travel alone | 93 | 24.7 |
| • <i>No tourism activities</i> | 37 | 39.8 |
| • <i>Undertake tourism activities</i> | 56 | 60.2 |
| - Travel with companion (average 1 person) | 284 | 75.3 |
| • <i>No tourism activities</i> | 41 | 14.4 |
| • <i>Undertake tourism activities</i> | 243 | 85.6 |
| 3. Type of tourism activities | 810* | |
| - Shopping | 279 | 74.0 |
| - Coastal activities | 190 | 50.4 |
| - Spa | 146 | 38.7 |
| - City tour | 132 | 35.0 |
| - Others(e.g. tiger/elephant show, rock climbing, cooking class) | 63 | 16.7 |
| 4. Duration of stay in Thailand depend of treatment result | 71 | 20.1 |
| 5. Average duration of stay in Thailand | 23 days | |
| - The period of medical treatments | 8 days | |
| - The period of tourism | 15 days | |
| 6. Average expense for this trip | US\$ 10,214 per person | |
| 7. Average cost of medical services | US\$ 5,565 per person | |
| 8. The person responsible for cost of medical services in this trip | 383 | 100.0 |
| - The respondents | 347 | 90.6 |
| - The insurance company | 26 | 6.8 |
| - Others (e.g. parent, partner) | 10 | 2.6 |
| 9. Trip arrangement | 368 | 100.0 |
| - Self-arranged | 214 | 58.2 |
| - Package tour (average price US\$ 7,549 per person per trip) | 154 | 41.8 |
| 10. The expenses including in tour package | 296* | |
| - Cost of medical treatment | 99 | 64.3 |
| - Cost of accommodation | 96 | 62.3 |
| - Cost of travel | 95 | 61.7 |
| - Other (e.g. travel insurance) | 7 | 3.9 |

Note: *more than one answer is possible.

Source: Survey in April-August, 2013.

Less than 25 percent of the participants in this survey travel alone, and the average number of accompanying persons were one. For the respondents who travel alone, 60.2 percent of them have done tourism activities. The proportion of accompanied participants who undertook tourism activity is higher (85.6 percent). The tourism activities that respondents undertook were shopping, coastal activities (snorkeling, island trip), and spa. Regarding the average length of stay, it should be noted that questionnaires were done in the hospital, so this refers to planned length of stay. In fact, some respondents did not know the exact length of stay as it depends on the medical treatment results. The average duration of planned stay in Thailand was 23 days, which can be divided into eight days of the medical treatments and 15 days of tourism activities. This (planned) length of stay of medical tourists is higher than in the case of general tourists which was about 10 days in 2013¹⁴ (Tourism Authority of Thailand, 2014).

The average expense for trip was US\$ 10,214 per person, and the average cost of medical treatments was US\$ 5,565 per person. Moreover, the majority of respondents (90.6 percent) have been responsible for their own medical expense. Comparing the average expense (excluding medical cost) of the respondents (US\$ 310 person per day) with the average expense of general tourists in 2013 (US\$ 150 per person per day) (Tourism Authority of Thailand, 2014), we found that the expenditure of medical tourists was about two times higher than general tourists. In order to explain this difference, it should be mentioned that those individuals who engage in medical tourism are probably at the high end distribution of income, so they pay more than general tourists for the accommodation or tourism activities. Moreover, most participants in this study stay in Phuket and Pattaya where the cost of living is higher than in other Thailand's regions.

Regarding the preparation for the trip, 58.2 percent of respondents arranged this trip by themselves while the rest bought a tour package from a travel agency. The average price of a package was US\$ 7,549 per person. Around 64.3 percent of respondents who bought tour package stated that this price included the medical treatments.

¹⁴ The same year with the medical tourists' survey in this study.

This study applied Chi-square analysis to test the relationship between type of medical tourists and trip arrangement as presented in Table 2.9. The null hypothesis of this test was that the type of medical tourist was related with trip arrangement. The result of the hypothesis testing shown in the last row of Table 2.9 revealed that we could reject the null hypothesis at the statistical significant level 0.05 ($\chi^2 = 21.6$, p-value < 0.05) or in other words, each type of medical tourists had different trip arrangement. Most holidaying and opportunistic medical tourists (100.0 and 89.7 percent respectively) who had the main purpose to visit Thailand mostly (or completely) for tourism arranged the trip by themselves. On the other hand, respondents who came to Thailand equally (or completely) for medical treatments (dedicated and hesitant medical tourists) had a similar proportion of self-arranged trip and tour package.

Table 2.9: Medical Tourists Group and Trip Arrangement

| Medical tourists group | Self-arranged | Package tour | Total |
|---|----------------|----------------|----------------|
| Dedicated (n) | 153 | 133 | 286 |
| (% by rows) | (53.5%) | (56.5%) | (100.0) |
| [% by column] | [74.6] | [89.4] | [81.0] |
| Holidaying (n) | 10 | - | 10 |
| (% by rows) | (100.0%) | - | (100.0) |
| [% by column] | [4.9] | [2.8] | [2.8] |
| Hesitant (n) | 16 | 12 | 28 |
| (% by rows) | (57.1%) | (42.9%) | (100.0) |
| [% by column] | [7.8] | [8.1] | [7.9] |
| Opportunistic (n) | 26 | 3 | 29 |
| (% by rows) | (89.7%) | (10.3%) | (100.0) |
| [% by column] | [12.7] | [2.0] | [8.2] |
| Total (n) | 205 | 148 | |
| (% by rows) | (58.1%) | (41.9%) | n = 353 |
| [% by column] | [100.0] | [100.0] | |
| Pearson Chi-square = 21.6 (d.f. = 3; p-value = 0.00) | | | |

Source: Author calculation.

❖ *Assessment of medical services in Thailand*

This part presents the assessment of medical services in Thailand. As before, respondents were asked to use a seven-point scale (1 = lowest, and 7 = highest) to rank their satisfaction with different elements of medical tourism product, perceived value, and overall satisfaction. Each of these assessments is presented below.

- *Satisfaction with each attribute of medical services*

Table 2.10 presents the satisfaction that respondents received from medical services in Thailand. More than 90 percent of the respondents report a very high satisfaction level with capabilities of doctors, effectiveness of treatments, quality of the services, and adequate information. The staff language skills received a moderately high satisfaction level (average satisfaction value = 5.70).

Table 2.10: The Satisfaction Received from Medical Services in Thailand

| Satisfaction received from medical services | Average (Full mark = 7) | Percentage satisfied | Level |
|---|----------------------------|-------------------------|-----------------|
| 1. Capabilities of doctors | 6.50 (1) [6.41, 6.58] | 97.2 | highest |
| 2. Effectiveness of treatments | 6.44 (2) [6.34, 6.52] | 96.6 | highest |
| 3. Quality of the services | 6.39 (2) [6.30, 6.48] | 96.4 | highest |
| 4. Adequate information of medical services | 6.25 (4) [6.14, 6.35] | 93.6 | highest |
| 5. Atmosphere and facilities | 6.23 (4) [6.11, 6.34] | 89.9 | highest |
| 6. Staff communicative skill | 5.70 (6) [5.56, 5.86] | 81.8 | moderately high |

Note: Less than 1.87 = lowest, 1.87-2.71 = moderately low, 2.72-3.57 = slightly low, 3.58-4.43 = neutral, 4.44-5.29 = slightly high, 5.30-6.14 = moderately high, more than 6.14 = Highest.

Number in () is the ranking that testing by t-test (with bootstrap). Difference are statistical significant at 0.05 level.

Number in [] is the bootstrap confidence interval mean at the statistical confidence level of 95 percent.

Source: Survey in April-August, 2013.

- *Perceived value and overall satisfaction with medical services*

Table 2.11 shows that more than 90 percent of respondents considered that their experience in Thailand was a worthwhile expenditure of both time and money. Moreover, they agree that choosing Thailand to receive medical services allow them to combine tourism activities with medical treatments in the same trip.

94.9 percent of respondents had a very high overall satisfaction level, and 91.7 percent of respondents indicated that their satisfaction was above their expectations.

Table 2.11: Perceived Value and Overall Satisfaction Received from Medical Services in Thailand

| Perceived value and overall satisfaction | Average (Full mark = 7) | Percentage agree | Level |
|---|----------------------------|------------------|-----------------|
| 1. Perceived value | | | |
| - Good use of time | 6.17 (1) [6.05, 6.28] | 93.4 | highest |
| - Worthwhile with money | 6.16 (1) [6.05, 6.27] | 92.6 | highest |
| - Good opportunities to combine medical services with tourism activities in the same trip | 6.05 (3) [5.93, 6.16] | 90.1 | moderately high |
| 2. Overall satisfaction | | | |
| - In Overall, I am satisfied | 6.38 (1) [6.27, 6.46] | 94.9 | highest |
| - Satisfied than expected | 6.11 (2) [6.01, 6.25] | 91.7 | moderately high |
| - Service-oriented staff in Thailand was beyond the expectation | 6.10 (2) [5.99, 6.21] | 90.9 | moderately high |
| - Satisfied with medical services in Thailand than in my home country | 5.90 (4) [5.77, 6.03] | 87.2 | moderately high |

Note: Less than 1.87 = lowest, 1.87-2.71 = moderately low, 2.72-3.57 = slightly low, 3.58-4.43 = neutral, 4.44-5.29 = slightly high, 5.30-6.14 = moderately high, more than 6.14 = Highest.

Number in () is the ranking that testing by t-test (with bootstrap). Difference are statistical significant at 0.05 level.

Number in [] is the bootstrap confidence interval mean at the statistical confidence level of 95 percent.

Source: Survey in April-August, 2013.

c) Future behavior intention

Table 2.12 summarizes the respondents' future behavior intention. The result showed that most of them had a positive future behavior intention in relation with medical services in Thailand. 95.2 percent would recommend medical services in Thailand to their friends and relatives, and 94.7 percent answered that they would recommend members of their family to go to Thailand, if they need medical services. As it was discussed in section 2.2.2a) (page 39) regarding the source of information influencing the decision to go to Thailand, we found that the information from friends or relatives was the main source of information. Then, if private hospitals can provide high levels of satisfaction to current medical tourists so that they recommend Thailand as medical tourism destination, these is likely to have a positive effect on the demand for medical tourism in the future.

Table 2.12: Future Behavior Intention after Using Medical Services in Thailand

| Behavior intention | Average (Full mark = 7) | Percentage agree | Level |
|---|----------------------------|---------------------|-----------------|
| 1. Recommend medical services in Thailand to friends and relatives | 6.32 (1) [6.21, 6.41] | 95.2 | highest |
| 2. If some members in my family needed medical service, I will recommend them to go to Thailand | 6.27 (1) [6.16, 6.37] | 94.7 | highest |
| 3. Would like to come back to Thailand if I need to receive medical services | 6.11 (3) [6.01, 6.23] | 91.5 | moderately high |

Note: Less than 1.87 = lowest, 1.87-2.71 = moderately low, 2.72-3.57 = slightly low, 3.58-4.43 = neutral, 4.44-5.29 = slightly high, 5.30-6.14 = moderately high, more than 6.14 = Highest.

Number in () is the ranking that testing by t-test (with bootstrap). Difference are statistical significant at 0.05 level.

Number in [] is the bootstrap confidence interval mean at the statistical confidence level of 95 percent.

Source: Survey in April-August, 2013.

For the respondents who report a willing to revisit Thailand for medical services, 50 percent would like to receive beauty surgery such as rhinoplasty, face lift, and tummy tuck, and 45.7 percent would like to undergo dentistry (Table 2.13).

Table 2.13: Type of Medical Services would like to Receive in the Future

| Type of medical services | Frequency | Percentage |
|--|------------|--------------|
| 1. Beauty | 173 | 50.0 |
| 2. Dentistry | 158 | 45.7 |
| 3. Special treatment/serious disease (e.g. ear, nose, throat (ENT), Lasik) | 15 | 4.3 |
| Total | 346 | 100.0 |

Source: Survey in April-August, 2013.

2.3 Medical Tourism Trend in Thailand

Table 2.14 presents some figures of the evolution of foreign patients in Thailand and the revenue they generated provided by the report of the Department of Export Promotion, Ministry of Commerce (2013) and the Department of Health Service Support, Ministry of Public Health of Thailand (2016). According to this table, the number of foreign patients increased from 1.7 million in 2009 to 2.6 million in 2015. This represents a 7.1 percent compound annual growth rate (CAGR). While the CAGR of foreign patients' revenue for the same period was around 8.0 percent.

Chapter IV will present the results from the in depth-interviews with private providers' administrators in Thailand about the typology of foreign patients. We can anticipate that 8 out of 12 interviewees agreed that the number of medical tourists is about ten percent of the total number of foreign patients. This information is consistent with the Noree, Hanefeld and Smith (2016) that indicated precisely the same ten percent values. Hence, the estimated number of medical tourists is assessed using this proportion. The result of this estimation is presented in column 4 of Table 2.14 [column 4 = 0.10 * column 2].

Table 2.14: The Estimated Revenue and Number of Medical Tourists in Thailand, 2009-2015

| Year | The number of foreign patients* (1,000 person) | The revenue from foreign patients* (million US\$) | The number of medical tourists¹ (1,000 person) | The revenue from medical tourists² (million US\$) |
|-----------------|---|--|--|---|
| 2009 | 1,690 | 3,155.4 | 169 | 1,782.3 |
| 2010 | 1,980 | 3,550.8 | 198 | 2,080.7 |
| 2011 | 2,240 | 3,838.2 | 224 | 2,307.4 |
| 2012 | 2,530 | 3,914.4 | 253 | 2,594.1 |
| 2013 | 2,500 | 4,700.0 | 250 | 2,553.6 |
| 2014 | 2,350 | 3,294.3 | 235 | 2,405.0 |
| 2015 | 2,550 | 5,000.4 | 255 | 2,620.8 |
| CAGR (%) | 7.1 | 8.0 | 7.1 | 6.6 |

Note: CAGR is compound annual growth rate.

¹ Estimated from the market share of medical tourists which is about 10 percent of total foreign patients.

² Estimated from the number of medical tourists multiplied by average expenditure of medical tourists (medical expenditure + tourism expenditure) obtained from the survey which is about US\$ 10,214 per person per trip and already adjust for the inflation with the consumer price index (CPI) in each year (2013 is the base year).

Source: *Department of Export Promotion, Ministry of Commerce (2013) and Department of Health Service Support, Ministry of Public Health, Thailand (2016).

After we get the estimated number of medical tourists, an approximation to the estimated revenue that they generate can be obtained by multiplying the number of medical tourists with the average expenditure per tourist reported in Table 2.8 (US\$ 10,214 per person). This expenditure was adjusted for inflation with consumer price index (CPI) in each year (2013 is the base year). Hence, column 5 of Table 2.14 presents an estimate of the revenue obtained from medical tourists in Thailand for the period 2009-2015 [column 5 = column 4 * (10,214/CPI)].

Table 2.14 shows the estimated market size of medical tourism in Thailand in the past. However, the relevant information would be provided to forecast the number of medical tourists in the future. This information will be beneficial for both public and private sector entities which need to plan policies and infrastructures, and prepare the supply to accommodate future arrivals. However, the limitation of medical tourist data in Thailand, and in fact in many other cases, is a huge limitation for those forecasting efforts. Official agencies only provide yearly foreign patients data, and the time series are very short (less than 10 years). With this constrains in mind, this study uses foreign patient data to develop a forecasting model with three different techniques, explained in the following section. Then, the most accurate forecasting will be chosen to predict the number of foreign patients in Thailand for the period 2017-2020. After that we will use the estimated proportion of medical tourists (10 percent of foreign patients) to forecast the number of medical tourists.

2.3.1 The forecasting methods

This study uses seven years (2009-2015) data of foreign patients. The data for 2009-2012 was reported by the Department of Export Promotion, Ministry of Commerce (2013) while the data in 2013-2015 was obtained from the Department of Health Service Support, Ministry of Public Health (2016).

This study applied and compared three kinds of forecasting methods that can be applied with very short samples:

- 1) *The Naïve 1 method*: It is a basic forecasting method assuming that this period's value (\hat{x}_t) is the same as the previous period (x_{t-1}) [$\hat{x}_t = x_{t-1}$] (Frechtling, 2001).
- 2) *The linear time trend*: It is one of the easiest and most popular forecasting methods (Frechtling, 2001). The model is $\hat{x}_t = \alpha + \beta t + \varepsilon_t$. Where, α and β are estimated by ordinary least square (OLS).

3) *Grey Model*: The grey model (GM) is the core forms of grey system theory (Deng, 1989; Lui and Forrest, 2007). GM(m,n) denotes a grey model, where m is the order of the differential equation and n is the number of variables. Although various types of grey models can be mentioned, the GM(1,1), named as ‘Grey Model First Order One Variable’ (Kayacan, Ulutas and Kaynak, 2010) is one of the most frequently used in previous forecasting studies (Lin, Lee and Huang, 2009; Kayacan, Ulutas and Kaynak, 2010; Huang, 2012; Intharathirat et al., 2015). That is because GM(1,1) is easier to calculate, and provides higher accuracy than conventional time series analyses or artificial neural network (ANN) (Pai, Chiou and Wen, 2008; Kayacan, Ulutas and Kaynak, 2010; Huang, 2012; Intharathirat et al., 2015). Grey model has been applied in forecasting when there is a need to generate forecasts with very few observations about the past behavior of a variable (only four observations are sufficient (Deng, 1989))

From an observed time series with ‘n’ observations as $x^{(0)} = \{x_1^{(0)}, x_2^{(0)}, \dots, x_n^{(0)}\}$, which has non-negative value; the GM(1,1) can be applied for forecasting following these steps (Deng, 1989; Shih et al., 2011; Huang, 2012; Intharathirat et al., 2015):

Step 1: Define the $x^{(1)}$ that is the accumulated generating operation (AGO) of the observed time series as:

$$x^{(1)} = \{x_1^{(1)}, x_2^{(1)}, \dots, x_n^{(1)}\} \quad (1)$$

where $x_1^{(1)} = x_1^{(0)}$

$$x_k^{(1)} = \sum_{j=1}^k x_j^{(0)}; (k = 2, \dots, n).$$

Step 2: Estimate the value of the developing coefficient and grey input.

The GM(1,1) model is a first-order ordinary linear differential equation as (Deng, 1989; Liu and Forrest, 2007):

$$\frac{dx_k^{(1)}}{dk} + ax_k^{(1)} = b \quad (2)$$

However, we cannot estimate directly the two coefficients ('a' and 'b') in equation (2), owing to its continuous characteristic. Hence, the value of 'a' and 'b' should be estimated by the grey definition formula (Deng, 1989), which is:

$$x_k^{(0)} + az_k^{(1)} = b \quad (3)$$

where 'a' and 'b' are the coefficients.

In grey system theory term, 'a' is said to be a developing coefficient, and 'b' is the grey input. $x_k^{(0)}$ is a grey derivative which maximizes the information density for a given time series to be modelled (Deng, 1989). While $z_k^{(1)}$ is called the background value of the observation number 'k', defined as (Deng, 1989; Shih et al., 2011):

$$z_k^{(1)} = \alpha x_k^{(1)} + (1-\alpha)x_{k-1}^{(1)} \quad (4)$$

α can take values between [0,1]. If α is close to 0 (zero), it means that the old data is more important to the system. Conversely, if α is close to 1, the latest data is very important. The GM(1,1) model fixes $\alpha = 0.5$. But in the GM(1,1)-Alpha model, α is not fixed and its value will be estimated obtain the most accurate forecasting result (Huang, 2012; Intharathirat et al., 2015).

From equation (3), we can use least-square method to obtain the value of 'a' and 'b' (Deng, 1989; Liu and Forrest, 2007):

$$[\hat{a}, \hat{b}]' = (B'B)^{-1} B'X_n \quad (5)$$

where:

$$B = \begin{bmatrix} -z_2^{(1)} & 1 \\ -z_3^{(1)} & 1 \\ \dots & \dots \\ -z_n^{(1)} & 1 \end{bmatrix} \quad \text{and} \quad X_n = [x_2^{(0)}, x_3^{(0)}, \dots, x_n^{(0)}]$$

Step 3: Define the grey differential equation and one-step-ahead time series' prediction.

After obtaining the ‘ \hat{a} ’ and ‘ \hat{b} ’, the grey differential equation can be defined in terms of a differential equation’s discrete solution (Deng, 1989; Liu and Forrest, 2007):

$$\hat{x}_k^{(1)} = \left(x_1^{(0)} - \frac{\hat{b}}{\hat{a}} \right) e^{-\hat{a}(k-1)} + \frac{\hat{b}}{\hat{a}} \quad (6)$$

And $\hat{x}_k^{(1)}$ can be used for forecasting. Then, the predicted time series is calculated following the formula:

$$\hat{x}_1^{(0)} = \hat{x}_1^{(1)} \quad \text{and} \quad \hat{x}_k^{(0)} = \hat{x}_k^{(1)} - \hat{x}_{k-1}^{(1)} ; k = 2, \dots, n \quad (7)$$

When different forecasting methods are used, there are three statistics frequently used to choose the best one methodology: mean absolute error (MAE), mean absolute percentage error (MAPE), and root mean square error (RMSE) (Kim and Moosa, 2005; Li, Song and Witt, 2005; Song and Li, 2008). This study used all three to test forecasting accuracy. The formulas used in computing the MAE, MAPE and RMSE are presented as followed:

$$\text{MAE} = \frac{\sum_{t=1}^n |x_t - \hat{x}_t|}{n},$$

$$\text{MAPE} = \frac{\sum_{t=1}^n \left| \frac{x_t - \hat{x}_t}{x_t} \right|}{n} \times 100,$$

$$\text{RMSE} = \sqrt{\frac{\sum_{t=1}^n (x_t - \hat{x}_t)^2}{n}}$$

MAPE is usually suggested as the critical statistic (Huang, 2012; Xu et al., 2013; Untong et al., 2015; Intharathirat et al., 2015). That is because its evaluation is based on the error estimation, and it is expressed in an easy generic percentage term (Emang et al.,

2010). Moreover, RMSE is more sensitive to outliers than MAPE. This study uses Lewis (1982) criteria of MAPE for model evaluation, which considers less than 10 percent as highly accurate forecasting, 10-20 percent as good forecasting, 20-50 percent as reasonable and more than 50 percent as inaccurate (Chen, Bloomfield and Cabbage, 2008; Untong et al., 2015).

2.3.2 Result of the forecasting

Table 2.15 presents the result of the accuracy test of foreign patients' forecasting in Thailand comparing Naïve 1, linear time trend, GM(1,1), and GM(1,1)-Alpha. The last row applies Lewis (1982) criteria to conclude that linear time trend, GM(1,1), and GM(1,1)-Alpha have excellence forecasting power. The most accurate model would be the one with lower E (%) defined as: $[(\text{true value} - \text{forecast value})/\text{true value}] * 100$. The findings show that the GM(1,1)-Alpha model ($\alpha=0.8$) has the least MAE and MAPE statistic values (139.5 and 6.2 respectively), while the maximum and minimum values of residual error of this model are 13.0% and 0.0% respectively. Moreover, GM(1,1)-Alpha model has the highest number of years with the lowest residual error (three in seven years). Then, the remaining of the section uses GM(1,1)-Alpha model as the forecasting methodology.

Table 2.15: Accuracy Test of Number of Foreign Patients Forecasting

Unit: 1,000 person

| Model | | Naïve 1 | | Linear time trend | | GM(1,1) | | GM(1,1)-Alpha | |
|--------------------------|------------|----------------|------------|-------------------|------------|------------------|-------------|------------------|------------|
| Alpha (α) | True value | - | | - | | [Alpha=0.5] | | [Alpha=0.8] | |
| Year | | Forecast value | E (%) | Forecast value | E (%) | Forecast value | E (%) | Forecast value | E (%) |
| 2009 | 1,690 | 1,380 | 18.3 | 1,755 | 3.9 | 1,916 | 13.4 | 1,878 | 11.1 |
| 2010 | 1,980 | 1,690 | 14.7 | 1,914 | 3.3 | 2,022 | 2.1 | 1,980 | 0.0 |
| 2011 | 2,240 | 1,980 | 11.6 | 2,073 | 7.5 | 2,133 | 4.8 | 2,088 | 6.8 |
| 2012 | 2,530 | 2,240 | 11.5 | 2,232 | 11.8 | 2,251 | 11.0 | 2,202 | 13.0 |
| 2013 | 2,500 | 2,530 | 1.2 | 2,391 | 4.4 | 2,375 | 5.0 | 2,322 | 7.1 |
| 2014 | 2,350 | 2,500 | 6.4 | 2,550 | 8.5 | 2,506 | 6.6 | 2,449 | 4.2 |
| 2015 | 2,550 | 2,350 | 7.8 | 2,708 | 6.2 | 2,644 | 3.7 | 2,582 | 1.3 |
| RMSE | | 237.6 | | 169.9 | | 165.2 | | 172.6 | |
| MAE | | 218.6 | | 151.9 | | 147.0 | | 139.5 | |
| MAPE (%) | | 10.2 | | 6.5 | | 6.7 | | 6.2 | |
| Forecasting power | | Good | | Excellent | | Excellent | | Excellent | |

Note: E (%) is $[(\text{true value} - \text{forecast value})/\text{true value}] * 100$.

The bold highlight presents the minimum and maximum value.

Source: Author calculation.

The steps to forecast the number of medical tourists in Thailand during 2017-2020 are:

- 1) Forecast the number of foreign patients in Thailand during 2017-2020 with GM(1,1)-Alpha. The results are shown in column 2 of Table 2.16.
- 2) Estimate the number of medical tourists by multiplying the number of foreign patients with the proportion of medical tourists from the total foreign patients (10 percent). The result is shown in column 3 of Table 2.16.

Table 2.16: The Estimated Number of Medical Tourists in Thailand, 2017-2020

| Year | The number of foreign patients (1,000 person) | The number of medical tourists ¹ (1,000 person) |
|------|--|---|
| 2017 | 2,871 | 287 |
| 2018 | 3,028 | 303 |
| 2019 | 3,194 | 319 |
| 2020 | 3,368 | 337 |

Note: ¹The number of medical tourists is calculated by multiplying the number of foreign patients with the proportion of medical tourists from total foreign patients (10%).

Source: Author calculation.

Figure 2.1 presents the forecasted medical tourists' trend in Thailand. This figure shows both the time trend (which is the upper bound of the forecasting) and GM(1,1)-Alpha, the lower bound of the forecasting. Medical tourists are expected to grow until 2020, after a decline during 2012-2014. The negative trend on that latter period can be explained due to the massive floods in Bangkok in October and November, 2011 combined with the political unrest during 2012-2014.

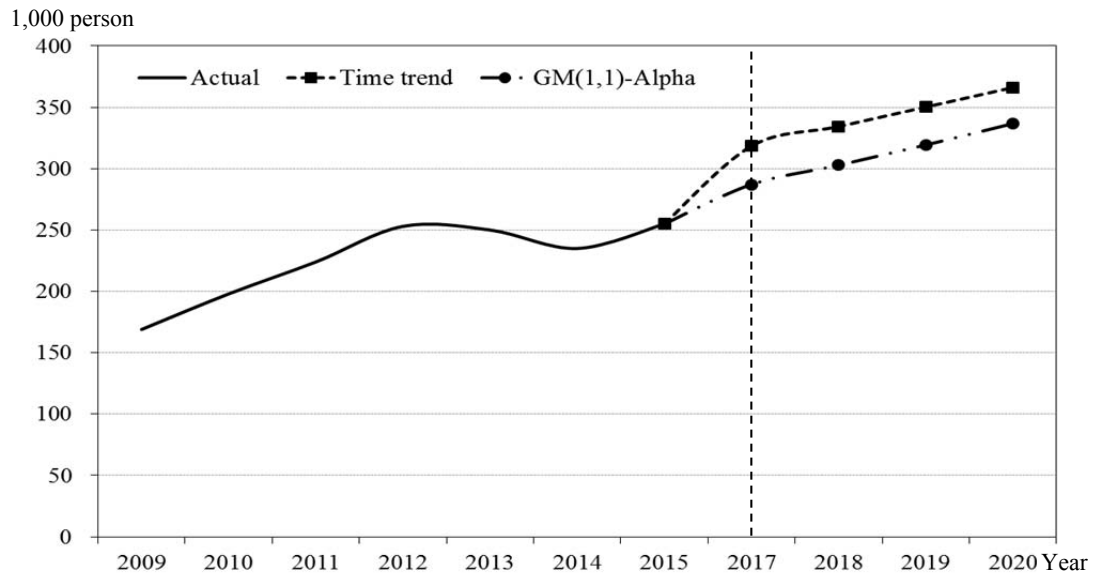


Figure 2.1: Trend of the Number of Medical Tourists, 2017-2020

2.4 Conclusions

This chapter attempted to extend the comprehension and provide information about the demand of medical tourism in Thailand. The analysis is separated into two parts. The first part describes medical tourists' characteristics in Thailand, which is divided into three stages: decision-making, on-site behavior, and future behavior intention. The second part forecasts the market size of medical tourism. The findings from this study will be important to set the strategy on investment and resource allocation to accommodate the expansion of medical tourism market in the future.

Sources of information of this study consisted of primary data obtained from the interviews with medical tourists from five private hospitals. As well as secondary data from the relevant agencies in Thailand as the Department of Export Promotion, Ministry of Commerce Thailand, and the Department of Health Service Support, Ministry of Public Health Thailand, to forecast the trend of the number of medical tourists.

The results obtained from the questionnaire showed that the majority of medical tourists in the sample (87.2 percent) were female, and their average age was 32 years old. Most of the respondents were Australian (69.6 percent) followed by Russian and New Zealand respectively. Regarding the medical tourism experience of respondents, we found that most of the respondents decided to receive medical services in Thailand

before departing from their home country and only 20 percent had visited Thailand before for medical reasons. Most respondents stated that reasonable price of treatments and cost of living, including the quality of medical services, were the main reason to choose Thailand as destination. Friends and relatives were an important source of information for choosing the medical tourism destination, while medical travel agency was the channel that most of the respondents used to contact with the hospital. Moreover, half of the respondents would like to go to Singapore if they did not decide to go to Thailand.

The interesting finding is that for those who identified medical treatments as the main purpose of their trip tended to make the decision to receive treatments before departing from their home country, whereas those who traveled mostly (or completely) for holiday reasons were likely to decide to get medical services after arriving Thailand.

The most frequent medical treatment (77.4 percent) was beauty services. The (planned) average duration of stay in Thailand was 23 days, eight days for medical service and 15 days for other tourism activities such as shopping, coastal activities, and sightseeing. The average expenditure was US\$ 10,214 per person. The average medical service fee was US\$ 5,565 per person. Over 90 percent of respondents were responsible for their own medical expenses.

Respondents perceived that medical service in Thailand was worthwhile with money and time, and in overall they were satisfied with these services. Moreover, they will recommend these medical services to their friends and relatives, including suggesting the members of their family to go to Thailand if they need medical services.

The second part of the chapter deals with forecasting future tourism demand. However, that topic is challenging given the limited historical data on medical tourists. Most forecasting techniques as time-series analysis, artificial neural network, or econometrics need sufficient data to develop accurate estimates. Then, this study used the grey model, which can be applied with limited historical data, to forecast the number of medical tourists in Thailand during 2017-2020. The results from this study found that grey forecasting model (GM(1,1)-Alpha) is more accurate in forecasting than Naïve 1, linear time trend and grey model with fixed alpha (GM(1,1)). That is because it has the lowest value of MAE and MAPE.

The results of the forecasting of number of foreign patients with the GM (1,1) -Alpha model found that by 2020, there would be approximately 3.4 million foreign patients in Thailand (a yearly 5.7 percent growth from 2015). If the current 10% ratio is maintained, 337,000 of them would be medical tourists. The results indicate that medical tourism demand in Thailand is still growing rapidly. Therefore, the government and medical tourism providers should prepare the local medical infrastructures to accommodate the expansion of medical tourism in the future.

2.5 References

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Chapter III

Motivation, Experiences and Future Behavior Intention of Medical Tourists in Thailand

The main objective of this chapter is to understand the structure of medical tourists' behavior in Thailand through the analysis of the causal relationship between motivation, on-site experience, and future behavior intention. This objective is approached within two conceptual frameworks. The first model presents the causal relationship between experiences and tourists' future behavior intention. In this sense, this is a partial approach that replicates many previous studies of tourists' behavior (Baker and Crompton, 2000; Petrick and Backman, 2002; Petrick, 2004). The second model adopts a more general perspective, and investigates the magnitude of the influence of country motivation and hospital motivation on experiences and future behavior intention. The reason for this latter proposal is that during the in-depth interviews with the administrators of major private providers in Thailand (described in Chapter I), they indicated that country and hospital characteristics were the two main factors that attracted medical tourists. Then, it is interesting to study the magnitude of the influence of these two motivations on the following steps of the tourism experience.

Modelling the relationship between motivation, experiences, intermediary constructs (such as perceived value and satisfaction), and post-visitation behavior intention will provide an understanding of the causal relationship among these variables. Moreover, the estimated coefficients can be used to rank the country's attributes that attract medical tourists to Thailand. Hence, appropriate tourism policies can be designed to enhance the competitiveness of the medical tourism industry in Thailand. Likewise, private medical tourism providers can use this information to improve their services to meet tourists' need, and achieve positive future behaviors (willingness to repeat and recommend).

3.1 Introduction

There are several push factors that motivate people to receive medical services abroad, whether expensive medical costs, unavailable medical procedures, or long

waiting lists at a home country (Connell, 2006; 2013; Mechinda et al., 2010). While reputation and capability of doctors, quality of the medical services, and the attractiveness as tourism destination are pull factors that might influence the decision to select a given country and hospital (Connell, 2006; Ramirez de Arellano, 2007). Nevertheless, as will be discussed in more detail in Chapter IV, there is a close relation between those categories, as some push factors in the origin country will be pull factors of the selected medical tourism destination. For instance, an expensive treatment at home country is a push factor and a cheap treatment at destination is a pull factor.

This thesis proposes that the relevant issue to explain the decision to travel abroad to receive medical tourism is the presence of a gap between origin and destination. The potential patients' choice can be further divided into two decisions:

- First, the choice of the medical tourism destination, in which the relevant attributes are factors as: country's reputation as a medical center, tourist destination attractiveness, reasonable cost of living, etc.
- Second, the choice of hospital is considered to be based on attributes such as service quality, doctors' capability, or the effectiveness of treatments.

After their stay at the destination, if tourists obtained good experiences, they will be satisfied, and that leads to good future behavior intention such revisit or positive word of mouth (WOM). The positive future behavior intention is one of the indicators of business success (Chen and Tsai, 2007), especially in the service industry where reputation and customer satisfaction are important factors for the sustainable growth.

There are many previous studies that analyzed the factors affecting customer future behavior intention, especially loyalty (Cronin, Brady and Hult, 2000; Yoon and Uysal, 2005; Chen and Chen, 2010; Žabkar, Brenčič and Dmitrović, 2010). These studies usually found a causal relationship between customers' pre-service behavior, on-site experience, post-service behavior, and future behavior intention. Other studies indicated that motivation is an important factor influencing the decision-making process, during-services, post-service, and future behavior intention (Yoon and Uysal, 2005; Huang, Shen and Choi, 2015; Wang and Leou, 2015; Lim, Kim and Lee, 2016).

Based on the above analyses, the causal relationship of the medical tourists' behaviors and its impact on the future behavior intention is presented with two models:

1) *A partial model* which analyzes the causal relationship between experiences and future behavior intention of medical tourists in Thailand. This kind of model is found in many general studies on the behavior of tourists (Baker and Crompton, 2000; Petrick and Backman, 2002; Petrick, 2004). Regarding the specific case of medical tourism, there are several papers (Han and Hyun, 2015; Manaf et al., 2015; Shahijan et al., 2015; Rahman and Zailani, 2016) that analyzed the causal relationship between experiences and future behavior intention (as shown in Table 3.1). But, as far as this PhD candidate is aware, there is no study about medical tourism in Thailand. Then, in this study, we applied this partial model with the empirical data of the behavior of medical tourists in Thailand.

Table 3.1: Main Studies on the Causal Relationship of Medical Tourists' Behavior

| Author | Method | DI → SE/ST | SE → ST/BI | ST → BI |
|---------------------------|------------|------------|------------|---------|
| Han and Hyun (2015) | SEM (MLE) | - | ✓ | ✓ |
| Manaf et al. (2015) | Regression | - | ✓ | - |
| Shahijan et al. (2015) | SEM (PLS) | ✓ | ✓ | ✓ |
| Rahman and Zailani (2016) | SEM (PLS) | - | ✓ | ✓ |

Note: SEM is structural equation model, MLE is maximum likelihood estimation, and PLS is partial least square.

DI is destination image, SE is service experience including service quality and perceived value, ST is satisfaction, and BI is future behavior intention.

This study will provide an assessment of medical service experience's effect on perceived value, satisfaction, and future behavior intention. Understanding the relevant aspects that determine customer's behavior intention is important for private providers, so they can improve or control their service quality, which will lead to good future behavior intention (revisit or positive WOM).

2) *A complete model* to study the causal relationship between country motivation, hospital motivation, on-site experience, and future behavior intention of medical tourists in Thailand. This model is more inclusive than the partial approach as we incorporated the visitors' motivation. The reason to present this analysis is that several previous studies

emphasized the effect of the motivation on the following stages of the behavior (Yoon and Uysal, 2005; Huang, Shen and Choi, 2015; Wang and Leou, 2015; Lim, Kim and Lee, 2016). As far as this PhD candidate is aware, this is the first attempt to incorporate the role of motivation in a model of medical tourists' behavior. The interviewed administrators of private providers emphasized two types of motivation in the early stages of the patients' choice process: the country aspects, for the selection of destination; and hospital aspects, for the selection of the provider. Then, this study separated both motivations, and tests whether these motivations have different effects on experiences and future behavior intention. In order to analyze medical tourists' behavior, and following previous literature, the full experiences have been divided into four stages: decision making, on-site experience, post-service, and future behavior intention (Yoon and Uysal, 2005; Chen and Tsai, 2007; Untong et al., 2011).

The results from this study will present the magnitude of the effects of country and hospital motivation on medical service experience, perceived value, overall satisfaction, and future behavior intention. This assessment might be important for designing the appropriate tourism policies to increase the competitiveness of the medical tourism industry in Thailand. The application can have a microeconomic approach, such as the policy to enhance the ability to compete of private hospitals, or a macroeconomic scale, such as the policy to improve the infrastructure to accommodate visitors.

3.2 Literature Review

This section presents the way in which previous studies have treated the main elements which are included in the models described in section 3.1. In general, tourism motivation can be differentiated into push motivation and pull motivation (Yoon and Uysal, 2005; Uysal, Li and Sirakaya-Turk, 2008), while the evaluation of tourists' experience is captured through service quality assessment, perceived value, and overall satisfaction. Future behavior intention usually refers to the willingness to revisit and recommend these services to friends and relatives (Chen and Tsai, 2007; Chen and Chen, 2010; Untong et al., 2011). In summary, there are five features of interest throughout this study: motivation, service quality, perceived value, overall satisfaction, and future behavior intention. The literature's assessment approach to each of these constructs is described below:

3.2.1 Motivation

Motivation has been referred to as psychological (or biological) needs and wants, including essential forces that stimulate, direct, and integrate a person's behavior (Dann, 1981; Pearce, 1982; Uysal and Hagan, 1993). It is an importance factor stimulating the decision to do tourism (Yoon and Uysal, 2005; Park and Yoon, 2009; Ye, Qiu and Yuen, 2011). Understanding tourists' motivation should be useful to create appropriate methods to increase satisfaction and positive future behavior (Yoon and Uysal, 2005). Abundant previous studies described the motivations to travel or to choose particular tourism activities, like festivals, spa, etc. (Crompton and McKay, 1997; Kamata and Misui, 2015; Rittichainuwat and Rattanaphinanchai, 2015; Lim, Kim and Lee 2016). Both anthropologist and social psychologist believe that the willingness to participate in tourism-related activities is caused by the motivation of searching for escape from everyday life (Yoon and Uysal, 2005; Park and Yoon, 2009).

Most studies divided motivation in push and pull factors (Yoon and Uysal, 2005; Uysal, Li and Sirakaya-Turk, 2008). Push motivations are those factors which encourage people to travel somewhere. In medical tourism, some of these push factors are cost, availability of treatments and advanced technology. Pull motivations are those factors influencing the decision to select destinations. For medical tourism, these pull factors are usually related with facilities at destination, safety, friendliness, competence, and reputation of the hospitals (Cormany, 2010; Altin, Singal and Kara, 2011). As had already been said, any of those elements will be relevant when there is a gap between origin and destination that justify traveling abroad to visit a hospital.

Smith and Forgione (2007) argued that country-specific characteristics, such as economic conditions, political climate, and regulatory policies, influence destination's choice. Other factors such as costs, hospital accreditation, quality of care, and physician training have an impact on the choice of healthcare facilities. According to their two-stage model, medical tourists first select a destination and then consider the medical/tourism facilities or infrastructure in that destination.

For the specific case of Thailand, this PhD proposes to divide the pull factor into country and hospital motivations. In the former group we should include:

reasonable price of treatments, convenient and cheap cost of travel from the origin country, reasonable cost of living, and the possibility of combining the treatment with tourism activities. On the other hand, hospital motivation comprises: quality of the services, capabilities of doctors, effectiveness of treatments, atmosphere and facilities, and adequate information of medical services.

3.2.2 Service quality

Service quality evaluation is the assessment of customer satisfaction with the different elements of the service (Juga, Juntunen and Grant, 2010; Abbas, Ghaleb and El-reface, 2012).

Parasuraman, Zeithaml and Berry (1988) presented the 'SERVQUAL' method for assessing service quality by classifying the quality of service received in five parts: reliability, responsibility, assurance, empathy, and tangibles. The evaluation is based on the comparison between the expectation of customers (what they want) and the real perception of them (what they get). If service is provided with a quality equal or above the expectation, clients will be satisfied (Parasuraman, Zeithaml and Berry, 1988; 1994). However, there are some 'SERVQUAL' critiques. For example, it is based on a disconfirmation paradigm rather than an attitudinal paradigm, and it focuses on the service delivery process, not on the outcome (Buttle, 1996). Later, Cronin and Taylor (1992) proposed a performance evaluation model (SERVPERF), which assesses service quality considering only the perception of service performance without taking into account customers' expectation. Several previous studies indicate that performance measurement (SERVPERF) has advantages over the comparison between the expectation and real perception (SERVQUAL) for empirical applications (Jain and Gupta, 2004; Abbas, Ghaleb and El-reface, 2012). They found that the dominant contributor to the gap score (perception – expectation) was the perception score and there is a tendency to rate expectations high. Then, SERVPERF provides a more convergent and discriminant valid explanation of the service quality construct (Jain and Gupta, 2004).

Given that previous literature emphasizes the advantages of service quality assessment through performance measurement, this is the approach adopted in this PhD thesis. The measurement of hospitals' performance is divided into five parts:

quality of the services, capabilities of doctors, effectiveness of treatments, atmosphere and facilities, and adequate information.

3.2.3 *Perceived value*

Zeithaml (1988) defined perceived value as the relative customer's assessment of product's utility, comparing what is received (get) and what is given. The 'get' components refer to the benefits obtained from using the product, while the 'given' components may refer to the customer sacrifice in gaining the product, including monetary and non-monetary aspects as time. Perceived value is subjective; therefore, it may vary depending on the circumstances (Zeithaml, 1988).

The measurements of perceived value can be analyzed using unidimensional or multi-dimensional approaches. The former considers the trade-off between perceived quality and price (or time). While the multi-dimensional approach, like SERV-PERVAL scale, pays attention to five dimensions of perceived value: perceived quality, monetary price, behavioral price, emotional response, and reputation (Petrick and Backman, 2002; Chen and Chen, 2010). Previous studies found that perceived service quality and monetary price are the main features of perceived value, especially for tourism (Duman and Mattila, 2005). This study applied the unidimensional approach to measure the perceived value by dividing it into three aspects: value for money, worthy use of time, and good opportunities to combined medical services with tourism activities in the same trip. This last item has been added in this research as it is a particularity of medical tourism, which combines treatments and tourism.

3.2.4 *Overall satisfaction*

Satisfaction is a main factor that influences tourists' future behavior intention (Chen and Tsai, 2007; Chi and Qu, 2008; Chen and Chen, 2010), and it has been frequently used to reflect service quality (Yoon and Uysal, 2005; Chen and Tsai, 2007; Chi and Qu, 2008). Previous studies measured tourists' satisfaction by applying various conceptual approaches, as comparing satisfaction with cost (Oliver and Swan, 1989) or, more often, comparing the current service with expected standards (Latour and Peat, 1979; Ekinici, Riley and Chen, 2001; Yoon and Uysal, 2005).

As mentioned above, the measurement of customer satisfaction can consider diverse dimensions, or an overall assessment (Yoon and Uysal, 2005; Chi and Qu, 2008; Chen and Chen, 2010).

This study measured overall satisfaction through four dimensions:

- Satisfaction with services.
- Greater satisfaction than expected.
- More satisfied with medical services in Thailand than in their home country.
- The service-oriented attitude of the staff in Thailand was beyond their expectation.

3.2.5 Future behavior intention

Future behavior intention appears after using one or several products like transportation, accommodation, medical services, etc. In general, future behavior intention refers to the willingness to revisit or recommend to others (Chen and Tsai, 2007; Chi and Qu, 2008; Chen and Chen, 2010).

Customer loyalty has been extensively used in the academic literature to assess tourists' future behavior intention (Backman and Crompton, 1991; Pritchard and Howard, 1997; Chen and Tsai, 2007; Chi and Qu, 2008; Chen and Chen, 2010). The so called 'conative loyalty' refers to customer presenting positive feeling toward a product (Oliver, 1999). Hence, this is a behavioral measure which considers statements as willingness to repeat or recommend (Chen and Chen, 2010). For tourism, the degree of destination loyalty is commonly reflected through tourists' intention to revisit the destination, and/or willingness to recommend to others (Chen and Tsai, 2007). According to Reichheld and Sasser (1990), a five percent increase in customer loyalty can improve business profits between twenty-five to ninety-five percent. WOM can be seen as an effective low-cost advertising channel (Shoemaker and Lewis, 1999). In fact, some studies indicate that more than sixty percent of customers base their buying decisions on the information received from acquaintances (Reichheld and Sasser, 1990). Then, loyalty (measured by a willingness to revisit or recommend) can be used as an indicator of marketing strategy success (Yoon and Uysal, 2005; Chi and Qu, 2008).

This study measured future behavior intention of medical tourists through three different intended behaviors:

- Willingness to revisit Thailand to undergo medical services.
- Intend to recommend medical services in Thailand to friends and relatives.
- Intend to suggest family's members to undergo medical services in Thailand.

Some previous studies found that service quality, perceived value, and future behavior intention had causal relationship (Backman and Veldkamp, 1995; Baker and Crompton, 2000; Cronin, Brady and Hult, 2000; Chen and Chen, 2010). Once the coefficients of the model are estimated, we might be able to predict the direction of future tourists' behavior (intention to revisit or recommend) based on the measurement of service quality, perceived value, and satisfaction (Bojanic, 1996; Baker and Crompton, 2000; Cronin, Brady and Hult, 2000; Petrick, 2004; Chen and Chen, 2010; Untong et al. 2011). Similarly, in the complete model, if we know customer's motivation, we will be able to anticipate perceived value, satisfaction, and future behavior intention (Yoon and Uysal, 2005; Severt et al., 2007; Lee and Beeler, 2009).

3.3 Research Methodology

3.3.1 Two conceptual frameworks

As it is described in section 3.1, this chapter proposes a partial approach (common in the literature), and a holistic analysis (which incorporate particular medical tourism motivations). The details of these two conceptual models are described in the following subsections:

a) Model one: experiences and future behavior intention

This model focuses on the causal relationship between experiences and the subsequent behavior intention. After receiving the treatments in Thailand, medical tourists might assess the experience provided by the private hospitals, and this will affect their future behavior intention. The effect might be a direct, or an indirect effect that transmits through the perceived value and overall satisfaction. In this sense,

the model tests the hypothesis that there is a causal relation between the medical service experience, perceived value, overall satisfaction, and future behavior intention. Some previous studies found that service quality and perceived value are the main factors influencing satisfaction and future intention (Lee, Yoon and Lee, 2007; Chen and Chen, 2010; Juga, Juntunen and Grant, 2010; Abbas, Ghaleb and El-reface, 2012). Moreover, overall satisfaction has also been considered as a factor that influences behavior intention (Yoon and Uysal, 2005; Chen and Tsai, 2007; Chi and Qu, 2008; Chen and Chen, 2010).

The conceptual framework of the first model is presented in Figure 3.1.

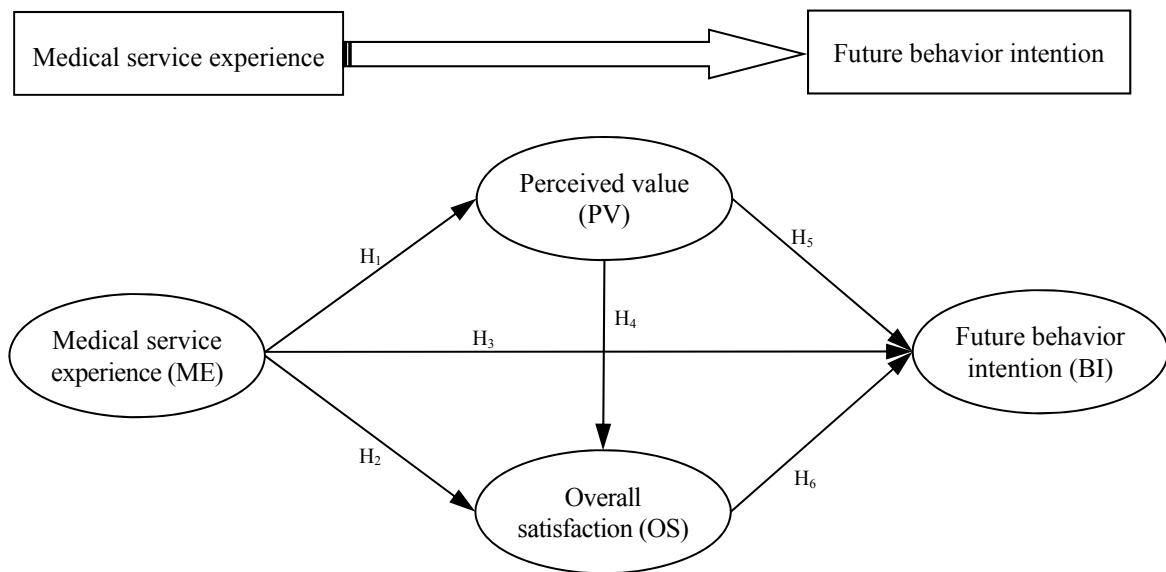


Figure 3.1: Conceptual Model of the Causal Relationship between Experiences and Future Behavior Intention of Medical Tourists in Thailand

From the above conceptual framework, the researcher can set six hypotheses for the testing:

- H₁: Medical service experience has a direct effect on perceived value.
- H₂: Medical service experience has a direct effect on overall satisfaction.
- H₃: Medical service experience has a direct effect on future behavior intention.
- H₄: Perceived value has a direct effect on overall satisfaction.
- H₅: Perceived value has a direct effect on future behavior intention.
- H₆: Overall satisfaction has a direct effect on future behavior intention.

The above hypotheses are tested by applying the structural equation model (SEM) with data collected from the medical tourists' survey described in Chapter I.

b) Model two: motivation, experiences and future behavior intention

This second conceptual approach extends the first proposal by incorporating the role of motivation as suggested by previous studies in tourism (Yoon and Uysal, 2005; Severt et al., 2007; Huang, Shen and Choi, 2015; Wang and Leou, 2015; Lim, Kim and Lee, 2016).

All the participants in the in-depth interviews agreed that most medical tourists decide about the country they prefer before choosing the hospital in which they would like to receive the medical treatments. Then, country motivation will affect hospital motivation. The impact on further variables of the model might be through a direct or an indirect effect.

Some previous studies found that motivation affected service quality assessment, perceived value (Yoon and Uysal, 2005; Severt et al., 2007; Lee and Beeler, 2009), and overall satisfaction (Lee and Beeler, 2009; Huang, Shen and Choi, 2015). Simultaneously, service quality and perceived value are often considered as the main factors influencing tourists' satisfaction and future behavior intention (Chen and Chen, 2010; Juga, Juntunen and Grant, 2010; Abbas, Ghaleb and El-reface, 2012). In fact, overall satisfaction is usually considered the key factor affecting tourists' future behavior intention (Yoon and Uysal, 2005; Chen and Tsai, 2007; Chi and Qu, 2008; Chen and Chen, 2010; Untong et al., 2011).

This second model proposes a causal relation between country motivation, hospital motivation, medical service experience, perceived value, overall satisfaction, and future behavior intention of medical tourists in Thailand as showed in Figure 3.2.

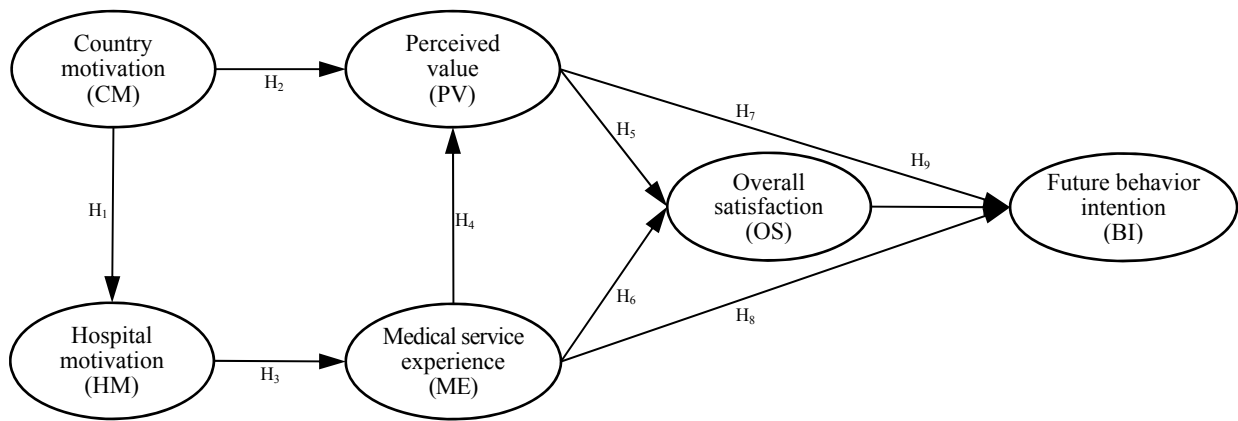


Figure 3.2: Conceptual Model of the Causal Relationship between Motivation, Experiences, and Future Behavior Intention of Medical tourists in Thailand

From the above conceptual framework, the researcher can set nine hypotheses for testing:

- H₁: Country motivation has a direct effect on hospital motivation.
- H₂: Country motivation has a direct effect on perceived value.
- H₃: Hospital motivation has a direct effect on medical service experience.
- H₄: Medical service experience has a direct effect on perceived value.
- H₅: Perceived value has a direct effect on overall satisfaction.
- H₆: Medical service experience has a direct effect on overall satisfaction.
- H₇: Perceived value has a direct effect on future behavior intention.
- H₈: Medical service experience has a direct effect on future behavior intention.
- H₉: Overall satisfaction has a direct effect on future behavior intention.

Structural equation model (SEM) is the methodology used to test the above hypotheses.

3.3.2 Data used in the study

The data used in this study were collected from the medical tourists' questionnaire described in Chapter I. This survey collected 383 observations from

April to August, 2013. However, due to lack of relevant data, the final model estimation was done with 351 observations (92 percent of total records).

The questionnaire consists of 28 items (as shown in appendix B) which include questions about: country motivation (six items), hospital motivation (six items), medical service experience (six items), perceived value (three items), overall satisfaction (four items), and future behavior intention (three items). Each item has a seven-point rating scale (1 = lowest and 7 = highest).

3.3.3 Variables used in the study

Table 3.2 shows all variables used in the study. The first model of the causal relationship between experiences and future behavior intention, present in Figure 3.1, incorporates 15 observable variables (five exogenous variables and ten endogenous variables) and four latent variables. These latent variables are divided into one exogenous variable (medical service experience) and three endogenous variables (perceived value, overall satisfaction, and future behavior intention).

The second model which examines the influence of country motivation and hospital motivation on experiences and future behavior intention (Figure 3.2) consists of 24 observable variables (four exogenous variables and twenty endogenous variables) and six latent variables. These latent variables are divided into one exogenous variable (country motivation) and five endogenous variables (hospital motivation, medical service experience, perceived value, overall satisfaction, and future behavior intention).

It should be noted that although the variables ‘hospital motivation’ (HM) and ‘medical service experience’ (ME) has the same items, the method used by the researcher to ask about both variables is different. For the variable hospital motivation (HM), the inquirer asked tourists about the importance they gave to these items in the decision process. While the variable medical service experience (ME) assessed the post-service satisfaction with the corresponding items.

Table 3.2: Latent and Observable Variables in the Study

| Latent variables | Observable variables |
|---------------------------------|--|
| Country motivation (CM) | Reasonable price of treatments (CM1) Cheap and convenient Travel from country of residence is (CM2) Reasonable cost of stay in Thailand (CM3) Possibility to combine with tourism activities (CM4) |
| Hospital motivation (HM) | Quality of the services (HM 1) Capability of doctors (HM2) Effectiveness of treatments (HM3) Atmosphere and facilities (HM4) Adequate information of medical services (HM5) |
| Medical service experience (ME) | Quality of the services (ME1) Capability of doctors (ME2) Effectiveness of treatments (ME3) Atmosphere and facilities (ME4) Adequate information of medical services (ME5) |
| Perceived value (PV) | Good value for money (PV1) Good use of time (PV2) Good opportunities to combined medical services with tourism activities in the same trip (PV3) |
| Overall satisfaction (OS) | In overall, I am satisfied with the medical services received (OS1) The satisfaction is greater than expected (OS2) The satisfaction with medical services in Thailand is greater than in my home country (OS3) The service-oriented staff in Thailand was beyond the expectation (OS4) |
| Future behavior intention (BI) | Come back to receive medical services in Thailand, if needed (BI1) Recommend medical services in Thailand to friends and relatives (BI2) Recommend members of my family to go to Thailand, if they need medical services (BI3) |

Note: In the questionnaire, medical service experience (ME) consists of six items. However, after consider content validity, the item of ‘staff communicative skill’ is dropped out, because it is not related with medical services. Two additional elements, ‘Thailand has reputation as an international medical hub’ and ‘similar culture’ were dropped as they cannot measure country motivation with statistical reliability.

3.4 Data Analysis and Results

This section is divided into two parts: First, the descriptive statistics of the data and its implications for the estimation process are discussed; The second part presents the coefficients from the SEM.

3.4.1 Data Analysis

The descriptive statistics of the observable variables presented in Table 3.3 show the minimum, maximum mean and standard deviation of all the variables. The last column of the table presents the result of the D'Agostino's univariate normality test (D'Agostino, Belanger and D'Agostino Jr., 1990). The figures in the column are the corresponding p-value. The fact that all cells have zero value indicates a strong null hypothesis rejection of normally distributed data.

The tests of multivariate normality are shown in the last two rows of Table 3.3. Similarly, all p-values equal to zero means that we strongly reject multivariate normal distribution. Then, if maximum likelihood estimation (MLE) was used, the coefficients would be bias and inefficient (Kline, 2010; Muthén and Muthén, 2012). In order to obtain reliability coefficients, this study uses maximum likelihood estimation with robust standard error (MLR) (Muthén and Muthén, 2012).

Table 3.3: Descriptive Statistics and Normality Testing

| Variable name ¹ | Minimum | Maximum | Mean | Standard deviation | p-value of univariate normality test ² |
|----------------------------|---------|---------|------|--------------------|---|
| CM1 | 1 | 7 | 6.05 | 1.15 | 0.00 |
| CM2 | 1 | 7 | 5.60 | 1.41 | 0.00 |
| CM3 | 1 | 7 | 5.98 | 1.10 | 0.00 |
| CM4 | 1 | 7 | 5.91 | 1.20 | 0.00 |
| HM1 | 3 | 7 | 6.52 | 0.71 | 0.00 |
| HM2 | 3 | 7 | 6.63 | 0.65 | 0.00 |
| HM3 | 3 | 7 | 6.59 | 0.68 | 0.00 |
| HM4 | 2 | 7 | 6.34 | 0.89 | 0.00 |
| HM5 | 2 | 7 | 6.39 | 0.83 | 0.00 |
| ME1 | 2 | 7 | 6.40 | 0.85 | 0.00 |
| ME2 | 1 | 7 | 6.51 | 0.82 | 0.00 |
| ME3 | 1 | 7 | 6.44 | 0.86 | 0.00 |
| ME4 | 1 | 7 | 6.24 | 1.15 | 0.00 |
| ME5 | 1 | 7 | 6.25 | 1.04 | 0.00 |
| PV1 | 1 | 7 | 6.21 | 0.95 | 0.00 |
| PV2 | 1 | 7 | 6.20 | 1.05 | 0.00 |
| PV3 | 1 | 7 | 6.07 | 1.17 | 0.00 |

Table 3.3: Descriptive Statistics and Normality Testing (cont.)

| Variable name ¹ | Minimum | Maximum | Mean | Standard deviation | p-value of univariate normality test ² |
|---|-------------------------|----------|--------------------------------------|--------------------|---|
| OS1 | 1 | 7 | 6.42 | 0.87 | 0.00 |
| OS2 | 1 | 7 | 6.16 | 1.06 | 0.00 |
| OS3 | 1 | 7 | 5.96 | 1.17 | 0.00 |
| OS4 | 3 | 7 | 6.13 | 1.01 | 0.00 |
| BI1 | 2 | 7 | 6.15 | 1.00 | 0.00 |
| BI2 | 2 | 7 | 6.34 | 0.90 | 0.00 |
| BI3 | 1 | 7 | 6.28 | 0.98 | 0.00 |
| Multivariate normality test [Partial model] | Mardia Skewness | = 138.73 | [$\chi^2 > 1,000$; p-value = 0.00] | | |
| | Mardia Kurtosis | = 529.35 | [$\chi^2 > 1,000$; p-value = 0.00] | | |
| | Henze-zirkler | = 19.03 | [$\chi^2 > 1,000$; p-value = 0.00] | | |
| | Doornik-Hansen χ^2 | > 1,000 | [p-value = 0.00] | | |
| Multivariate normality test [Complete model] | Mardia Skewness | = 274.97 | [$\chi^2 > 1,000$; p-value = 0.00] | | |
| | Mardia Kurtosis | > 1,000 | [$\chi^2 > 1,000$; p-value = 0.00] | | |
| | Henze-zirkler | = 6.59 | [$\chi^2 > 1,000$; p-value = 0.00] | | |
| | Doornik-Hansen χ^2 | > 1,000 | [p-value = 0.00] | | |

Notes: ¹ Acronyms presented in Table 3.2

² D'Agostino's univariate normality test updated by Royston (1991).

Source: Author's calculation.

The appropriate quantitative method to deal with a causal relationship model that is presented in Figure 3.1 and Figure 3.2 is a structural equation model (SEM). There are several analyses that should be done to ensure that the model is appropriate: construct reliability, construct validity, and average variance extracted of the set of observable variables. Moreover, the so called Cronbach's alpha test should have a value above 0.70 to ensure that these observable variables have relatively high internal consistency. This last concept means that the set of observable variables are closely related as a group to reflect the latent variable (Hair et al., 2010).

Construct reliability tests the ability of a set of observable variables to construct a latent variable. Hair et al. (2010) suggested to use the composite reliability (CR) to examine the construct reliability. CR presents the shared variance among a set of observable variables that measure an underlying latent variable (Raykov, 1997). The formula to calculate the composite reliability is (Raykov, 1997; Hair et al., 2010):

$$CR_j = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum \epsilon_i}$$

where CR_j = composite reliability of latent variable j.

λ_i = standardized factor loading for item i.

ϵ_i = error variance for item i ($\epsilon_i = 1 - \lambda_i^2$).

CR can take values from zero to one, where the higher the value, the better the construct. However, Hair et al. (2010) proposed that a CR above 0.70 is considered appropriate.

Construct validity is the examination of the ability of the set of observable variables to measure latent variables. The Chi-square test is applied to check the construct validity of confirmatory factor analysis (CFA). The null hypothesis of this test is that the covariance matrix of empirical data is similar to the covariance matrix of the model (Gatignon, 2010). Then, the acceptance of this hypothesis means that the observable variables are valid to represent the latent variable.

The average variance extracted (AVE) measures the amount of variance of the observable variables that is captured by the latent variable in relation to the amount of variance due to measurement error (Fornell and Larcker, 1981). The formula to calculate the average variance extracted is:

$$AVE_j = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \epsilon_i}$$

where AVE_j = average variance extracted of latent variable j.

λ_i^2 = squared standardized factor loading for item i.

ϵ_i = error variance for item i.

If the average variance extracted higher than 0.50, then the variance due to the measurement error is below the variance due to the construct.

The Cronbach's alpha, construct reliability, construct validity, and average variance extracted are presented in Table 3.4, which showed that these six latent variables have a good level of construct reliability and validity (Jöreskog and Sörbom, 1999; Hair et al., 2010).

Table 3.4: Reliability and Validity Test of Measurement Model

| Latent variables | Number of items | Cronbach's alpha | Construct reliability ¹ | Construct validity ² | Average variance extracted |
|---------------------------------|-----------------|------------------|------------------------------------|-------------------------------------|----------------------------|
| Country motivation (CM) | 4 | 0.84 | 0.85 | $\chi^2 = 2.25$ [p-value = 0.32] | 0.58 |
| Hospital motivation (HM) | 5 | 0.90 | 0.90 | $\chi^2 = 4.58$ [p-value = 0.21] | 0.65 |
| Medical service experience (ME) | 5 | 0.93 | 0.94 | $\chi^2 = 2.93$ (p-value = 0.23) | 0.76 |
| Perceived value (PV) | 3 | 0.77 | 0.78 | $\chi^2 = 3.79$ (p-value = 0.29) | 0.55 |
| Overall satisfaction (OS) | 4 | 0.90 | 0.90 | $\chi^2 = 0.10$ (p-value = 0.75) | 0.70 |
| Future behavior intention (BI) | 3 | 0.95 | 0.96 | $\chi^2 = 2.82$ (p-value = 0.42) | 0.86 |

Note: ¹ is the coefficient of composite reliability (Hair et al., 2010).

² is the Chi-square of confirmatory factor analysis (Jöreskog and Sörbom (1999) propose it must be not sig).

Hair et al. (2010) propose that Cronbach's alpha > 0.70, composite reliability > 0.70 and average variance extracted > 0.50.

Source: Author's calculation.

3.4.2 Results from structural equations' estimation

Two 'structural equation model' (SEM) are estimated in this chapter. The conceptual approach is a partial estimation which is extended in the second model. However, the two of them are of interest, as the first proposal is the one usually considered in the literature. Hence, for the sake of comparison, its estimation and discussion has been considered of interest. The results of both models are presented in the following subsections.

a) Model one: experiences and future behavior intention

This part presents the results from the study of the causal relationship between experiences and future behavior intention of medical tourists in Thailand (Figure 3.1). The model was adjusted by adding the correlation between the estimated

measurement errors of each latent variable (Brannick, 1995; Tomarken and Waller, 2005; Wang and Wang, 2012). This was done to ensure that the model fits with the empirical data.

The most commonly used goodness of fit statistics are presented in Table 3.5. The Chi-square tests as null hypothesis if empirical data's covariance matrix of (S) is equal to the covariance matrix of the model (Σ) [$H_0: S = \Sigma$]. A small Chi-square corresponds to good fit (not significant) and a large Chi-square to a bad fit of the estimation (significant) (Jöreskog and Sörbom, 1999).

Table 3.5: Goodness of Fit Statistics of Partial Model

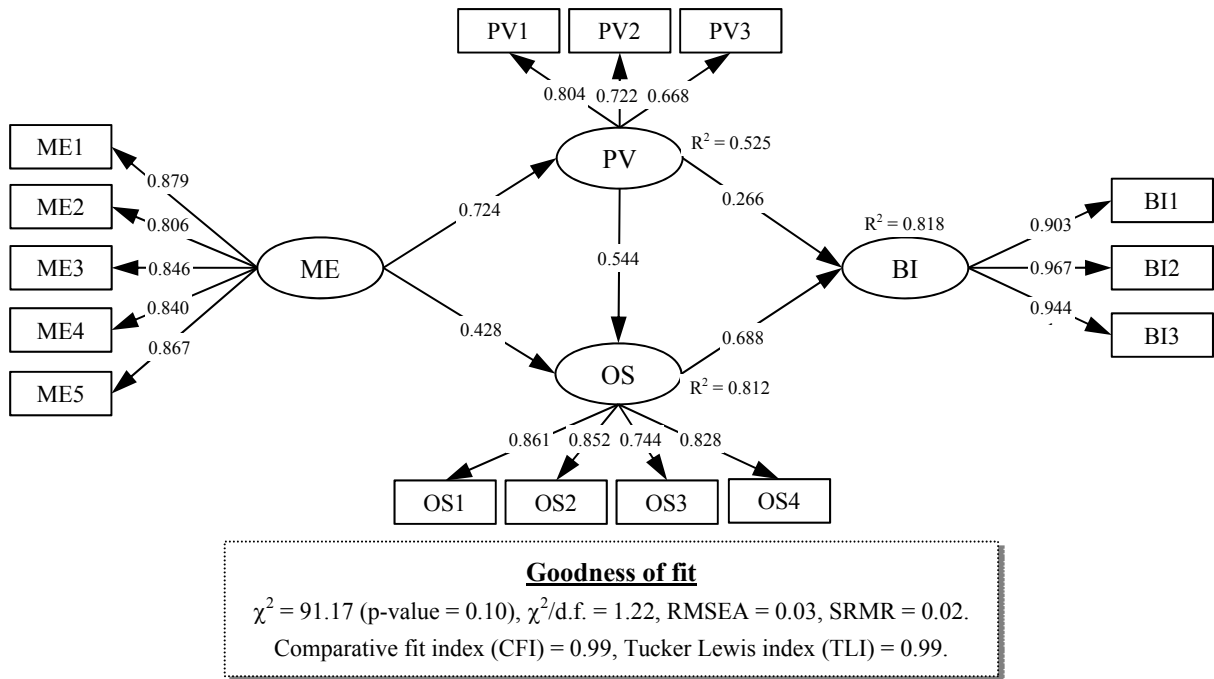
| Goodness of fit statistics | Conditions | Values | Acceptable |
|--------------------------------|--|--------------------------------------|------------|
| 1. χ^2 | low χ^2 and not Sig. (Jöreskog and Sörbom, 1999) | 91.17 [d.f. = 75, p-value = 0.10] | ✓ |
| 2. χ^2 /d.f. | ≤ 2.00 (Tabachnick and Fidell, 2012) | 1.22 | ✓ |
| 3. RMSEA | ≤ 0.07 (Steiger, 2007) | 0.03 [90% CI 0.00 : 0.04] | ✓ |
| 4. SRMR | ≤ 0.08 (Hu and Bentler, 1999) | 0.02 | ✓ |
| 5. Comparative fit index (CFI) | ≥ 0.95 (Hu and Bentler, 1999) | 0.99 | ✓ |
| 6. Tucker Lewis index (TLI) | ≥ 0.95 (Hu and Bentler, 1999) | 0.99 | ✓ |

Note: χ^2 = Chi-square, RMSEA=root mean square error of approximation, SRMR=standardized root mean square residual, CI = confident interval and scaling correction factor = 1.59.

Source: Author's calculation.

It should be noted that the value of Chi-square is sensitive to sample size, especially with more than 200 observations. If the sample size is big, the value of Chi-square will have a high probability to be significant (p-value < 0.05) (Cheung and Rensvold, 2002; Kline, 2010; Tabachnick and Fidell, 2012). Then, other goodness of fit statistics are used to complement Chi-square value. Tabachnick and Fidell (2012) suggested that a χ^2 /d.f. ratio of 2 or less is a reasonably good indicator of model fit. As a summary of this table, all the presented goodness of fit statistics of the model support the appropriateness of the estimation.

Figure 3.3 presents the standardized coefficients of the fitted model. The values in the arrows that connect observable variables (rectangle) and latent variables (circle) are the standardized factor loading scores. A higher value indicates that the observable variable is more suitable to represent the latent variables. The values between latent variables (circle) are the standardized coefficients of the SEM, which capture the direct effect. The estimated Chi-square and the corresponding p-value above 0.05 implies that we cannot reject the following null hypothesis: ‘the model fits empirical data’.



Note: all standardized coefficients and factor loadings are statistically significant at the 0.05 level.

Source: Author's calculation.

Figure 3.3: Standardized Coefficients of the Experiences and Future Behavior Intention of Medical Tourists in Thailand

All the hypotheses proposed in page 72 are not rejected at a five percent statistical level except hypothesis 3 (H_3 : Medical service experience has a direct effect on future behavior intention). Hence, that arrow is not shown in the Figure 3.3. The interpretation is that medical service experience has: Direct effect on perceived value; Indirect effect on future behavior intention; And direct and indirect effect on overall satisfaction. Perceived value has direct effect on overall satisfaction, and direct and indirect effect on future behavior intention. Finally, overall satisfaction only has direct effect on future behavior intention.

It can be concluded that medical service experience, perceived value and overall satisfaction, which are the factors that reflect medical tourists' experience in Thailand, had both direct and indirect effect on future behavior intention. If there are changes in medical service experience, it will impact on perceived value, overall satisfaction, and future behavior intention with a statistical significance at the 0.05 level.

Focusing now on the estimated factors loadings, we found that quality of the services (ME1) and adequate information (ME5) were the main indicators of medical service experience.

The medical tourists' perception about value for money (PV1) was the most important indicator of perceived value from medical services. In fact, 66 percent of all participants in the survey indicated that the cheaper price of medical treatments was the main reason to choose Thailand.

The factor loading analysis of overall satisfaction indicates that satisfaction with medical services (OS1) and greater satisfaction than expected (OS2) were its two main components. Whereas the willingness to recommend to friends and relatives (BI2) was the principal component of future behavior intention.

Table 3.6 presents the causal relations between the partial model's latent variables. The results from standardized coefficients' estimation with MLR showed that medical service experience had the greatest total effect on overall satisfaction. The magnitude of this effect was 0.819, which comprised both a direct effect (0.425) and an indirect effect (0.394) that passed through perceived value. Whereas perceived value receives the smallest effect from medical service experience, with a direct effect of 0.724. Perceived value had more total effect on future behavior intention than on overall satisfaction (0.629 and 0.544 respectively). While the direct effect of overall satisfaction on future behavior intention was 0.688. Hence, from this table, we can conclude that future behavior intention received the greatest total effect from medical service experience (0.739). It implies that if the services of private hospitals can provide good experiences to medical tourists, they will achieve positive future behavior intention (as willingness to visit and recommend).

Table 3.6: The Causal Relationship in the Partial Model

| Variable name | Direct effect | Indirect effect | Total effect |
|-----------------------------------|-------------------|-------------------|-------------------|
| Medical service experience | | | |
| - Perceived value | 0.724* (0.047) | - | 0.724* (0.047) |
| - Overall satisfaction | 0.425* (0.099) | 0.394* (0.072) | 0.819* (0.044) |
| - Future behavior intention | - | 0.739* (0.042) | 0.739* (0.042) |
| Perceived value | | | |
| - Overall satisfaction | 0.544* (0.088) | - | 0.544* (0.088) |
| - Future behavior intention | 0.266* (0.115) | 0.363* (0.100) | 0.629* (0.064) |
| Overall satisfaction | | | |
| - Future behavior intention | 0.688* (0.112) | - | 0.688* (0.112) |

Note: * is statistically significant at the 0.05 level.

The standard errors are in parentheses.

Source: Author's calculation.

The ability of this partial model to explain the causal relationship between each latent variable also considers from the coefficient of squared multiple correlations (R^2). That is because the R^2 presents the percentage of the variance of response variable which is explained by a model (Figure 3.3). Regarding the partial model, the coefficient of the R^2 of the variable 'future behavior intention' indicates that medical service experience, perceived value, and overall satisfaction can explain the variance of future behavior intention of medical tourists about 81.8 percent.

b) Model two: motivation, experiences and future behavior intention

This part presents the causal relationship between motivation, experiences, and future behavior intention of medical tourists.

Table 3.7 reports the goodness of fit statistics of this model. Chi-square test is significant (p -value < 0.05), which implies that covariance matrix of empirical data (S) does not correspond to the covariance matrix of the model (Σ). However, as was mentioned before, this problem is not unusual with samples above 200 observations.

Under those circumstances, the literature suggests to complement the Chi-square test with other goodness of fit statistics. As it can be seen in the table, the other goodness of fit statistics confirm that the model is appropriate to fit the empirical data.

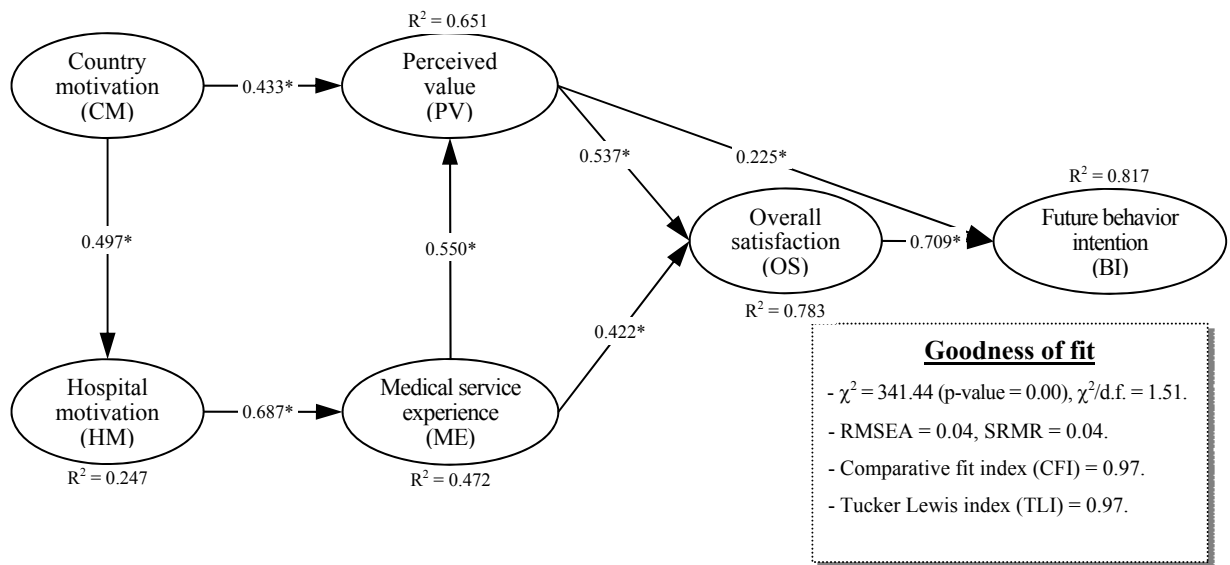
Table 3.7: Goodness of Fit Statistics of Complete model

| Goodness of fit statistics | Conditions | Values | Acceptable |
|--------------------------------|---|------------------------------|------------|
| 1. χ^2 | low χ^2 and not Sig. (Jöreskog and Sörbom, 1999) [d.f. = 226; p-value = 0.00] | 341.44 | × |
| 2. χ^2 /d.f. | ≤ 2.00 (Tabachnick and Fidell, 2012) | 1.51 | ✓ |
| 3. RMSEA | ≤ 0.07 (Steiger, 2007) | 0.04 (90% CI 0.03 : 0.05) | ✓ |
| 4. SRMR | ≤ 0.08 (Hu and Bentler, 1999) | 0.04 | ✓ |
| 5. Comparative fit index (CFI) | ≥ 0.95 (Hu and Bentler, 1999) | 0.97 | ✓ |
| 6. Tucker Lewis index (TLI) | ≥ 0.95 (Hu and Bentler, 1999) | 0.97 | ✓ |

Note: χ^2 = Chi-square, RMSEA=root mean square error of approximation, SRMR=standardized root mean square residual, CI = confident interval and scaling correction factor = 1.44.

Source: Author's calculation.

Figure 3.4 presents the standardized coefficients of the fitted model. The test of the hypotheses presented in page 74 reveals that only hypothesis eight (H_8 : Medical service experience has a direct effect on future behavior intention) could be rejected at a five percent statistical significance. It means that country motivation is an exogenous variable that influences on-site experience (medical service experience, perceived value, and overall satisfaction) and future behavior intention. This effect passes through hospital motivation. Medical service experience was the main mediator of country and hospital motivation to perceived value before transmitting that effect to overall satisfaction and future behavior intention.



Note: * is statistically significant at the 0.05 level.

Source: Author's calculation.

Figure 3.4: Standardized Coefficients of the Motivation, Experiences, and Future Behavior Intention of Medical Tourists in Thailand

Table 3.8 presents the standardized factors loading scores estimated with MLR. Note that reasonable price of treatments (CM1) was the main indicator of country motivation, followed by reasonable cost of stay in Thailand (CM3) and cheap and convenient travel from country of residence (CM2).

Effectiveness of treatment (HM3), quality of the services (HM1), and doctors' capability (HM2) were three main indicators of hospital motivation. On the other hand, services quality (ME1) and effectiveness of the treatments (ME3) were two core indicators to construct the latent variable 'medical service experience'.

Value for money (PV1) was the most important indicator of perceived value. While the factor loading analysis of satisfaction shows that satisfaction with the medical services (OS1) and satisfaction above expectation (OS2) were its two main components. Finally, the recommendation to friends and relatives (BI2) and the suggestion to visit Thailand if a family needs medical services (BI3) were two principal components of future behavior intention.

Table 3.8: Standardized Factor Loading of the Latent Variables

| Factors | Symbol | Factor loading | Squared multiple correlations (R²) |
|--|---------------|-----------------------|--|
| 1. Country motivation | CM | | |
| - Reasonable price of treatments | CM1 | 0.859 | 0.738 |
| - Travel from country of residence is cheap and convenient | CM2 | 0.709 | 0.502 |
| - Reasonable cost of stay in Thailand | CM3 | 0.735 | 0.540 |
| - Possibility to combine with tourism activities | CM4 | 0.546 | 0.298 |
| 2. Hospital motivation | HM | | |
| - Quality of the services | HM1 | 0.827 | 0.684 |
| - Capability of doctors | HM2 | 0.823 | 0.677 |
| - Effectiveness of treatments | HM3 | 0.874 | 0.763 |
| - Atmosphere and facilities | HM4 | 0.717 | 0.514 |
| - Adequate information of medical services | HM5 | 0.785 | 0.616 |
| 3. Medical service experience | ME | | |
| - Quality of the services | ME1 | 0.907 | 0.822 |
| - Capability of doctors | ME2 | 0.844 | 0.712 |
| - Effectiveness of treatments | ME3 | 0.877 | 0.769 |
| - Atmosphere and facilities | ME4 | 0.834 | 0.696 |
| - Adequate information of medical services | ME5 | 0.848 | 0.720 |
| 4. Perceived value | PV | | |
| - Good value for money | PV1 | 0.823 | 0.678 |
| - Good use of time | PV2 | 0.717 | 0.514 |
| - Good opportunities to combined medical services with tourism activities in the same trip | PV3 | 0.658 | 0.433 |
| 5. Overall satisfaction | OS | | |
| - In overall, I am satisfied with the medical services received | OS1 | 0.861 | 0.741 |
| - The satisfaction is greater than expected | OS2 | 0.851 | 0.723 |
| - The satisfaction with medical services in Thailand is greater than in my home country | OS3 | 0.742 | 0.551 |
| - The service-oriented staff in Thailand was beyond the expectation | OS4 | 0.825 | 0.681 |
| 6. Future behavior intention | BI | | |
| - Come back to receive medical services in Thailand, if needed | BI1 | 0.904 | 0.816 |
| - Recommend medical services in Thailand to friends and relatives | BI2 | 0.970 | 0.940 |
| - Recommend members of my family to go to Thailand, if they need medical services | BI3 | 0.941 | 0.886 |

Note: all of standardize coefficients and factor loading are statistically significant at the 0.05 level.

Source: Author's calculation.

The standardized coefficients estimated with MLR are shown in Table 3.9. Country motivation had the greatest effect on perceived value (0.620). The magnitude of its direct effect was 0.432, and the indirect effect was 0.188. Medical services experience received smallest total effect from country motivation, with an indirect effect of 0.341. While hospital motivation had the greatest total effect on medical service experience (0.687). Medical service experience had more total effect on overall satisfaction than on future behavior intention and perceived value (0.717, 0.632 and 0.550 respectively). Perceived value had more total effect on future behavior intention than on overall satisfaction (0.605 and 0.537 respectively). While, the direct effect of overall satisfaction on future behavior intention was 0.709. It was noteworthy that overall satisfaction was the variable that had the highest effect on future behavior intention. Hence, if the services of private hospitals can provide high perceived value to medical tourists, they will have positive intended future behavior.

The coefficient of squared multiple correlations (R^2) of the variable ‘future behavior intention’ as shown in Figure 3.4 shows that all latent variables in the complete model (country motivation, hospital motivation, medical service experience, perceived value, and overall satisfaction) can explain an impressive 81.7 percent of medical tourists’ behavior intention’ variance.

Table 3.9: The Causal Relationship in the Complete Model

| Variable name | Direct effect | Indirect effect | Total effect |
|------------------------------|-------------------|-------------------|-------------------|
| Country motivation | | | |
| - Hospital motivation | 0.497* (0.062) | - | 0.497* (0.062) |
| - Medical service experience | - | 0.341* (0.050) | 0.341* (0.050) |
| - Perceived value | 0.432* (0.052) | 0.188* (0.030) | 0.620* (0.050) |
| - Overall satisfaction | - | 0.477* (0.049) | 0.477* (0.049) |
| - Future behavior intention | - | 0.478* (0.047) | 0.478* (0.047) |

Table 3.9: The Causal Relationship in the Complete Model (cont.)

| Variable name | Direct effect | Indirect effect | Total effect |
|-----------------------------------|-------------------|-------------------|-------------------|
| Hospital motivation | | | |
| - Medical service experience | 0.687* (0.046) | - | 0.687* (0.046) |
| - Perceived value | - | 0.378* (0.044) | 0.378* (0.044) |
| - Overall satisfaction | - | 0.493* (0.059) | 0.493* (0.059) |
| - Future behavior intention | - | 0.434* (0.050) | 0.434* (0.050) |
| Medical service experience | | | |
| - Perceived value | 0.550* (0.052) | - | 0.550* (0.052) |
| - Overall satisfaction | 0.422* (0.090) | 0.295* (0.054) | 0.717* (0.053) |
| - Future behavior intention | - | 0.632* (0.047) | 0.632* (0.047) |
| Perceived value | | | |
| - Overall satisfaction | 0.537* (0.080) | - | 0.537* (0.080) |
| - Future behavior intention | 0.225* (0.100) | 0.380* (0.092) | 0.605* (0.059) |
| Overall satisfaction | | | |
| - Future behavior intention | 0.709* (0.098) | - | 0.709* (0.098) |

Note: * is statistically significant at the 0.05 level.

The standard errors are in parentheses.

Source: Author's calculation.

3.5 Conclusions

This chapter illustrates the behavior of medical tourists in Thailand through the analysis of the causal relationship between motivation, experience in using medical services, and future behavior intention with two models: The first model is a partial approach which analyzes the causal relationship between experiences and future behavior intention, which is found in many general previous studies on the behavior of tourists. The second model is a complete model that analyzes the magnitude of the influence of country motivation and hospital motivation on experiences and future behavior intention of medical tourists, this is the first attempt to incorporate the role of

motivation in a model of medical tourists' behavior. A structural equation model (SEM) is used to analyze 351 observations obtained from the interviews with medical tourists in five private hospitals in Pattaya, Phuket, and Bangkok, Thailand. The coefficients are estimated by MLR. This empirical data will be important for designing the appropriate tourism policies to increase the competitiveness of the medical tourism industry in Thailand in both micro (hospital) level such as the policy to enhance the ability to compete of private hospitals and macro (country) level such as the policy to improve the infrastructure to accommodate medical tourism.

The empirical study of the causal relationship between experiences and future behavior intention in Thailand revealed that medical service experience was the main factor affecting satisfaction and future behavior intention. While quality of the services and adequate information were the main indicators of medical service experience. Then, if private hospitals can provide quality medical services and adequate information about these treatments, it will improve medical tourists' experience, which in turn will lead to high satisfaction and positive future behavior intention.

The incorporating the role of motivation in a model of medical tourists' behavior demonstrated that country motivation was the main factor affecting medical tourists' perceived value (reasonable price of treatments and reasonable cost of living were the main indicators of country motivation). Additionally, hospital motivation (mainly captured by effectiveness of treatments) was the major factor that affected medical service experience. Regarding this complete model, overall satisfaction was the variable that had the highest total effect on future behavior intention, while medical service experience was the main factor affecting overall satisfaction. Hence, we can conclude that medical service experience was an important mediator variable that transmitted the effect of country motivation and hospital motivation to future behavior intention.

These results reflect that Thai government should promote medical tourism in Thailand by positioning itself as the 'worthwhile medical tourism market'. That is because reasonable price of medical treatments was a key component of country motivation that will raise satisfaction and perceived value of medical tourism, which will lead to good future behavior intention.

Medical tourism providers should focus on the effectiveness of treatments, good quality of the services, and capability of doctors to create good experience to medical tourists, and that will lead to positive intended future behavior.

3.6 References

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Chapter IV

Supply Analysis and the Competitiveness of Medical Tourism in Thailand

4.1 Introduction

This chapter presents two complementary supply approach analyses: Section 4.2 provides an overview of the Thai medical tourism market with information such as the share of medical tourists to total foreign patients, the reason why medical tourists choose Thailand, and relevant sources of information which are used in this decision. The next section evaluates Thailand's medical tourism competitiveness. The analysis combines the Porter's diamond model (Porter, 1990), to present the determinants of competitive advantage, and a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats). Moreover, the competitiveness study is complemented with a comparison of Thailand with their major competitors in Asia as Singapore, Malaysia, and India.

The data used for this study consists of both primary and secondary data. The former was obtained from two sources: The in-depth interviews with the administrators of private providers (explained in Chapter I); And the results from the questionnaire of medical tourists (presented in Chapter II). The secondary data gathers various sources of evidence, whether official documents or non-official publications. The use of multiple sources allowed data triangulation and thus enhances findings' reliability (Lincoln and Guba, 1985; Wong, Mistilis and Dwyer, 2011).

This PhD candidate believes that this study will let us understand the structure of medical tourism in Thailand. This information will be beneficial for healthcare providers, who are now participating in this market, or which might be interested in attracting it, to set or adjust their strategic marketing policies. Moreover, the analysis of Thailand's sources of competitive advantage and disadvantage compared with other competitors will be beneficial for the government and other related agencies to determine the policy priorities with might help to enhance Thailand's medical tourism competitiveness.

4.2 Medical Tourism in Thailand

Thailand has decades of experience in providing medical services to foreign patients staying in Thailand and the neighboring countries such as Myanmar, Lao PDR, and Vietnam, etc. The country became known as a destination for medical tourism as early as in the 1970s mainly due to the specialized in sex change operations and, later, in cosmetic surgery (Wilson, 2010; Wong and Musa, 2012; Alberti et al., 2014). However, the effort to attract international foreign patients beyond the regional level began in 1997 when the country faced the Asian financial crisis. At that time, private hospitals suffered an income reduction due to the decline of local patients (Connell, 2006; Bochaton, 2015), and shifted their focus outside Thailand. On the early days, private hospitals tried to attract international patients mainly taking advantage of the price competitiveness derived from the Thai Bath depreciation (Thailand Medical Tourism Cluster, 2011; Bochaton, 2015).

Thai government also viewed medical tourism as a tool to stimulate economic growth (Alberti et al., 2014), and has launched two strategic plans (Kittikanya, 2007; Pitakdumrongkit, 2017). The first plan (2003-2008) aimed at transforming Thailand into ‘the Excellent Medical Hub of Asia’. The second strategic plan was launched in 2014 (2014-2018) with the title ‘Thailand as a World-Class Health Care Provider’, and aimed to advance in four areas: medical services, health promotion, traditional and alternative medicine, and herbal products. Note that the second strategic plan was launched six years after the end of first plan, the reason behind the delay was the internal political crisis.

There are four main authorities related with Thailand’s medical hub policies. Each of them has different responsibilities related with this industry (Pitakdumrongkit, 2017):

- 1) *The Ministry of Public Health (MOPH)* acts as a leader in shaping Thailand’s national health strategic plans. It seeks to ensure equitable access to medical treatment of Thai people, and to guarantee the sustainable development of the country’s healthcare system.
- 2) *The Ministry of Commerce (MOC)* has the duty to use medical tourism as a method for boosting export revenues and economic development.

- 3) *The Tourism Authority of Thailand (TAT)* is the institution responsible of Thailand's marketing policies. In this sense, it has the responsibility to promote internationally Thailand's medical services.
- 4) *The Thailand Board of Investment (BOI)* tries to attract investment from abroad by giving incentives in the healthcare sector, such as income tax exemptions, lifting alien equity restrictions on specific areas of healthcare services, and waiving the duties imposed on imported medical equipment (Thailand Board of Investment, 2016).

It should be noted that MOPH focuses more on the medical aspect of the service, while the other three agencies are more related with the economic impact and promotion of medical tourism.

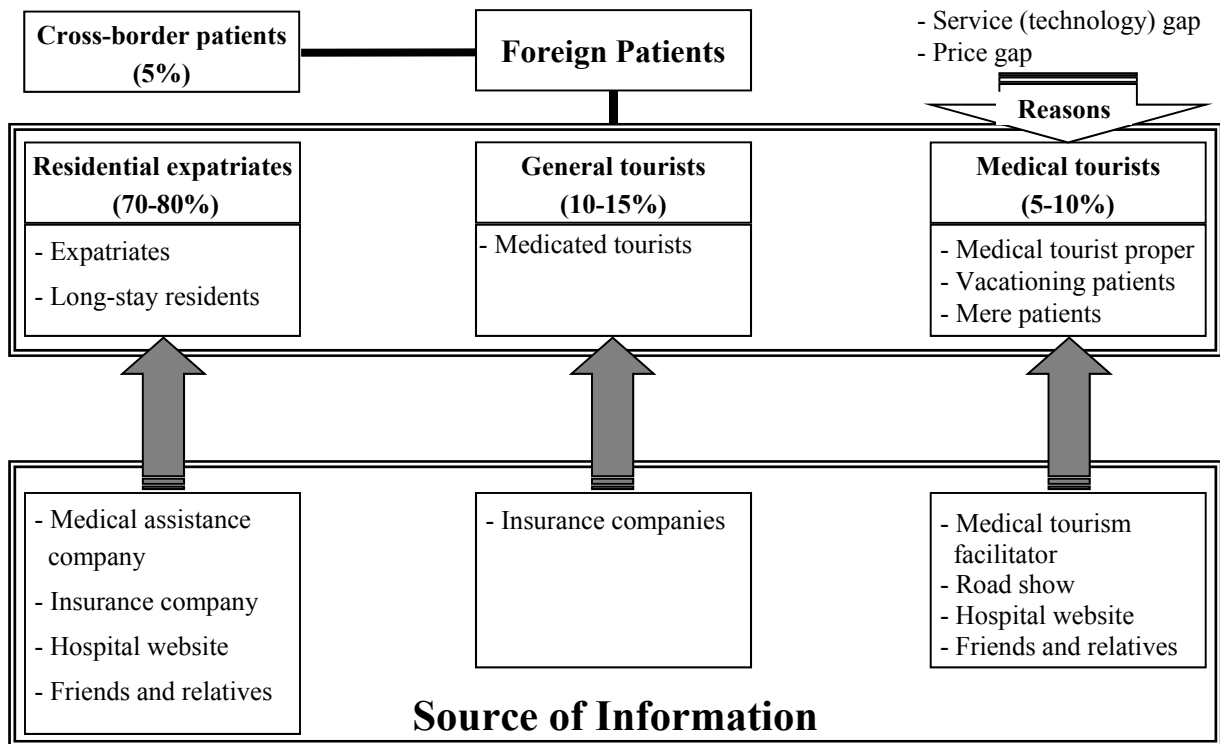
Regarding the evolution of the medical hub economic impact, in 2009 Thailand earned a revenue of US\$ 3.2 billion from foreign patients (Department of Export Promotion, 2013), and its increased to US\$ 5.0 billion in 2015 (Department of Health Service Support, 2016). This trend represents an 8 percent yearly growth during the period 2009-2015.

It should be noted that all foreign patients receiving medical services in Thailand are not medical tourists. To understand the size of medical tourism market in Thailand, the next subsection presents the structure of foreign patients in Thailand, and estimates the proportion of medical tourists from all foreign patients. This will be followed by the analysis of the factors influencing the decision-making of medical tourists in Thailand, and the sources of information which are used in that process.

4.2.1 The structure of foreign patients in Thailand

The information from the interviews with the administrators of private providers, explained previously, has been used to construct Figure 4.1. This schema disaggregates the Thailand's foreign patients in groups with different characteristics and behavior. The figure also describes the estimated sizes of each group and the sources of

information that they tend to use to choose the medical provider. All this information is described in the following paragraphs.



Source: Synthesis from the interviews with medical tourism providers in Thailand.

Figure 4.1: Structure and Sources of Information of Foreign Patients in Thailand

Combining the classification provided in the literature (Cohen, 2008¹⁵) and the information from the administrators of private providers, it is possible to identify three groups of foreign patients:

1. Residential expatriates: This is a group of foreigners living in Thailand or in the neighboring countries, which most of the interviewees (9 out of 12 or 75 percent) estimated to account for 70-80 percent of total foreign patients in Thailand. These expatriates can be divided into two subgroups depending on their working status:

a) *Expatriates in Thailand and neighboring countries:* This group of expatriates is comprised of foreigners who work in Thailand or in neighboring countries such as Myanmar, Lao PDR, or Cambodia (which have worse medical services than Thailand). The employee usually

¹⁵ Presented in Chapter I.

receives one of these two types of health cover: An insurance company that will pay for the costs of their treatments; Or a medical assistance company¹⁶ that will recommend the appropriate procedures and hospitals for the treatments, which will be paid afterwards by the employer. Given that this segment uses conventional medical assistance, the types of treatments that they receive are diverse, including health check-up, dentistry, accidental injury, or the cure of complex disease as heart disease, or cancer.

Most of the interviewees (9 out of 12 or 75 percent) agreed that the proportions of the expatriates in Thailand and neighboring countries were about 70-75 percent of all residential expatriate's patients.

b) Long-stay residents in Thailand: Most of them are retired foreigners (the bigger group is from Japan (Miyashita et al., 2017)) who decided to stay in Thailand for a long time due to the lower cost of living and medical cost compared with their origin country (Hongsrnagon, 2005; Fukahori et al., 2011; Miyashita et al., 2017). When these residents need medical treatments, if they have insurance, this company usually provides a list of hospitals to which they can attend. If they have more freedom, the recommendation of friends and relatives is the main source of information that they use to choose the hospital. In other cases, they find the information by themselves from the website of the hospitals. The types of treatments that most long-stay residents received are related with general health problems as colds and stomachache, health check-up, or dentistry.

The proportion of this group of patients was estimated by most interviewees (75 percent) to account for 5 percent of all residential expatriate's patients.

¹⁶ Medical Assistance Company is a company offering medical helps to customers who mostly work in Multinational Corporations (MNCs), Oil rig, etc. This company will coordinate with other agencies to serve its clients such as medical services, transporting patients (ambulance or charter aircraft), etc. The services will be provided via phone, email, video conferencing.

2. General tourists who have a health problem in Thailand: This group includes foreigners who come to Thailand for tourism purpose, but go to a hospital due to an accident or an unexpected health problem. Cohen (2008) defines this group of patients as ‘medicated tourists’. These tourists normally travel to major tourist destinations in Thailand such as Bangkok, Phuket, Pattaya, Samui, and Chiang Mai. These areas gather a large number of tourists and residents with good economic condition. Hence, they have private hospitals, usually certified by the international organizations like Joint Commission International (JCI¹⁷), which ensure good-quality services.

Most of the interviewees (8 out of 12 or about 67 percent) estimated that general tourists accounted for 10-15 percent of all foreign patients. The most common treatments include digestive system problems or accidental injury.

3. Medical tourists: Foreign patients within this group travel to Thailand to receive medical services, or they voluntary decide to receive a treatment after arriving to Thailand. Cohen (2008) suggested that foreign patients within this group can be divided among three categories:

- a) *Foreign patients traveling to Thailand only for medical services.* They do not engage in tourism activities during their stay in Thailand. Cohen (2008) defines foreign patients in this group as ‘mere patients’.
- b) *Foreign patients taking tourism as a complementary activity to their treatment.* Cohen (2008) referred to this group as ‘vacationing patients’.
- c) *Foreign patients who travel to Thailand equally for tourism and medical services.* The decision to receive medical services in Thailand may occur before traveling to Thailand (at the country of origin) or upon arrival to Thailand (at the destination). Cohen (2008) defines foreign patients in this group as ‘medical tourist proper’.

¹⁷ JCI (Joint Commission International) is an independent organization of United States that accredits the quality of hospitals and has been accepted internationally.

This group of foreign patients was estimated by most of the interviewees (8 out of 12 or about 67 percent) to account for 5-10 percent of all foreign patients. This proportion is consistent with Noree, Hanefeld and Smith (2016), which estimates that the number of medical tourists is about 10 percent of the number of foreign patients reported by Thai government agencies.

Finally, around a 5 percent of foreign patients are citizens from the cross-border neighboring countries as Myanmar, Lao PDR, or Cambodia who travel to geographically contiguous countries to get the closest available care (Connell, 2013; Bochaton, 2015). Most of them are poor and receive free medical treatments from Thailand public hospitals located close to the border.

As a summary, this section has disaggregated the total number of foreign patients into different groups. However, this PhD focuses exclusively on the third group, the medical tourists. Although 67 percent of the interviewees estimated that this group accounts only for 5 to 10 percent of total foreign patients, it generates a lot of revenue to Thai economy (NaRanong and NaRanong, 2011; Wongkit and McKercher, 2013; Noree, Hanefeld and Smith, 2016).

4.2.2 Factors influencing the decision-making of medical tourists

This section presents the medical tourists' motivation to go to Thailand. The academic literature indicates that the main reasons for which people travel out of their home countries to receive medical treatments are:

(1) *Cost savings due to the lower price of treatments* (Horowitz and Rosensweig, 2007). Previous studies also highlight that in some cases those treatments are not covered by patients' health insurance at home countries (Horowitz and Rosensweig, 2007; Cabrera, 2010; Heung, Kuchukusta and Song, 2010; Knight, 2010; Voigt et al., 2010).

(2) *Unavailability of medical treatment at home countries*. Some medical procedures are illegal or unavailable in some countries, such as stem cell or fertility treatments (Manaf et al., 2015; John and Larke, 2016).

- (3) *Avoiding long waiting lists at home countries.* Especially those who are seeking elective procedures as cosmetic surgery as well as those who suffer from chronic pain or disability (Connell, 2006; Horowitz and Rosensweig, 2007; Pachisa, 2010; Wongkit and McKercher, 2013; Alberti et al., 2014).
- (4) *Privacy and confidentiality.* Some patients want to guarantee the maximum privacy when they are treated. That is the case particularly for plastic surgery, cosmetic, sex change procedures and drug rehabilitation (Horowitz and Rosensweig, 2007; Reddy, York and Brannon, 2010).

Motivation is the basic concept for understanding the factors influencing people to travel abroad (Iajevardi, 2016). Most previous studies have widely accepted that the analysis of motivation is based on two dimensions: push and pull factors (Uysal, Li and Sirakaya-Turk, 2008). Some previous studies also highlight that these two factors were related (Kim and Lee, 2002; Baloglu and Uysal, 2006). Push factors are defined as internal motives or forces that cause tourists to seek activities to reduce their needs, while pull factors are destination generated forces, and the knowledge that tourists hold about a destination (Gnoth, 1997). Pull factors emerge due to the attractiveness of a destination, including beaches, recreation facilities and cultural attractions (Uysal and Jurowski, 1994). Generally, push factors are considered important in initiating travel desire, while pull factors are considered more decisive in explaining destination choice (Crompton, 1979; Bello and Etzel, 1985).

Medical tourism comprises both medical treatments and tourism. Although, the core product is medical treatment, attractiveness, hospitality, and travel options are also essential (Heung, Kucukusta and Song, 2010). Therefore, push motivations in medical tourism were those factors which encourage people to travel somewhere to search for the medical services such as cost, waiting lists and availability, privacy and confidentiality. While, pull motivations were those factors that influence the decision to select destinations such as facilities at the destination, safety, friendliness, competence, and reputation of hospital (Cormany, 2010; Altin, Singal and Kara, 2011).

Before presenting the medical tourists' motivation to travel to Thailand, the following paragraphs display an overview of the push and pull factors that attract tourists to travel across borders to receive medical services, especially in developing countries in Asia. From the literature (Heung, Kucukusta and Song, 2010; Altin, Singal and Kara, 2011; Fetscherin and Stephano, 2016; Iajevardi, 2016), we can summarize push and pull factors as presented in Table 4.1.

Table 4.1: Push and Pull Factors for Medical Tourism in Asia

| Push factors | Pull factors |
|---|---|
| 1. High cost of medical treatments in developed countries. | 1. High technology in medical services. |
| 2. Excess demand for medical services in developed countries which cause long waiting queues. | 2. Popularization of low-cost airlines. |
| 3. Various types of medical services are not covered by health insurance. | 3. Famous tourist destination. |
| | 4. Government support. |

Source: Heung, Kucukusta and Song, 2010; Altin, Singal and Kara, 2011; Fetscherin and Stephano, 2016; Iajevardi, 2016.

a) Push factors

1) *High cost of medical treatments in developed countries*: The cost of medical services in developing countries is cheaper when compared to similar services in developed countries. That increased the number of medical tourists, especially from developed countries like the United States, Europe, and Oceania that would like to receive medical services in developing countries.

2) *Excess demand for medical services in developed countries*: Medical services in developed countries are inadequate to meet the local demand. One reason behind this problem is the change of the population structure due to the increase of elderly population that needs more health services (United Nations, Department of Economic and Social Affairs, Population Division, 2015). In addition, in many countries, there has been a steady growth of non-communicable diseases (cancer, heart attacks, etc.) which resulted from new patterns of life as greater fast-food intakes. Then, it increases the number of patients with such diseases that decided to get medical services abroad to avoid the long waiting queues (Cooper, Vafadari and Hieda, 2015).

3) *Various types of medical services are not covered by health insurance:*

Some types of medical services such as cosmetic surgery or dentistry are usually not covered by health insurance. Then, people who need these services decide to travel to Asian countries where prices of treatments in such categories are cheaper.

b) *Pull factors*

1) *High technology in medical services:* Several countries in Asia have achieved very advanced medical technology, which is equal or better than in many developed countries. For example, Bangkok Hospital offers Gamma Knife treatment¹⁸ for neurological diseases. Then, this modern technology attracts people to receive medical treatments in these developing countries (Enderwick and Nagar, 2011).

2) *Popularization of low-cost airlines:* There are many low-cost airlines in Asia offering both, domestic and international flights. This makes worldwide travel more comfortable, and also decreases the travel costs. Hence, people are interested in using medical services in this region because of the cheaper price of both medical treatments and travel cost (Visa, 2014).

3) *Famous tourist destination:* Many countries in Asia such as Thailand, Singapore, or Malaysia are destinations with many tourist attractions. Hence, it is a good opportunity for medical tourists to combine tourism and medical services in these destinations.

4) *Government support:* The governments of many Asian countries are trying that their countries become a medical hub of this region. Then, it causes the development of healthcare services and attracts medical tourists to go to these countries (International Trade Center, 2014).

After the revision of the literatures on push and pull factors, the remaining of this section uses the information from both primary data sources (in-depth interviews and tourists' questionnaire) to analyze the motivation of medical tourism in Thailand.

¹⁸ Gamma Knife treatment (radiosurgery) is a type of radiation therapy used to treat tumors, vascular malformations and other abnormalities in the brain.

Regarding the division between push and pull factors, the fact is that sometimes push factors in origin countries (e.g. higher price of treatments) are the pull factors in destination countries (e.g. lower price of treatments). This study decides to use the ‘gap’ to explain the motivation of medical tourism in Thailand. That is because the motivation to go abroad for receive medical treatment occur from the difference (or gap) of the push and pull factors (e.g. price) between home country and medical tourism destination.

This study classified the factors influencing the decision to receive medical services in Thailand into three categories:

1) *Price gap*

Thailand has high-quality medical services and international recognition due to: the development of a health service system, the efforts to train its personnel, and the investment in medical technology. However, the price of those services is cheaper compared with many developed countries (Alberti et al., 2014; Pitakdumrongkit, 2017). This price gap attracts patients from countries such as Japan, United States, Australia, and New Zealand. This group of medical tourists felt that traveling to Thailand is worth the money paid (good value for money). Moreover, Thailand also has a lower cost of living (accommodation cost or travel cost) than some major competitors in medical tourism as Singapore (MacReady, 2007; Kanittinsuttitong, 2015).

2) *Service (or technology) gap*

The gap of the medical service (service gap) as well as a gap in terms of the range (or the diversity) of medical technology (technology gap) between Thailand and the home countries of medical tourists is one reason attracting them to Thailand. Several private hospitals are specialized in particular treatments such as orthopedics, cardiology, or cosmetic surgery. They invest a lot in medical technology and knowledge to provide advanced medical services, such as surgical technology without scars, to the patients.

The medical tourists who visited Thailand for service (or technology) gap generally do not care much about the services’ cost. They pay more attention to the technology or variety than to the low price of treatments. Usually they have a good economic situation, or an insurance company responsible for their expenses. Most of them are residents of Thailand’s neighbor countries like Cambodia, Lao PDR, Myanmar,

Vietnam, etc. The information of the National Statistical Office (2013) showed that in 2013 patients from ASEAN countries (Cambodia, Lao PDR and Myanmar) accounted for 33 percent of all foreign patients.

Private hospitals in Thailand have international reputation of good medical treatments' standard, which is reflected by certificates as JCI. Moreover, some hospitals offer a refund or a new medical treatment (without charge) to patients if the treatment is not satisfactory, especially in the case of cosmetic surgery.

3) *Other factors*

Besides price and service (or technology) gap, there are other factors that attract medical tourists to Thailand.

- *The 9/11 event*: After the World Trade Center terrorists attack on September 11, 2001, there was an increase in patients from Middle East traveling to Thailand and other countries in Asia (Cohen, 2008; Pitakdumrongkit, 2017). That is because the United States has become more stringent in checking those arriving from countries in the Middle East.
- *The advantage of the Thailand's location*: Thailand is a Southeast Asian region aviation hub (Webster, 2005; World Bank, 2016; Merle, 2017). Hence, traveling with other countries is convenient. In addition, the abundance of low-cost airlines reduces the cost of traveling.
- *Famous tourist destinations*: Thailand has several tourist centers with major private hospitals. Then, visitors can combine tourism activities with medical services. Moreover, the culture of Thailand which is friendly and welcoming to visitors (known as 'Thainess') allows tourists to feel welcome and safe during the stay in Thailand.

4.2.3 *Medical tourists' sources of information for decision-making*

This part presents the sources of information used to choose the hospital. Understanding this is crucial for shading light on the choice process of medical tourism.

Also, from the destination and private provider's point of view, it will help to define appropriate policy recommendations to improve the communication with the potential medical tourists. The information obtained from the interviews with the administrators of private providers suggested four main sources of information:

1) *Medical tourism facilitator*: It works like a travel agent who contacts the hospital's marketing department to obtain a price offer for each treatment. With that they might propose a medical tourism package that will be offered to the potential client. This package may consist of medical services, tourism activities during a recuperation period or after the treatment, as well as the accommodation. Tourists can complement the packages from travel agents by choosing additional items such as the type of tourism activities or accommodation. This company usually takes care of the patient since their arrival to Thailand until their departure. It includes services such as the shuttle from the airport to the hospital, the hospital to the hotel, and the hotel to the attractions, etc.

Some medical tourism agents will assign a program manager or assistant to take care of all arrangements before and during their stay in Thailand, including meeting them at the airport, acting as their local guide, and/or helping them to communicate with their family (Smith and Forgione, 2007). Many medical tourism agents also arrange follow-up care services in the patient's home country (Horowitz and Rosensweig, 2007).

The interviewed administrators indicate that in the past there was exclusivity in the relation between a medical tourism facilitators and one hospital. However, in the present, medical tourism facilitators act as sales agents of several hospitals. And hospitals also work with more than one medical tourism facilitator.

The agents will usually ask customers about hospital's service quality, which is important information for future potential customers.

2) *Road show*: hospitals use a business partner abroad to organize an exhibition or road show to provide an opportunity for interested people to meet with the representative of hospitals.

3) *Hospital marketing*: in various forms such as websites, brochures, and billboards. Also, some hospitals engage in social responsibility activities (as educating staff and funding hospitals in some underdeveloped countries) to create a positive reputation of the Thai hospitals in those countries.

4) *Friends and relatives*: Finally, it is usual that foreigners interested in traveling to Thailand to receive a treatment, ask for recommendation from friends or relatives who have international medical services experience.

As a general conclusion, most medical tourists choose the hospital to receive medical services from the recommendation of medical tourism facilitators. That is because these tourism agents have lots of information about medical tourism in Thailand no matter the specialization of the hospital, reputation of physicians, or price of treatments.

4.3 Competitiveness Analysis of Medical Tourism in Thailand

This thesis takes advantage of the exclusive access to primary information created by the researcher to assess Thailand’s medical tourism competitiveness. To conventional approaches, corresponding to the following subsections, are going to be applied: ‘Porter’s diamond’ model (Porter, 1990) and SWOT analysis. Table 4.2 summarizes the previous studies that used a similar methodological approach.

Table 4.2: Main Studies on ‘Porter’s Diamond’ Model and SWOT Analysis in the Case of Medical Tourism in Thailand

| Author | Diamond model | SWOT analysis |
|-------------------------------------|----------------|----------------|
| Harryono et al. (2006) | ✓ [T] | - |
| Enderwick and Nagar (2011) | ✓ [T, S, M, I] | - |
| Hin, Bohari and Pu (2013) | ✓ [T, M] | ✓ [T, M] |
| Alberti et al. (2014) | ✓ [T] | - |
| Bhaidkar (2014) | ✓ [I, T] | - |
| Wong, Velasamy and Arshad (2014) | - | ✓ [T, S, M, I] |
| Manirochana and Vivanichakul (2016) | ✓ [T] | ✓ [T] |

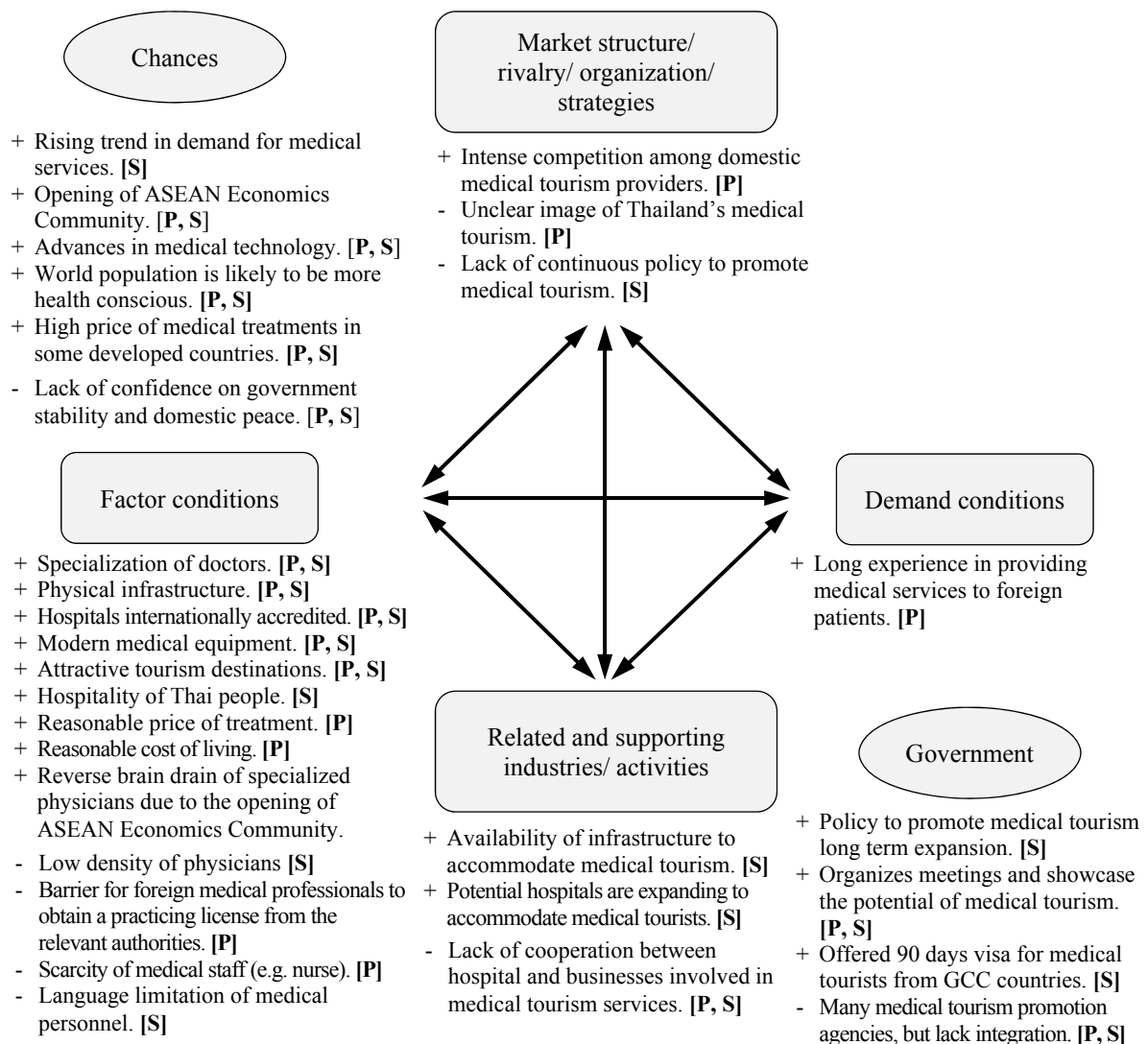
Note: T= Thailand, S = Singapore, M = Malaysia and I = India.

4.3.1 Determinants of competitive advantage, 'Porter's diamond' model

Medical tourism combines tourism and medical services. Hence, both factors should be considered when analyzing this segment. This makes the assessment of medical tourism competitiveness different from previous competitive analyses studying general, or other segments competitiveness (Clancy et al., 2001; Bobircă and Cristureanu, 2006; Mazurek, 2014).

The qualitative assessment of tourism competitiveness at the destination level can be done using a conceptual model of destination competitiveness as the Porter's diamond that focuses on the determinants of competitive advantages. Porter (1990) identified four interdependent determinants: factor conditions, demand conditions, related and supporting industries/activities, and the conditions at the destination (market structure, rivalry, organization and strategies). He also proposed two additional variables, chance and government, which support and complement the system of destination competitiveness.

The main contribution of this study is the combination of several data sources to analyze the competitiveness of medical tourism in Thailand. Previous studies that applied Porter's diamond model to analyze the medical tourism competitiveness in Thailand used only secondary data. The data used in this analysis comprised primary data obtained from: the in-depth interviews with private providers' administrators, and the survey of medical tourists in Thailand. As well as the secondary data obtained from literature review (Harryono et al., 2006; Manirochana and Vivanichakul, 2016) and other relevant agencies as World Health Organization and the Joint Commission International. The analysis of Thailand's medical tourism competitiveness is presented in Figure 4.2 and explained in the following paragraphs.



Note: Primary data denoted with “P” and secondary data denoted with “S”

Source: Synthesized base on diamond model that propose by Porter (1990)

Figure 4.2: Determinant of Thailand’s Medical Tourism Competitiveness

1) Factor conditions

Regarding the factor endowments, Thailand has quality and abundant resources in both medical and tourism aspects. Thailand has the highest number of hospitals that have obtained the Joint Commission International (JCI) accreditation (42 hospitals) compare with our major competitors in Asia: Singapore (10 hospitals), Malaysia (11 hospitals), and India (28 hospitals) (Joint Commission International, 2017). The specialized physicians in Thailand have international reputation, especially in cosmetic surgery, and some of them are trained abroad as the United States of America, United Kingdom, or Australia. Several leading private hospitals have the state-of-art

medical equipment as Gamma knife. The survey of medical tourists in Thailand found that more than 90 percent had the highest satisfaction level with the capabilities of doctors, effectiveness of treatments, and quality of the services.

Thailand also has availability of tourism resources to attract medical tourists (accommodation, transportation, etc.). Some private hospitals have their own accommodations to service their patients and companions during the recuperation period or after the treatment. Moreover, Thailand is a well-known tourism destination. So medical tourists can combine treatments and tourism in the same trip. Another unique advantage of Thailand is the hospitality reputation (known as ‘Thainess’). Its global reputation for graceful and attentive service supports the competitiveness of medical tourism in Thailand for a long time. However, some private providers (3 out of 12 of the interviewees) stated that this advantage is disappearing as other countries are improving the quality of their service.

Regarding the cost of medical services, the price is cheaper in Thailand than in some developed countries (<http://medicaltourism.com>). That can be explained as labor cost in Thailand is lower than in those countries. Moreover, Thailand has relatively low cost of living (accommodation, transportation, etc.). Hence, the total cost of the stay and treatment is attractive, even if the quality has a comparable level. The interviewed administrators thought that reasonable price of treatments, and reasonable cost of living were the two main factors that attract medical tourists to Thailand. Additionally, more than 90 percent of tourists in the sample answered that their experience in Thailand was a worthwhile for both time, and money paid.

A negative factor condition for Thailand is the lower density of physicians compared with Asian competitors. World Health Organization (2017) indicates that the density of physicians (per 1,000 population) in Thailand was only 0.4, while Singapore, Malaysia, and India had 1.9, 1.3, and 0.7 respectively¹⁹. Hence, Thailand may face a lack of physicians in the future, especially in some fields like heart surgery. The information from the administrators of private providers was that the criteria for foreign physicians

¹⁹ The available information on physicians’ density is from different years (Thailand (2010), Singapore (2013), Malaysia (2011), and India (2014)). However, it is the latest information from World Health Organization (2017).

to obtain a practicing license from the relevant authorities as Thai Medical Council is strict. Foreign medical professionals with recognized qualifications are allowed to practice in Thailand, but they are required to pass an examination in Thai language. Then, it is difficult for foreign physicians to work in Thai hospitals while there remains the shortfall of Thai doctors. Each year, Thai public and private medical schools produce about 2,500 new graduates. It has been estimated that at the current rate of training, Thailand will not achieve its targeted physician density (1 per 1,500 people) until 2020 (Suphanchaimat, et al., 2013). Moreover, the administrators also told that Thailand suffered a high medical staff's turnover rate, especially nurses, which causes time waste for training new staffs.

Another disadvantage of Thailand is the language limitation. Thai medical staffs have lower English level, which causes a communication obstacle. Another potential negative factor was pointed by Manirochana and Vivanichakul (2016), which indicates that after the opening of ASEAN Economics Community (AEC), Thailand may see how specialized physicians emigrate to the other countries, as Singapore, with higher remuneration. However, participants in our in-depth survey (10 out of 12 or about 83 percent) thought that few physicians would like to do so. That is because although the physician in Singapore gets high compensation, the cost of living in Singapore is also expensive. The administrators thought that some Thai physicians may move to neighboring countries as Myanmar or Cambodia to work on Thai private hospitals that have branches in these countries (e.g. Bangkok Hospital). On the other hand, there are some administrators (3 out of 12 or about 25 percent of the interviewees) that thought that some Thai physicians who work in developed countries, like the United States or Australia, may decide to come back to Thailand (or reverse brain drain). That is because they might see a good opportunity to receive high remuneration after the opening of AEC, which may result in an increase of medical tourists in Thailand. Moreover, cost of living in Thailand is lower than in these developed countries, and these physicians can stay closer to their family.

2) Demand conditions

Regarding the demand conditions, Thailand has long experience in attending foreign patients as long-stay residents or expatriates. 5 out of 12 of the administrators in

our interviews told that Japanese had been familiar with Thai hospitals for a long time, and many medical tourists came due to the recommendation of these previous customers. This information is consistent with the survey of medical tourists in Thailand in which respondents indicated that friends and relatives are their main source of information for decision-making. Then, the long experience in providing medical services to the foreigner is Thailand's advantage.

3) Market structure/ rivalry/ organization/ strategies

The interviews with the administrator of private providers found that there was an intense competition among domestic medical tourism providers. As a consequence, private hospitals tried to improve their service quality and import advanced medical technology. This explains that many hospitals obtained the Joint Commission International (JCI) accreditation, and now Thailand has the highest number of hospitals accredited by JCI (Joint Commission International, 2017).

A Thailand's disadvantage in the opinion of the 50 percent of the administrators was the unclear image as medical destination compared mainly with Singapore, which has successfully positioned itself as 'the hub of advanced medical technology'. Most private hospitals in Thailand offer a diversity of medical treatments without a clear image about their specialized. There are few hospitals that have positioned themselves as specialized in some treatments as cosmetic surgery or obstetrics.

Another disadvantage of Thailand is that the Thai's public agencies did not have a continuous policy to promote medical tourism. For example, the Tourism Authority of Thailand (TAT) launched its 'E-Marketing Campaign for Medical Tourism in Thailand' during 2010-2012, but now this website already disappeared.

4) Related and supporting industries/ activities

Thailand has many low-cost airlines that connect with other countries in Asia. Hence, the traveling cost in Thailand is cheap and convenient. Most private hospitals are located in Bangkok and other attractive tourist destinations as Pattaya, Phuket, or Samui. Then, these destinations can supply medical and tourism services.

The success of medical tourism in previous years has attracted investment. For example, during 2013 to 2016, the Bangkok Dusit Medical Services (BDMS), Thailand's largest private healthcare group, built 12 new affiliated hospitals (in Chiang Mai, Phitsnulok, Khon Kaen, etc.). The number of hospitals of this group increased from 31 hospitals in 2013 to 43 hospitals in 2016. Moreover, in early 2017, the BDMS group purchased a 24,000 squared meters' land in Bangkok to build a Wellness Clinic to provide integrated care for their clients (Bangkok Dusit Medical Services, 2016).

Thailand still lacks of cooperation between hospitals and related businesses in medical tourism services, and there is no institution to foster this collaboration. This is a negative item of the country's competitiveness.

5) Government

Since 2003, Thai government has strategic plans to drive the country as the medical hub of Asia. The efforts are centered in developing the services and promoting Thailand's medical tourism. Since 2013, Thailand also offered a 90 days visa for medical tourists and their companion (no more than three persons) from the Gulf Cooperation Council (GCC)²⁰ (Royal Thai Embassy Abu Dhabi, 2013).

Thailand has four main agencies with responsibilities in the task of creating a medical hub, as mentioned in section 4.2. However, they have different duties and there is no link and integration between them.

6) Chances

Several factors can be remarked as opportunities of Thailand to enhance their competitiveness in the future: the increasing demand for medical services, the opening of ASEAN Economics Community (AEC), the price of treatments in developed countries (<http://medicaltourism.com>), and a more health-conscious world population (VISA, 2014; United Nations, Department of Economic and Social Affairs, Population Division, 2015).

²⁰ Gulf Cooperation Council is political and economic alliance of six Middle Eastern countries –Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE.

All participants in the in-depth interviews indicate that the opening of ASEAN Economic Community (AEC) is likely to increase intra-regional medical tourism. It is expected that ASEAN countries may improve their economic condition, and hence more people will travel to neighboring countries with more advanced medical technology, like Thailand. In addition, there are plans to establishment of single ASEAN visa in 2020 (Henderson, 2017; Ramos, Untong and Kaosa-ard, 2017) which facilitate traveling among ASEAN countries.

A negative risk that Thailand might face (as stated by 33 percent of the interviewees) is the lack of confidence on government stability and domestic peace. As with any other type of tourism, safety is crucial for the success of this segment (Cormany, 2010; Altin, Singal and Kara, 2011).

4.3.2 SWOT analysis

SWOT analysis assesses the internal issues (strengths and weaknesses) of the examined organization along with the external environmental issues (opportunities and threats). This approach is used to identify what elements assist the organization in accomplishing its objectives, and what obstacles must be overcome or minimized to achieve desired results.

To perform the SWOT analysis of the medical tourism in Thailand, the information from the primary sources (the in-depth interviews and the questionnaire) was combined with relevant secondary data published in various research journals, articles, websites and government reports.

In the remaining of the section, the internal environment issues (strengths and weaknesses) are going to be discussed first, followed by the explanation of external environmental issues as opportunities and threats.

a) The analysis of internal environmental

The analysis of internal environmental of the competitiveness of medical tourism in Thailand can be described as follow (see Table 4.3):

Table 4.3: The Result of SWOT Analysis of Thailand’s Medical Tourism

| | |
|--|--|
| <p style="text-align: center;"><u>STRENGTHS</u></p> <ul style="list-style-type: none"> - Highest number of hospitals accredited by JCI (42 hospitals). [S] - State-of-the-art medical facilities. [P, S] - Professional management [P]. - Lower cost of treatments. [P, S] - Well-trained medical staff, with friendly services. [P, S] - Attractive tourist destinations. [P, S] | <p style="text-align: center;"><u>WEAKNESSES</u></p> <ul style="list-style-type: none"> - Unclear image of medical tourism. [P] - No cooperation among medical tourism providers. [P] - Lack of cooperation among public agencies to enhance ‘the medical hub of Asia’ policy. [P,S] - Inadequate physicians’ production. [P, S] - Some medical personnel lacks of foreign language skills. [P, S] |
| <p style="text-align: center;"><u>OPPORTUNITIES</u></p> <ul style="list-style-type: none"> - Increasing trend of health consciousness in the world. [P, S] - High cost of treatment in some developed countries. [P, S] - High competitions that lead to the development of the medical personnel and facilities. [P] - Advanced medical technology, and high technology in telecommunication. [P, S] - Good economics condition of our neighboring countries. [P] | <p style="text-align: center;"><u>THREAT</u></p> <ul style="list-style-type: none"> - Political uncertainties. [P, S] |

Note: Primary data denoted with “P” and secondary data denoted with “S”

Source: Synthesized the information and data from the interviews with the administrators of private provider and the secondary data published in various sources.

Strengths

- Thailand has the highest number of hospitals accredited by JCI (Thailand 42, India 28, Malaysia 11, and Singapore 10) (Joint Commission International, 2017).
- Several private hospitals offer state-of-the-art medical facilities as Gamma Knife to the clients.
- 50 percent of the administrators in our interviews told that one of the strengths of medical tourism in Thailand was that most providers in Thailand were private hospitals with very professional management.
- Some medical treatments in Thailand, especially cosmetic surgery, have lower price than in the major competitors as Singapore (<http://medicaltourism.com>).

- Thailand has a well-trained medical staff (physicians, nurses, etc.) that provide friendly services. However, some administrators in our interviews (3 out of 12 of the interviewees) state that this advantage is disappearing as other countries devote more efforts to guarantee a friendly service.
- Thailand has many tourist attractions with international reputation. Many private hospitals are located in tourism destinations such as Pattaya, Phuket, and Samui. Then, medical tourists and their accompany people can undertake tourism activities as shopping, city tours, coastal activities, etc.

Weaknesses

- As it has already been explained, there is a lack of a clear medical tourism destination image in terms of treatments' specialization.
- 83 percent of our interviewees told that another weakness of Thailand's medical tourism was the lack of cooperation on marketing among providers. Each private hospital has their own marketing plan, and they compete among them, even if they belong to the same health care group (e.g. BDMS). Medical tourism providers tend to focus on domestic competition more than on the international competition. Other competitors, particularly Singapore, have public and private coordination for the promotion and development of their medical hub.
- Thai government intended to position Thailand as 'The medical hub of Asia' with four main authorities: MOPH, MOC, TAT, and BOI. However, there is no cooperation among these agencies.
- Inadequate physicians' production in the country to attend the increasing number of medical tourists (Noree, Hanefeld and Smith, 2016). Combined with strict conditions for foreign physicians to practice in Thailand, as mentioned above.

- Some of the administrators (75 percent) in our interviews insisted that a poor language skill (especially English) of some medical personnel was still a weakness of medical tourism in Thailand. Some participants mentioned that hospitals were facing this problem using translators in many foreign languages. However, if compare with our competitors such as Singapore, Malaysia, and India, Thai medical staffs still have low English skills.

b) The analysis of external environmental

The finding of the analysis of external environmental of the competitiveness of medical tourism in Thailand can be described as follow:

Opportunities

- There is an international increasing health -conscious population (VISA, 2014).
- Some developed countries have high cost of treatments when compared with developing countries (<http://medicaltourism.com>).
- The high competition between private hospitals in Thailand, and the international competition among Asian countries pushed hospitals to develop advanced medical personnel and facilities.
- Asian countries' advancement in medical technology will keep on attracting people from developed countries searching for cheaper price and effective treatments. Moreover, the ubiquity telecommunication technology in also beneficial for the medical tourism providers to gain access to more potential clients.
- All interviewed administrators expected that our neighboring countries as Myanmar, Lao PDR, or Cambodia will improve their economic condition after the opening of AEC.

Threat

- 33 percent of our interviewees indicate that political uncertainty is a threat to Thailand's medical tourism industry.

4.4 Asian Countries' Medical Tourism Competitiveness Index

This last section of the chapter presents an index to rank the competitiveness of the main medical tourism destinations in Asia. Based on our in-depth interviews with the administrator of private providers and the literature review, the selected countries for this analysis were: Singapore, Malaysia, and India. The indicators are generated from secondary data obtained from various sources such as World Bank, World Health Organization, and the Joint Commission International.

Competitiveness is a multi-dimensional relative concept (Spence and Hazard, 1988; Dwyer and Kim, 2003), which is applied to understand where a country's competitive position is weakest and strongest. There is no consensus on a single measurement method which can be applied to all cases (Hong, 2008). The measurement of tourism competitiveness in the past was usually based on the comparison of destination's capability to attract and satisfy tourists (Ritchie and Crouch, 2000; Hong, 2008). Hence, the competitiveness of each destination was determined both by tourism-specific factors and a much wider range of factors that might affect visitors (Ritchie, Crouch and Hudson, 2001; Enright and Newton, 2005).

Medical tourism consists of medical service and tourism (Bookman and Bookman, 2007). Then, this study will consider the potential advantages in each of these elements. Considering the above-mentioned competitiveness concepts, and the data limitation, this study will compare the differences in endowment and prices for both, the medical part and the tourism part, as present in Figure 4.3.

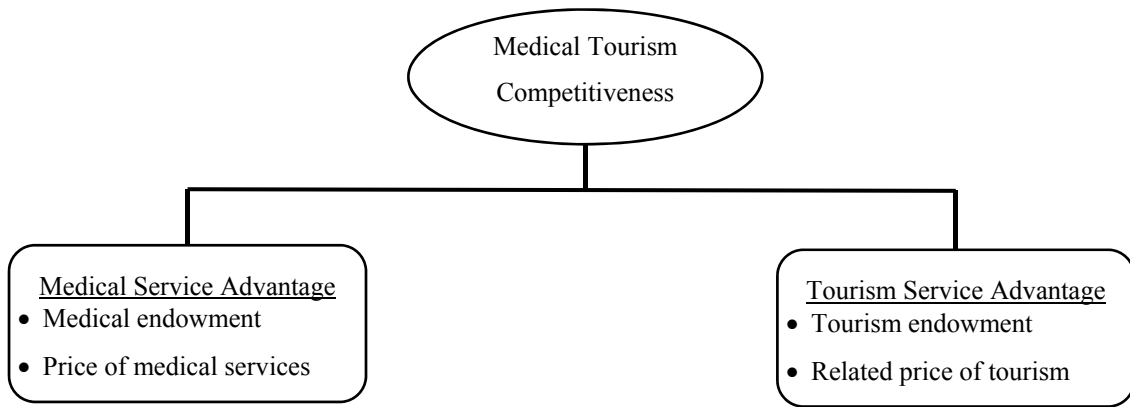


Figure 4.3: The Conceptual Framework of Medical Tourism Competitiveness Evaluation

Data used to develop the index was updated on May, 2017. The information of physician, nursing, midwifery, and dentistry density is obtained from World Health Organization. However, the year of reference is different for each country: Thailand (2010), Singapore (2013), Malaysia (2011), and India (2014). The information of purchasing power parity (PPP) is reported by the World Bank, and hotel price index is reported by World Economic Forum (data from 2015). While the remaining information, reported by different organizations, is from 2016.

Table 4.4 presents the suggested medical tourism competitiveness' components of Thailand and its major competitors: Singapore, Malaysia, and India. The information of medical endowment showed that Thailand has lower density of medical personnel (physician, nursing & midwifery, and dentistry) than Singapore, but higher density of dentistry than Malaysia and India. However, Thailand has more internationally certificated (JCI) hospitals than its competitors (about 4 times more than Singapore and Malaysia, and 1.5 times more than India). Regarding the medical treatments' price, Singapore has higher price than the other competitors in all treatments (except Rhinoplasty and Hip replacement); and India has the lowest price in several types of medical services.

Table 4.4: The Component of Medical Tourism Competitiveness of Thailand and Major Competitors in Asia

| Item | Thailand | Singapore | Malaysia | India |
|---|----------|-----------|----------|--------|
| 1. Medical endowment | | | | |
| - Physician per 1,000 population ¹ | 0.4 | 1.9 | 1.3 | 0.7 |
| - Nursing & midwifery personnel per 1,000 population ¹ | 2.0 | 5.7 | 3.4 | 2.0 |
| - Dentistry personnel per 1,000 population ¹ | 0.3 | 0.4 | 0.1 | 0.1 |
| - Number of hospital received JCI ² | 42 | 10 | 11 | 28 |
| 2. Price of medical services ³ | | | | |
| - Cosmetic surgery | | | | |
| • Breast implants | 3,500 | 8,400 | 3,800 | 3,000 |
| • Rhinoplasty | 3,300 | 2,200 | 2,200 | 2,400 |
| • Face lift | 3,950 | 4,400 | 3,550 | 3,500 |
| - Orthopedics | | | | |
| • Knee replacement | 14,000 | 16,000 | 7,700 | 6,600 |
| • Hip replacement | 17,000 | 13,900 | 8,000 | 7,200 |
| - Heart disease/ complex disease | | | | |
| • Heart bypass | 15,000 | 17,200 | 12,100 | 7,900 |
| • Angioplasty | 4,200 | 13,400 | 8,000 | 5,700 |
| • Spinal fusion | 9,500 | 12,800 | 6,000 | 10,300 |
| - Dental implant | 1,720 | 2,700 | 1,500 | 900 |
| 3. Tourism endowment ⁴ | | | | |
| - Tourist service infrastructure | 5.8 | 5.4 | 4.7 | 2.7 |
| - Natural resources | 4.9 | 2.4 | 4.1 | 4.4 |
| - Cultural resources & Business travel | 2.8 | 3.1 | 2.9 | 5.3 |
| 4. Related price of tourism | | | | |
| - Purchasing power parity ⁵ | 0.4 | 0.6 | 0.4 | 0.3 |
| - Hotel price index ⁴ | 102.0 | 116.0 | 85.2 | 84.5 |

Source: ¹ World Health Organization (retrieved May, 2017).

² <http://www.jointcommissioninternational.org/about-jci/jci-accredited-organizations/> (data are as of 2016, retrieved May, 2017).

³ <http://medicaltourism.com/Forms/price-comparison.aspx> (price are as of 2016, retrieved May, 2017).

⁴ World Economic Forum (2017).

⁵ the World Bank (retrieved May, 2017).

Regarding the tourism endowment index reported by the World Economic Forum, Thailand is outstanding in terms of tourist service infrastructure and natural resources, but inferior to other competitors in cultural resource & business travel. Whereas, the information of related price of tourism showed that Singapore has the highest price while India has the lowest price.

To compare the indicators between countries, all items were converted into a 1-to-7 scale (World Economic Forum, 2017) following the formula:

$$6 \times \left[\frac{\text{country score} - \text{sample minimum}}{\text{sample maximum} - \text{sample minimum}} \right] + 1$$

The minimum and maximum values are the lowest and highest scores of the four countries. If the indicators represent a negative concept (as medical treatment or hotel price), the formula was reversed to maintain the same interpretation: 1 = worst; 7 = best:

$$-6 \times \left[\frac{\text{country score} - \text{sample minimum}}{\text{sample maximum} - \text{sample minimum}} \right] + 7$$

These indicators are combined applying a simple average aggregation to form one single indicator.

Table 4.5 presents the medical tourism competitiveness index of the relevant destinations in Asia. The index takes values between 1 (lowest) to 7 (highest). The table shows that India ranks first in medical service advantage (scale = 4.3). It has the highest medical treatments' price competitiveness (scale = 6.5), but it has the lowest medical endowment advantage (scale = 2.2). Thailand appears as the country with lowest medical service advantage (scale = 3.4). Thailand has about 1.7 times lower medical endowment than Singapore. It also has lower medical treatment's price competitiveness than Malaysia and India. Then, we can conclude that compared with other Asian competitors, Thailand does not have an advantage in neither endowments, nor prices of medical services. Singapore has the advantage in medical service endowment. While, India and Malaysia have the advantage in medical services' price.

Table 4.5: Medical Tourism Competitiveness Index of Thailand and Major Competitors in Asia

Scale: 1 (minimum) – 7 (Maximum)

| Item | Thailand | Singapore | Malaysia | India |
|--|------------|------------|------------|------------|
| 1. Medical Service Advantage | 3.4 | 3.6 | 4.2 | 4.3 |
| <i>1.1 Medical endowment advantage</i> | 3.3 | 5.5 | 2.7 | 2.2 |
| - Density of physician | 1.0 | 7.0 | 4.5 | 2.3 |
| - Density of nurse & midwifery | 1.1 | 7.0 | 3.3 | 1.0 |
| - Density of dentist | 4.0 | 7.0 | 1.7 | 1.0 |
| - International accredited | 7.0 | 1.0 | 1.2 | 4.4 |
| <i>1.2 Price competitiveness in medical treatments</i> | 3.5 | 1.7 | 5.8 | 6.5 |
| - Cosmetic surgery | 3.8 | 3.0 | 6.6 | 6.6 |
| • Breast implants | 6.4 | 1.0 | 6.1 | 7.0 |
| • Rhinoplasty | 1.0 | 7.0 | 7.0 | 5.9 |
| • Face lift | 4.0 | 1.0 | 6.7 | 7.0 |
| - Orthopedics | 1.6 | 2.0 | 6.4 | 7.0 |
| • Knee replacement | 2.3 | 1.0 | 6.3 | 7.0 |
| • Hip replacement | 1.0 | 2.9 | 6.5 | 7.0 |
| - Heart disease/ complex disease | 4.4 | 1.0 | 5.3 | 5.4 |
| • Heart bypass | 2.4 | 1.0 | 4.3 | 7.0 |
| • Angioplasty | 7.0 | 1.0 | 4.5 | 6.0 |
| • Spinal fusion | 3.9 | 1.0 | 7.0 | 3.2 |
| - Dental implant | 4.3 | 1.0 | 5.0 | 7.0 |
| 2. Tourism Service Advantage | 4.8 | 2.0 | 4.9 | 5.8 |
| <i>2.1 Tourism endowment advantage</i> | 5.0 | 3.0 | 3.7 | 4.6 |
| - Tourist service infrastructure | 7.0 | 6.2 | 4.9 | 1.0 |
| - Natural resources | 7.0 | 1.0 | 5.1 | 5.8 |
| - Cultural resources & Business travel | 1.0 | 1.7 | 1.2 | 7.0 |
| <i>2.2 Price competitiveness in tourism</i> | 4.5 | 1.0 | 6.1 | 7.0 |
| - Purchasing power parity | 5.4 | 1.0 | 5.3 | 7.0 |
| - Hotel price index | 3.7 | 1.0 | 6.9 | 7.0 |
| Medical Tourism Competitiveness Index (MTCI) | 4.1 | 2.8 | 4.6 | 5.1 |

Source: Author calculation.

Regarding tourism service advantage, although Thailand has the highest tourism endowment (scale = 5.0), it ranks below India and Malaysia in tourism price competitiveness. Hence, Thailand is the third in tourism service advantage after these two countries.

The last row of Table 4.5 presents the aggregate medical tourism competitiveness index (MTCI), which shows that India is the leader in MTCI (scale = 5.1) due to more advantage in both medical and tourism price than the other three countries. Thailand is the third in MTCI (scale = 4.1) following India and Malaysia. Thailand only occupies the top position in terms of tourism endowment.

The information in Table 4.5 shows that each country has advantage in different aspects. Thailand has an advantage in tourism endowment; Singapore is the leader in medical endowment; India has price competitiveness in both medical and tourism services; Malaysia does not hold the first position in any of the items, but it has more price competitiveness than Thailand and Singapore.

Figure 4.4 presents the benchmarking of medical tourism competitiveness between Thailand and its major competitors in each aspect. This figure shows graphically the items in which there are competitiveness gaps or advantages. In this sense, it can be useful to define the elements that should be prioritized to enhance Thailand’s medical tourism competitiveness.

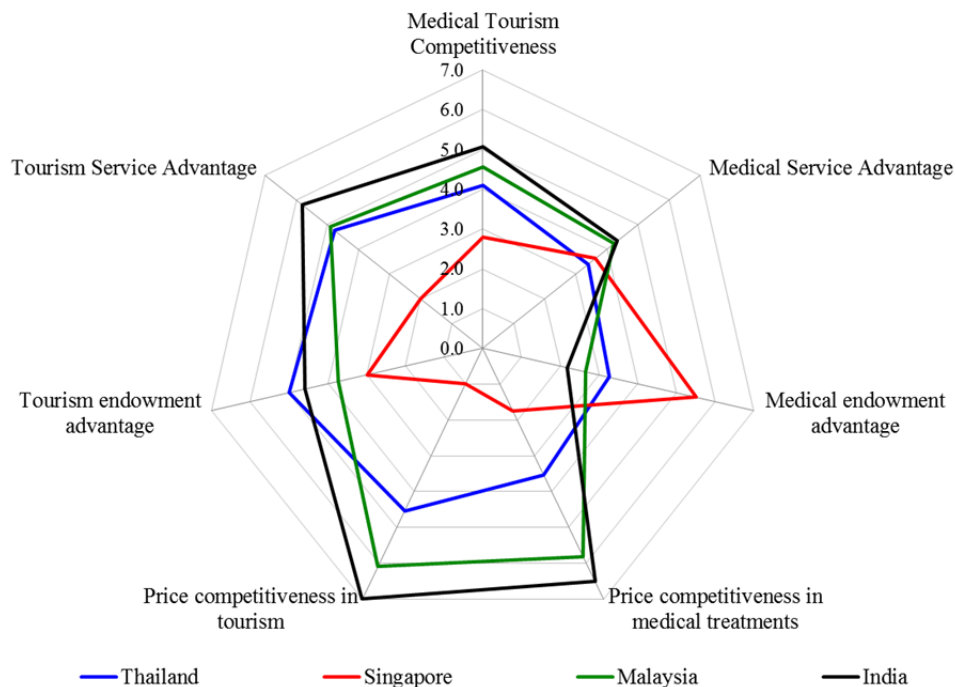


Figure 4.4: Benchmarking of Medical Tourism Competitiveness between Thailand and Major Competitors

As a summary of the analysis presented throughout this section, we found that each country has advantages in different aspects. These findings were consistent with the in-depth interviews with the administrator of private providers who thought that there was little competition between these four countries (Thailand, Singapore, Malaysia, and India). That is because each country has positioned itself differently based on their advantages. Singapore focuses on medical tourists seeking for advanced medical technology or specialized treatments such as neurosurgical procedures and heart transplant. They prefer to compete on high-quality medical services instead of price. Thailand is preferred by the group of medical tourists who focus on good quality medical services at reasonable prices, delivered with graceful and attentive service. For Malaysia, Islamic patients which have a similar culture are their main target. Most of the medical tourists in Malaysia are Indonesian. While, India uses their advantage in price (both medical and tourism price) to compete with the other countries. 83 percent (10 out of 12) of the administrators agreed that Thai medical tourism market faces more domestic competition than international competition. That is because all hospitals have the same group of potential customer (the marketing target is the same). While the medical tourism market in Asia is a niche market, where destinations position themselves differently, and attempt to attract the corresponding profile of clients.

4.5 Conclusions

This chapter presented an overview of the Thai medical tourism market, and its competitiveness compared with the major competitors in Asia as Singapore, Malaysia and India. A holistic approach is applied to analyze and synthesize the information from multiple sources (including primary and secondary data source). A case study approach from in-depth interviews was used to illustrate the market from the perspective of private providers. The determinants of competitive advantage ('Porter's diamond' model) and a SWOT analysis are applied to discuss Thailand's medical tourism competitiveness. Additionally, we developed a medical tourism competitiveness index (MTCI) that measures the endowment and price advantage of the elements of medical tourism, and is used for benchmarking the competitiveness between Thailand and its major competitors in Asia. The findings from this study will be beneficial for relevant agencies to set the policies and strategic plans to strengthen the competitiveness of medical tourism in Thailand, as well as to promote the future development of this segment.

Over the 20 years since the financial crisis in 1997, the private hospitals in Thailand have taken advantage of price competitiveness to attract foreign patients. Thai government also viewed medical tourism as a tool to stimulate its economic growth. In 2004, the government set the first strategic plan to promote Thailand as the medical hub of Asia, and launched the second strategic plan in 2014 for boost Thailand as a World-Class Health Care Provider. These result in a steadily growth of foreign patients in Thailand (around eight percent yearly growth during 2009-2015). Synthesizing the information from the interviews and the literature review it can be concluded that medical tourists are about ten percent of all foreign patients. The continuous development, the international standard of services, and the investment in technology and medical knowledge from private hospitals, explains that Thailand became one of the leading medical tourism destinations in Asia. The price and service (technology) gap are the two main reasons why most medical tourists go to Thailand, especially people from the developed and Middle East countries.

The results from diamond analysis found strong demand conditions mainly due to the long experience in providing medical service to the expatriate patients demanding high quality services. Factor conditions are good, with a clear commitment by the government to enhance its position as a tourist destination by combining it with the government's medical hub plan to provide the necessary infrastructure for the medical tourism cluster to growth. Similarly, medical tourism enables Thailand to diversify out of its existing strengths in related and supporting industries especially tourism. Regarding firm strategy and rivalry, Thailand has intense domestic and international competition which pushes current players to maintain and upgrade their services.

SWOT analysis showed that Thailand has significant strengths in terms of hospital standards, tourism & hospitality, and cost of treatments. However, Thailand has a weakness in the absence of a clear image of treatments' specialization, language limitations of medical personnel, and the lack of cooperation between related agencies to follow up the progress of the medical hub.

The results of medical tourism competitiveness index (MTCI) showed that India is the leader in medical tourism comparing with other competitors due to more advantage

in both medical and tourism price. Thailand is the third in MTCI following India and Malaysia. Thailand only occupies the top position in terms of tourism endowment.

Regarding the benchmarking of medical tourism competitiveness between Thailand and its major competitors in Asia, we found that each country has advantages in different aspects. Thailand has an advantage in tourism endowment while India has price competitiveness in both medical and tourism price. The same as Malaysia that is more competitive than Thailand and Singapore in medical and tourism prices. This information reveals the competitiveness gaps and advantages of each of these four countries.

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Chapter V

Conclusions

5.1 Research Motivation

Over the last decades, medical tourism has been increasing continually, and it is expected to grow at a 25 percent annual rate over the next ten years (Patients Beyond Border, 2017). Different elements are considered to contribute to its development: expansion of the aging society, paying more attention to health care, as well as the cost and technology gap between countries. Some Asian countries as Singapore, Malaysia, India, and Thailand have focused on developing medical tourism to generate revenue. Thailand is well-known as one of Asia's top medical tourism destinations (Connell, 2013; Alberti et al., 2014; Mary, 2014; Wong, Velasamy and Arshad, 2014; Ganguli and Ebrahim, 2017). The steadily growth of this tourism segment in Thailand derived from the development of private sector, government promotion policy, the outstanding of tourism attraction and hospitality, as well as premium healthcare services available at highly competitive prices. Moreover, Thailand has long been an international destination for medical tourism combining excellent quality and affordable costs (Patients Beyond Border, 2017).

Thailand is one example of successful medical tourism destinations, in both Asia and the world. However, it is facing major challenges as:

- *Intense domestic and international competition:* Ongoing expansion of medical tourism has attracted more investment in related business, particularly hospital business. There were investors from both Thailand and neighboring countries as Singapore and Malaysia interested in investing in hospital business within ASEAN countries like Cambodia and Myanmar (Department of International Trade Promotion, 2017) which cause an intense competition in medical tourism in this region.

- *Lack of research and information for policy decision-making:* Medical tourism is a multi-disciplinary service that combines tourism with health services. In the past, there were no agencies in Thailand that provide a clear and consistent definition of medical tourism or medical tourists. This causes inconsistencies and limitations on the available medical tourism information in Thailand. Together with such restrictions, individual participants in this segment also require a high degree of privacy. Hence, access to medical tourists' information was difficult, which consequently explains the lack of research about medical tourism in Thailand.

The literature review presented in previous chapters emphasized that the studies about medical tourism in Thailand with both, demand and supply approaches are relatively scarce. Moreover, the analysis of this tourism segment lacks a holistic approach, which uses a variety of data and analytical methods to understand the phenomenon of medical tourism occurring in Thailand. Only once the knowledge is generated, it would be possible to provide scientifically based policy recommendations for the development of medical tourism and the enhancement of its competitiveness.

With all the above in mind, this dissertation applied tourism economics knowledge to explain the phenomenon of medical tourism in Thailand based on the application of holistic approach and multiple data sources. This research proposed to:

- Provide a conceptual clarification of the segment under analysis. That required disentangling the typology of foreign patients before providing a definition and classification of medical tourists in Thailand. This objective is based on the empirical data obtained from the in-depth interviews with the administrators of major private providers and the survey of medical tourists in Thailand.
- Analyze the demand of medical tourism in Thailand with two main objectives. The first objective is to understand the characteristics and behavior of medical tourists in all the stages of their experience: decision-making (pre-service), on-site experience (during-service), and future behavior intention (post-service). The second objective is to model and forecast the number of medical tourists in Thailand with the constraint of data limitation. That last

situation implies a methodological challenge that was faced applying the appropriate forecasting techniques to obtain the accurate results.

- Analyze all the stages of the behavior of medical tourists in Thailand through modeling the causal relationship between motivation, experiences, and future behavior intention.
- Analyze the supply and competitiveness of medical tourism in Thailand to provide an overview of Thailand's medical tourism market and its competitiveness. The last element includes Thailand's benchmarking with its major competitors in Asia as Singapore, Malaysia, and India.

This dissertation applies a variety of techniques to analyze different data sources in the main chapters (II, III, IV):

- *Chapter II, demand analysis*: applied descriptive statistics to explain medical tourists' characteristics from a sample designed and implemented by the PhD candidate. Moreover, we applied the Chi-square and t-test with bootstrap to test different hypothesis. As the data from the survey have a non-normal distribution, we have to apply bootstrapping technique to find the confidence interval for the average value instead of presenting the standard deviation (SD). Regarding the number of medical tourists forecast, we applied and compared the Naïve 1 model, linear time trend analysis, and grey model [GM(1,1) and GM(1,1)-Alpha] to develop accurate forecasts under short historical data constrains.
- *Chapter III, customer behavior analysis*: applied a structural equation model (SEM) to investigate the causal relationship between motivation, experiences, and future behavior intention of medical tourists. Maximum likelihood with robust standard error (MLR) is used to estimate the coefficients as the data has a non-normal distribution.

- *Chapter IV, supply and competitiveness analysis:* This chapter, which applies a supply approach, is divided into two analyses: The first part uses case study approach to present a medical tourism market overview in Thailand, including elements such as the share of medical tourists from the total foreign patients, the reasons for choosing Thailand as destination, and which sources of information are used for decision-making. The second part used the ‘Porter’s diamond’ and ‘SWOT’ analysis to synthesizing the information and data from multiple sources, including primary and secondary data to analyze medical tourism competitiveness in Thailand. Moreover, we developed a medical tourism competitiveness index (MTCI) combining secondary data from different organizations. This part finishes benchmarking Thailand’s medical tourism competitiveness with the major competitors in Asia as Singapore, Malaysia and India.

5.2 Main Results and Contributions

This PhD thesis attempts to overcome the obstacles of the research in medical tourism in Thailand no matter an unclear definition of medical tourist or the limited of medical tourism data by constructing the primary data which can be used for the analytical in this study. As well as defining the definition of medical tourists used in this study. This thesis applied various concepts and analytical methods based on tourism economics knowledge to fulfill the understanding and explain the phenomenon of medical tourism in Thailand.

As already explained in the introduction, the thesis has been designed as three self-contained pieces of research. Hence, Chapters II to IV contain each a last section devoted to the description of the conclusions and policy implications derived from its research topic. For this reason, only a brief revision of the results already discussed in previous chapters will be presented in this section.

Chapter II: Demand Analysis of Medical Tourism in Thailand.

Defining clear definition of medical tourist and the cooperation from private hospitals in interviewing medical tourists let we knew that most respondents decide to receive medical services in Thailand before departing from their home country. The reasonable

price of treatments and cost of living, as well as the quality of medical services were main factors influencing them to undergo medical treatments in Thailand. Friend and relatives were an import source of information in decision-making while medical travel agent was the channel that most respondents used to contact with the hospital. Beauty service was the popular type of treatments that respondents used in Thailand. However, when compare in the same period, the length of stay and average expenditure of medical tourists were about two times higher than general tourists. Most of respondents felt that the experience of receiving medical services in Thailand was worthwhile with time and money paid, and in overall, they satisfied with this trip. Hence, they will recommend their friends and relatives and suggested the members of their family to go to Thailand if they need medical services.

Regarding the application of grey model with limited historical data of medical tourists, we found that the medical tourism demand in Thailand still growth rapidly. Therefore, the governments and medical tourism provider should prepare the local medical infrastructures to accommodate the expansion of medical tourism in the future, especially producing medical personnel, which is one of the weaknesses of medical tourism in Thailand.

Chapter III: Motivation, Experiences and Future Behavior Intention of Medical Tourists in Thailand

The complete model that covers all the stages of medical tourists' experience is also a methodological contribution.

Empirical study of the causal relationship between experience of using medical services and future behavior intention of medical tourists in Thailand (partial model) revealed that medical service experience received was the main factor affecting satisfaction and future behavior intention of medical tourists. While the causal relationship between motivation, experiences, and future behavior intention of medical tourists in Thailand (complete model) demonstrated that country motivation was the main factor affecting perceived value of medical tourists in Thailand while reasonable price of treatments and reasonable cost of living were the main indicators of country motivation. The hospital motivation which mainly captured by effectiveness of treatments was the major factor that affected medical service experience.

Regarding relevant policy implications, the results showed that Thailand should pay more attention on the reasonable price of medical treatments, good quality of service, and effectiveness of treatment because these are the importance indicators of medical service experience of medical tourists. While, medical tourism providers should focus on the adequate information of medical services and good environment of hospital with complete facilities to attract medical tourists to their hospitals. All of these will allow medical tourists to receive worthwhile experience, and increase satisfaction, which will be led to the positive future behavior intention.

Chapter IV: Supply Analysis and the Competitiveness of Medical Tourism in Thailand

The main contribution of this chapter is the applying holistic approach with data and information from multiple sources.

The results from diamond analysis found strong demand condition of Thailand's medical tourism which mainly due to the long experience in providing medical services to the expatriate patients demanding high quality services. Factor conditions are good, with availability of medical and tourism endowments to accommodate medical tourists. The intense competition between medical tourism providers in a country causes the development in both medical personnel and medical technology. The aging society and the opening of ASEAN Economic Community (AEC) may cause the increase in the number of medical tourists which is the good opportunity for medical tourism in Thailand.

The SWOT analysis showed that Thailand has significant strengths in terms of hospital standards, tourism & hospitality, and cost of treatments but has the weaknesses in the absence of a clear image of treatments' specialization, and language limitations of medical personnel.

Finally, when compare with main competitors in Asia, Thailand has an advantage in tourism endowment and can respond to the demand of medical tourists that need the quality medical services with reasonable price and attentive service. However, Thailand has more domestic competition than the competition with other medical tourism destinations in Asia. That is because each private hospital has the same group of customer while the medical tourism market in Asia is the niche market. Each medical tourism

destination in Asia has positioned themselves differently, and then they have different target clients.

As a final summary derived from this PhD thesis, the policy recommendations for accommodate the opportunity and challenge of medical tourism in Thailand in the future are increasing the production of health care professionals, especially physicians and nurse as well as integrating the cooperation of the relevant agencies involved in the promotion of medical tourism. In addition, an agency that has the responsibility to collect and report the data of medical tourism should define the clear definition of medical tourist and have the efficient collecting method to provide an accurate data. This accurate information of medical tourists will be beneficial for the researcher and may increase the number of research in this tourism segment. Moreover, medical tourism providers can take advantage of this information in planning their marketing plan.

5.3 References

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Appendix A

Structured of the Interview

1. Medical tourism in the opinion of the operator and comment on the “Medical Hub” policy.
2. Policies, regulations and laws as a major barrier to enhance medical tourism and health tourism in Thailand.
3. Competitiveness of Thailand’s medical tourism.
 - Should be considered at the micro (country) or macro level (hospital).
 - Thailand's key competitors in Asia (regional) and the global market.
 - The advantages and competitiveness of Thailand’s medical tourism such as price, quality, technology, etc.
 - Strengths and reason why our customers (foreign patient) select to receive medical treatment in Thailand.
4. Potential and opportunities of the medical tourism in Thailand (present and future).
 - Guidelines for the strengthening and development of medical tourism in Thailand.
 - Quality of the medical treatment in Thailand that enhance the potential and opportunity.
 - Position of Thailand’s medical tourism as opposed to our competitors in Asia and the world.
 - Strengths, weaknesses, opportunities and threat (SWOT).
5. Situation of Thailand’s medical tourism.
 - Competitive situation of Thailand’s medical tourism both within and between countries.

- Customer and market of Thailand's medical tourism (medical tourist or expatriate). Is it different from the main competitor?
 - Behavior of medical tourist in Thailand.
6. Trends of medical tourism in Thailand (in next 5 and 10 years).
- The growth of medical tourism in Thailand and the world.
 - Target group.
 - Liberalization of ASEAN and impact.

Appendix B

Questionnaire

| | |
|---|---|
| Questionnaire: Behavior and Experience of Medical Tourists in Thailand | Date...../...../ 2013 No..... Interviewer..... Place..... |
|---|---|

| | |
|---|--|
| <u>To be filled by medical staff.</u> | |
| 1. Medical services: | <input type="checkbox"/> Health check-up <input type="checkbox"/> Dentistry <input type="checkbox"/> Beauty <input type="checkbox"/> Specialized treatment/ serious disease _____ |
| 2. Nationality of patient: | <input type="checkbox"/> Japanese <input type="checkbox"/> Australian <input type="checkbox"/> Russian <input type="checkbox"/> Burmese <input type="checkbox"/> Omani <input type="checkbox"/> Emirati <input type="checkbox"/> Other (pls. specify) _____ |
| 3. (a) Gender: | <input type="checkbox"/> Female <input type="checkbox"/> Male (b) Age _____ years old |
| 4. Have you stayed in Thailand more than 12 months or do you plan to stay more than 12 months? | <input type="checkbox"/> Yes (End of questionnaire, thank you) <input type="checkbox"/> No (If no, please continue) |
| 5. Have you received this medical treatment due to accidents? | <input type="checkbox"/> Yes (End of questionnaire, thank you) <input type="checkbox"/> No (If no, please continue) |

To be filled by medical tourist.

1. Your main occupation (**single answer**):

- Expatriate/Diplomat in other country (pls. specify country) _____
 Public servant Company employee Professional (lawyer/doctor/etc.) Self-employed
 Student Retired Housewife Other (pls. specify) _____

2. When did you decide to receive medical services in Thailand?

- Prior to departure from my home country After arriving in Thailand

3. What is the main purpose of this trip? (**Please tick X**)

| Completely for medical services | Mostly for medical services | Equally for medical services & tourism | Mostly for tourism | Completely for tourism |
|---------------------------------|-----------------------------|--|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Have you had any experience in using medical service outside your home country before this trip?

- No (**go to question 6**) Yes. Where? (pls. specify) _____; _____;
 _____; _____;

5. What type of medical services did you receive in the last trip? (**single answer**)

- Dentistry Treatment Cosmetic Beauty Skin treatment Surgery/ other (pls. specify) _____
 Specialized treatment/serious disease (pls. specify) _____

6. What is the total duration of this trip in Thailand _____ (#) days Don't know depend on treatment result
 - Length of the treatment and recuperation _____ (#) days - Length of tourism _____ (#) days

7. What is the main reason which makes you choose to receive medical service outside your home country?

- Low cost of treatment No waiting lists Better quality/reputation of medical treatment in Thailand

8. If you had not chosen to come to Thailand, what would be the country that you would be interested in traveling to seek medical service? (**rank first 3 countries using 1, 2, 3 to answer**)

- Singapore Malaysia India
 Other (pls. specify) 1. _____ 2. _____ 3. _____

9. Which is the source of information that made you decide to receive medical services in Thailand? (**rank 1, 2, 3 if there is more than one**)

- Referred to come to Thailand by hospital government medical assistance company
 Medical travel agency Friends or relatives who have used medical service previously
 Hospital websites International exhibition/Road show
 Advertisements in the airport Others (pls. specify) _____

10. Which is the channel that you used to connect with the hospital in Thailand? (**single answer**)

- Walk in Medical travel agency
 Booking through hospital website Other (pls. specify) _____

11. Which are the important factors for choosing medical services in Thailand?

| Items | Level of agreement with the statement | | | | | | |
|--|---------------------------------------|---|---|---|---|---|---|
| | Lowest → Highest | | | | | | |
| 1. Thailand has reputation as an international medical hub. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Similar culture. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Reasonable price of treatments. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Travel from country of residence is cheap and convenient. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Reasonable cost of stay in Thailand. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Possibility to combine with tourism activities. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Items | 12. Please indicate the importance you give to each of the following items while receiving medical services in Thailand. | | | | | | | 13. Please indicate the satisfaction you give to each of the following items while receiving medical services in Thailand. | | | | | | | | | |
|--|--|---|---|---|---|---|---|--|---|---|--------|---|---|---|--|--|--|
| | Lowest | | | → | | | | Highest | | | Lowest | | | → | | | |
| 1. Quality of the services. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| 2. Capabilities of doctors | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| 3. Effectiveness of treatments. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| 4. Staff communicative skill. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| 5. Atmosphere and facilities. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| 6. Adequate information of medical services. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |

14. Please indicate your level of agreement with each of the following items

| Items | Level of agreement from your experience | | | | | | |
|--|---|---|---|---|---|---|---|
| | Lowest | | | → | | | |
| 1. Considering your income and the cost of treatment, medical services in Thailand were good value for money. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Considering the waiting lists in my home country and the value of my time, medical services in Thailand were a good use of my time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The good opportunities to combined medical services with tourism activities in the same trip were an added advantage of this trip. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

15. Please indicate the satisfaction from your experience about medical services in Thailand.

| Items | Level of satisfaction from your experience | | | | | | |
|--|--|---|---|---|---|---|---|
| | Lowest | | | → | | | |
| 1. Overall, I am satisfied. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Overall, my satisfaction is greater than my expectation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. My satisfaction with medical services in Thailand is greater than in my home country. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The service-oriented staff in Thailand was beyond my expectation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

16. Please indicate your level of agreement with the following items.

| Items | Level of agreement from your experience | | | | | | |
|--|---|---|---|---|---|---|---|
| | Lowest | | | → | | | |
| 1. If needed, I would like to receive medical services in Thailand. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I will recommend medical services in Thailand to my friends and relatives. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. If some members of my family needed medical services, I would recommend Thailand to them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

17. If any, which type of medical services is more likely that you would receive in Thailand in the future? (single answer)

- Dentistry { Treatment Cosmetic }
 Beauty { Skin treatment Surgery/ other (pls. specify) _____ }
- Specialized treatment/serious disease (pls. specify) _____

18. Did any friends/relatives accompany you in this trip? No Yes. How many people? _____ persons

19. Did you and (or) your companions undertake any tourism activities in Thailand?

- No (go to question 21) Yes, only me Yes, only my companions Yes, both my companions and I

20. What type of tourism activities did you and (or) your companions undertake? (more than one answer is possible)

- Spa Beach Shopping City tour Other (pls. specify) _____

21. Who pay for the medical services costs in Thailand?

- Yourself Insurance company Other (pls. specify) _____

22. How did you arrange this trip to Thailand?

- Self-arranged (go to question 24) Package tour: How much did it cost? _____ (currency) _____

23. What expenses were included in package? (Please tick X)

- Cost of Travel Cost of medical treatment Cost of accommodation Other (pls. specify) _____

24. Total expense for this trip in Thailand _____ (currency) _____

For cost of medical treatment _____ (currency) _____

25. Approximate personal income before pay tax per year: _____ (currency) _____

26. Approximate family income before pay tax per year: _____ (currency) _____