ANALYSIS OF INTERNATIONAL TOURISM DEMAND FOR CAMBODIA'S TOURISM

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MASTER OF ECONOMICS

GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
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หัวข้อวิทยานิพนธ์	การวิเคราะห์อุปสงค์การท่องเที่ยวระหว่างประเทศที่มีต่อการท่องเที่ยวประเทศกัมพูชา	
ผู้เขียน	นายจันทา ฮอ	
ปริญญา	เศรษฐศาสตรมหาบัณฑิต	
คณะกรรมการที่ปรึกษา	อ.ดร.นลิตรา ไทยประเสริฐ	อาจารย์ที่ปรึกษาหลัก
	รศ.ดร.คมสัน สุริยะ	อาจารย์ที่ปรึกษาร่วม

บทคัดย่อ

งานศึกษานี้เป็นงานวิจัยที่ใช้การวิเคราะห์เชิงปริมาณในการศึกษาอุตสาหกรรมท่องเที่ยวของประเทศกัมพูชาโดยใช้วิธีการทางเศรษฐมิติในการศึกษาอุปสงค์การท่องเที่ยวของนักท่องเที่ยวต่างชาติโดยมีวัตถุประสงค์ในการศึกษา 2 ประการ ได้แก่ การศึกษาถึงปัจจัยที่มีอิทธิพลต่อการตัดสินใจเดินทางเข้ามาท่องเที่ยวยังประเทศกัมพูชาของนักท่องเที่ยวต่างชาติ และประการที่สองคือ การพยากรณ์จำนวนนักท่องเที่ยวต่างชาติทั้งในระยะสั้นและระยะยาว

การวิเคราะห์ปัจจัยทางเศรษฐกิจและที่มิใช่ปัจจัยทางเศรษฐกิจที่มีอิทธิพลต่อความต้องการเดินทางท่องเที่ยวมายังประเทศกัมพูชานี้ได้ใช้วิธี fixed-effect และ random effect ในการวิเคราะห์ข้อมูลภาคตัดขวางช่วงยาวจากนักท่องเที่ยวต่างชาติจำนวน 26 ประเทศในช่วงเวลาตั้งแต่พ.ศ.2539–2555 โดยได้แบ่งกลุ่มประเทศที่ทำการศึกษาตามที่ตั้งทางภูมิศาสตร์ได้แก่ อาเซียน เอเชีย โอเชียเนีย ยุโรป อเมริกาเหนือ และกลุ่มที่รวม 26 ประเทศทั้งหมดเข้าไว้ด้วยกัน

ผลการศึกษาพบว่าผลิตภัณฑ์มวลรวมประชาชาติเฉลี่ยต่อหัวของนักท่องเที่ยวต่างชาติในปีก่อนหน้ามีผลกระทบเชิงบวกอย่างมีนัยสำคัญต่อจำนวนนักท่องเที่ยวต่างชาติที่เข้ามายังประเทศกัมพูชาโดยเฉพาะอย่างยิ่งนักท่องเที่ยวที่มาจากลุ่มประเทศอาเซียนโอเชียเนียและอเมริกาเหนือ นอกจากนั้นแล้ว นักท่องเที่ยวจากกลุ่มประเทศโอเชียเนียก็มีความอ่อนไหวต่อการเพิ่มขึ้นของค่าครองชีพในประเทศกัมพูชาน้อยกว่า ซึ่งตรงข้ามกับนักท่องเที่ยวจากกลุ่มประเทศยุโรปซึ่งมีความยืดหยุ่นมากกว่า เป็นที่น่าสนใจว่านักท่องเที่ยวจากกลุ่มประเทศยุโรปและโอเชียเนียมีความอ่อนไหวต่อการเปลี่ยนแปลงระดับราคาในประเทศกัมพูชาในทิศทางที่ตรงข้ามกัน กล่าวคือ หากระดับราคาในประเทศกัมพูชา

สูงขึ้น จำนวนนักท่องเที่ยวจากยุโรปจะเพิ่มขึ้นเล็กน้อย ในขณะที่นักท่องเที่ยวจากกลุ่มประเทศโอเชียเนียจะลดลงเล็กน้อย

ในส่วนของตัวแปรด้านค่าใช้จ่ายในการเดินทางนั้นพบว่า มีผลกระทบเชิงบวกต่อจำนวนนัก ท่องเที่ยวจากกลุ่มประเทศเอเชีย โอเชียเนีย และยุโรป แต่มีผลกระทบเชิงลบต่อนักท่องเที่ยวจากทวีปอเมริกาเหนือ เนื่องจากระยะทางระหว่างเอเชียและกัมพูชาไม่ได้เป็นอุปสรรคต่อการเดินทางเข้ามาท่องเที่ยวยังประเทศกัมพูชา ส่วนนักท่องเที่ยวจากทวีปยุโรปและโอเชียเนียอาจเลือกเดินทางผ่านมายังประเทศเพื่อนบ้านที่สะดวกต่อการเดินทางเข้ามายังกัมพูชา แต่การไม่มีเที่ยวบินตรงมายังกัมพูชาน่าจะเป็นสาเหตุหนึ่งที่ตัวแปรนี้ให้ผลทางลบต่อกรณีของนักท่องเที่ยวจากทวีปอเมริกาเหนือ

วิกฤติการเงินโลกในช่วงปีพ.ศ.2551–2552 (D1) มีผลกระทบเชิงลบต่อนักท่องเที่ยวจากกลุ่มทวิปอเมริกาเหนือ ซึ่งน่าจะเป็นผลเนื่องมาจากปัญหาทางเศรษฐกิจอย่างรุนแรงที่เกิดขึ้นกับภูมิภาคนี้ได้ทำให้ชาวอเมริกาเหนือเดินทางท่องเที่ยวลดลง วิกฤตการณ์ทางการเงินในเอเชียในช่วงปีพ.ศ.2541–2542 (D2) ได้ส่งผลต่อการลดลงของจำนวนนักท่องเที่ยวที่เดินทางไปยังกัมพูชาจากกลุ่ม 26 ประเทศและกลุ่มนักท่องเที่ยวจากอเมริกาเหนือ แต่กลับพบว่าจำนวนนักท่องเที่ยวจากทวีปยุโรปกลับเพิ่มขึ้น ส่วนนักท่องเที่ยวจากเอเชียและอาเซียนนั้น แม้ผลที่ออกมาจะไม่มีนัยสำคัญทางสถิติ แต่ค่าสัมประสิทธิ์ของตัวแปรก็ยังเป็นลบ ซึ่งงสอดคล้องกับสมมุติฐานที่ตั้งไว้ว่านักท่องเที่ยวจากสองภูมิภาคนี้น่าจะลดลงยามเกิดวิกฤตเศรษฐกิจในเอเชีย เหตุการณ์การก่อการร้ายในวันที่ 11 กันยายน 2544 ซึ่งมีผลในช่วงระหว่างปีพ.ศ.2544–2545 (D3)ได้ส่งผลทางลบต่อกลุ่มนักท่องเที่ยวจากทวีปอเมริกาเหนือแต่กลับเป็นบวกต่อกลุ่มนักท่องเที่ยวจากโอเชียเนียและยุโรป ผลที่ได้นี้บ่งชี้ว่าความเชื่อมั่นในความปลอดภัยของชาวอเมริกาเหนือลดลงหลังจากเหตุการณ์การโจมตีในวันที่ 11 กันยายน ทำให้ยอดนักท่องเที่ยวจากทวีปอเมริกาเหนือไปยังกัมพูชานั้นลดลง นอกจากนี้ การเกิดรัฐประหารในไทยในปีพ.ศ. 2549 (D4) ไม่มีผลต่อจำนวนนักท่องเที่ยวที่เดินทางไปยังกัมพูชา

ปัญหาความขัดแย้งของไทยและกัมพูชาในประเด็นเรื่องเขตแดนในช่วงปีพ.ศ.2551–2554 (D5) กลับส่งผลดีต่อจำนวนนักท่องเที่ยวต่างชาติที่มายังกัมพูชาที่มาจากโอเชียเนียและอเมริกาเหนือ ซึ่งอาจอธิบายได้ว่าข้อพิพาทที่เกิดขึ้นกลายเป็นช่องทางการประชาสัมพันธ์ประเทศอย่างไม่เป็นทางการของกัมพูชา ส่วนการระบาดของโรคซาร์สในเอเชียในปีพ.ศ.2546 (D6) กลับส่งผลกระทบเชิงบวกต่อนักท่องเที่ยวจากกลุ่ม 26 ประเทศและทุกกลุ่มภูมิภาคของการศึกษา แสดงให้เห็นว่ากัมพูชาซึ่งเป็นประเทศที่ปลอดภัยจากการแพร่ระบาดของโรคซาร์สได้รับโอกาสจากวิกฤตที่เกิดขึ้นในขณะนั้น

ในส่วนของปัญหาทางการเมืองภายในของกัมพูชาเองในปีพ.ศ.2540–2541 และพ.ศ.2546 (D7) ได้ส่ง

ผลกระทบเชิงลบต่อนักท่องเที่ยวจากกลุ่ม 26 ประเทศ โอเชียเนีย ยุโรป และอเมริกาเหนือ ซึ่งแสดงให้เห็นว่าความขัดแย้งภายในประเทศนั้นส่งผลในทางลบต่ออุตสาหกรรมการท่องเที่ยวเป็นอย่างยิ่งการเกิดสึนามิในประเทศญี่ปุ่นและในทวีปเอเชียตะวันออกเฉียงใต้ (D8 และ D9) ซึ่งแม้จะเป็นเหตุการณ์ที่น่าสลดใจต่อประเทศที่ได้รับผลกระทบ กลับส่งผลกระทบในเชิงบวกต่อการเดินทางท่องเที่ยวมายังกัมพูชาจากนักท่องเที่ยวทั่วทุกภูมิภาค

การตกลงออกนโยบายวีซ่าเดียวแต่ท่องเที่ยวได้ห้าประเทศในอาเซียน (กัมพูชา ลาว พม่า ไทย และเวียดนาม) ซึ่งเริ่มต้นในปีพ.ศ.2555 (D10) ได้ส่งผลกระทบเชิงบวกต่อนักท่องเที่ยวจากกลุ่มประเทศโอเชียเนีย แสดงว่านักท่องเที่ยวต่างชาติโดยเฉพาะจากโอเชียเนียได้รับประโยชน์จากวีซ่าประเภทนี้เพราะสามารถวางแผนที่จะมาเที่ยวยังหลายประเทศในอาเซียนได้ง่ายขึ้น ส่วนการยกเว้นวีซ่าให้กันระหว่งประเทศในกลุ่มอาเซียนในช่วงปีพ.ศ.2549–2555 (D11) กลับไม่มีผลต่อจำนวนนักท่องเที่ยวต่างชาติที่เดินทางมายังกัมพูชา

ในส่วนของวัตถุประสงค์ที่สองของการศึกษาได้ทำการพยากรณ์จำนวนนักท่องเที่ยวต่างชาติที่เข้ามายังประเทศกัมพูชาระหว่างปีพ.ศ.2557–2560 โดยใช้วิธีการวิเคราะห์สถานการณ์ (scenario analysis) โดยได้ทำการแบ่งสมมติฐานออกเป็น 3 สถานการณ์ได้แก่ สถานการณ์ที่เลวร้ายที่สุด สถานการณ์ปกติ และสถานการณ์ที่ดีที่สุด โดยการพยากรณ์ได้อยู่บนพื้นฐานของค่าสัมประสิทธิ์ที่มีนัยสำคัญทางสถิติของตัวแปรอิสระทั้งสามตัวคือ ผลิตภัณฑ์มวลรวมประชาชาติเฉลี่ยต่อหัวของนักท่องเที่ยวต่างชาติในปีก่อนหน้า ระดับราคาค่าครองชีพในประเทศกัมพูชา และค่าใช้จ่ายในการเดินทางที่หาได้จากการศึกษาในส่วนแรก

ในกรณีของสถานการณ์ที่เลวร้ายที่สุดพบว่าจำนวนนักท่องเที่ยวต่างชาติที่เข้ามายังประเทศกัมพูชาจากกลุ่มประเทศอเมริกาเหนือจะลดลงประมาณร้อยละ 55 รองลงมาคือกลุ่มประเทศอาเซียนคือร้อยละ 40 ในขณะที่นักท่องเที่ยวจากกลุ่มประเทศโอเชียเนียจะลดลงเพียงร้อยละ 0.12 ซึ่งเป็นอัตราการลดลงที่ต่ำที่สุด

ส่วนในกรณีของสถานการณ์ปกติพบว่า จำนวนนักท่องเที่ยวต่างชาติจากกลุ่มประเทศอาเซียน ยุโรป เอเชีย และโอเชียเนียต่างก็มีอัตราการเติบในทางบวกที่ประมาณร้อยละ 8-9 ทั้งสิ้น แต่นักท่องเที่ยวจากกลุ่มประเทศอเมริกาเหนือกลับมีอัตราการเติบโตต่ำที่สุดคือที่ประมาณร้อยละ 5 เท่านั้น

ส่วนในกรณีของสถานการณ์ที่ดีที่สุดนั้น พบว่านักท่องเที่ยวต่างชาติที่เข้ามายังประเทศกัมพูชาในอัตราที่สูงที่สุดคือจากกลุ่มประเทศเอเชีย คือประมาณร้อยละ 41 ส่วนอัตราที่ต่ำที่สุดคือจากกลุ่มประเทศอเมริกาเหนือซึ่งอยู่ที่ร้อยละ 6 เท่านั้น

ผลการศึกษานี้น่าจะเป็นประโยชน์ต่อการวิเคราะห์ถึงความเหมาะสมของนโยบายการท่องเที่ยวในปัจจุบันของประเทศกัมพูชา นอกจากนี้ข้อเสนอแนะเชิงนโยบายจากงานศึกษานี้น่าจะสมารถเป็นแนวทางให้กับรัฐบาลประเทศกัมพูชาในการกำหนดและพัฒนายุทธศาสตร์การท่องเที่ยวของกัมพูชาให้เติบโตได้อย่างเข้มแข็งและยั่งยืนต่อไป

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ABSTRACT

To the best of the author's knowledge this paper fills an epistemological gap as there has never been a research paper published using quantitative analysis for Cambodia's tourism industry. This paper contains an econometric analysis of international tourism demand for Cambodia's tourism for two main objectives. Firstly, to understand factors influencing international tourists' decision-making in coming to Cambodia. Secondly, to forecast short- and long-term international tourist inflows.

The 17 year period (1996–2012) is the time frame used to scrutinize the degree to which determinants of economic and non-economic factors influenced international tourist arrivals to Cambodia. Using fixed-effect and random-effect models, six sets of panel data from 26 countries has been analyzed. For the purpose of the study, these countries are grouped geographically into ASEAN, Asia, Oceania, Europe, North America, and a 26-country group (all countries combined).

In regards to the first objective of the study, the results reveal the GDP per capita of the tourist countries of origin in the previous year has a significant and positive effect on international tourist arrivals into Cambodia, especially tourist arrivals from ASEAN, Oceania, and North America. Tourists from Oceania are less sensitive to an increasing cost of living in Cambodia. This is opposite to tourist arrivals from Europe wherein price elasticity is positive. It is of interest that tourist groups from Europe and Oceania show sensitivity to price changes in Cambodia in a vice-versa way, i.e., if relative price increases in Cambodia then tourist arrivals from Europe increase slightly while tourist arrivals from Oceania decrease slightly.

Transportation cost has a positive impact on tourist arrivals from Asia, Oceania, and Europe, but has a negative impact on tourist arrivals from North America. The distance between Asia and Cambodia is logically not an obstacle for discouraging tourists from travelling to Cambodia, while tourists from Europe and Oceania might take a trip to Cambodia via neighboring countries where it is convenient and easy to get into Cambodia. The lack of long haul flights direct to Cambodia could be a contributing factor for the case of North American tourists.

The global financial crisis in the period of 2008–2009 (D1) had a negative impact on tourist arrivals to Cambodia from North America. This is likely due to hardship caused by the crisis having a more telling effect on the people in this region which in turn discouraged them from travelling to Cambodia. The financial crisis in Asia in the period of 1998–1999 (D2) discouraged tourists from travelling to Cambodia from the 26-country group and from North America. Paradoxically, number of tourists from Europe increased during this period. The coefficients from ASEAN and Asia are not significant for this variable, though they are negative, which is in line with expected results that the crisis might had an impact upon some countries of ASEAN and Asia. The September 11 attack in the U.S. during 2001–2002 (D3) had a negative influence on tourist arrivals from North America, but a positive effect on tourists from Oceania and Europe. This result indicates that American sentiment was low right after the September 11 attack which, discouraged Americans from travelling abroad, but the event seems to have no impact on tourist arrivals from Oceania and Europe. In addition, the Thai military coup in 2006 (D4) had no significant effect on tourist arrivals to Cambodia.

The Cambodia-Thai border dispute in the period of 2008–2011 (D5) had a positive effect on international tourist arrivals to Cambodia from Oceania and North America. The result suggests the dispute became an unexpected advertising channel for the Cambodia tourism industry which encouraged tourists to Cambodia. The SARS epidemic in Asia in 2003 (D6) had a positive effect on tourist arrivals from the 26-country group and from every region. This illustrates that Cambodia, which is a relatively safe place from SARS, attracted tourists from other Asian countries with had SARS outbreak.

The political instability and deadlock in Cambodia in 1997–1998 and 2003 (D7) had a negative impact on tourist arrivals from the 26-country group, Oceania, Europe, and North America. The internal conflicts in Cambodia could be harmful to the tourism industry as they discourage tourists, especially those from long-distance countries. The tsunami in Japan and in Southeast Asia (D8 and D9) had a positive effect on international tourist arrivals to Cambodia from every region. Although the events were horrific for the affected countries, they benefited Cambodia's tourism industry. Tourists may have changed their plans from travelling to the impacted countries and travelled to Cambodia instead.

The single visa entry scheme for the five ASEAN countries (Cambodia, Laos, Myanmar, Thailand, and Vietnam) which commenced in 2012 (D10) had a significant and positive effect on tourist arrivals from Oceania. This suggests that international tourists, especially from Oceania, utilize the benefit of a single visa because they can plan to visit several countries in ASEAN using the same visa. The visa exemption among the ASEAN countries in the period of 2006–2012 (D11) had no significant effect on tourist arrivals to Cambodia.

In regards to the second objective of the study, future international tourist arrivals to Cambodia during the period of 2014–2017 are predicted using scenario analysis. The three main scenario assumptions are the worst-case scenario, normal-case scenario, and the best-case scenario. These scenarios are determined by using three statistically significant independent variables, i.e., Gross Domestic Product Per Capita in the previous year ($GDPPC_{t-1}$), Relative Price (RP) and Transportation Cost (TC).

The worst-case scenario results predict a significant decline in international tourist arrivals to Cambodia from North America of approximately 55 percent, followed by 40 percent of tourists from ASEAN and with tourist arrivals from Oceania showing the lowest negative growth rate of only 0.12 percent. Numbers of tourist arrivals from Asia and Europe are predicted to show a downturn of 27 percent and 28 percent, respectively, in the worst-case scenario.

In the normal-case scenario, numbers of tourist arrivals from ASEAN, Europe, Asia, and Oceania are predicted to have a positive growth rate of around 8 percent to 9

percent. The number of tourist arrivals from North America is predicted to have the lowest growth rate of around 5 percent.

In the best-case scenario, the number of tourist arrivals from Asia is predicted to have a growth rate of 41 percent (the highest), while that from North America is predicted to be only 6 percent (the lowest).

Results from the study could be valuable for Cambodia's policy makers to investigate the suitability of current tourism policies of Cambodia. In addition, the policy recommendations from the study could provide a guideline for the Cambodian government to formulate new development strategies for Cambodia's tourism industry for more vigorous and sustainable growth of this industry.

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CHAPTER 1

INTRODUCTION

1.1 Principle and Rationale of the Study

Tourism is one of the world's fastest growing industries. Tourism can contribute significantly to economic growth in both developed and developing countries. The tourism industry directly employs more than 98 million people around the world, i.e., around 3 percent of all jobs. The job expansion in travel and tourism is forecast to average about 1.9 percent per year over the next decade; in comparison to a 1.2 percent annual growth rate forecast over the same period for the total number of jobs in the global economy (Turner & Sears, 2013). Moreover, tourism is the world's largest export earner, generating around US$ 1.3 trillion and representing 6 percent of the world's exports in 2013. Earnings from international tourist arrivals climbed up 5 percent to US$ 1.087 billion from US$ 1.035 billion in 2012. This figure is forecast to grow to US$ 1.8 billion international tourists in 2030. (UNWTO, 2013).

Tourism in Cambodia started to flourish in the 1965s. It was seriously damaged in the 1970s and 1980s by civil conflict and the genocidal policies of the Pol Pot era which destroyed all tourism related systems in the country. The industry turned around only after Cambodia had gained peace through the 1991 Paris Peace Agreement (Chheang, 2009). Since then Cambodia's tourism industry has played an important role as an engine of its economic growth. It is the second largest profit-earning industry for the Cambodian national account after the garment industry. Tourism accounted for 12 percent of the Cambodian economy in 2013 (World Travel & Tourism Council, 2013). In the period 1993 to 2013 tourist arrivals increased dramatically to an average of 20 percent annually. In 2004, international tourists contributed 50.5 percent toward Cambodia's Gross Domestic Product (GDP). This figure increased to 24.4 percent in 2012. Cambodian revenue from international tourism has increased from $ 2.21billion in 2012 to $ 2.55 billion in 2013 (Kong & Horth, 2013). Additionally, according to the World and Tourism Council report in, Cambodia's tourism industry has created around

1.45 million direct jobs in 2011. The number of jobs is estimated to rise to 1.5 million in 2012 and 1.95 million 2022 (World Travel & Tourism Council, 2013).

In 2013 most of the international tourists came to the Cambodian tourism market from the following six regions: ASEAN (43.5%), East Asia (28.8%), South Asia (0.7%), Oceania (3.6%), Europe (16.6%) and the North Americas (6.3%). From 1993 to the present there are 26 countries which have a potential effect on Cambodia's GDP. There are Brunei, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand, Vietnam, China, Japan, Korea, Taiwan, India, Australia, New Zealand, Belgium, Denmark, France, Germany, Italy, Netherland, Norway, Switzerland, The United Kingdom, Canada and USA (Kong & Horth, 2013). All these countries have been selected for this study.

Cambodia recognizes the tourism industry as a key economic driver in facilitating Cambodia to achieve Cambodia's rectangular strategy and the United Nations Millennium Development Goals (MDG). The Cambodian government has put great effort into attracting greater numbers of international tourists by improving the available tourism system through the continual development of infrastructure such as roads, bridges, airports, river and sea harbors and power and water supply. The government has undertaken the development of more innovative tourist places in an effort to increase the lengths of stay of international tourists. National tourism strategy plans and policies have been ratified to stimulate economic growth through tourism. Furthermore, the government has authorized the ministry of tourism to cooperate with private sectors, NGOs and international development partners to more efficiently put plans and policies into effect.

The kingdom of Cambodia is recognized world-wide as having a pristine coastline bordering vast natural attractions rich in cultural heritage sites containing alluring and stunning ancient temples of an exotic cultural and historical nature. It offers a uniquely fascinating scenario of ancient mysteries; especially Angkor Wat temple. The kingdom's gruesome era from the Khmer Rouge period in the 1970's adds considerably to the many attractions for tourists. These elements have captured the curiosity of millions of international tourist from all corners of the world. Travelers visit Cambodia for holiday, business, leisure, adventure or a combination of all four. There is a plethora of travel

magazines and newspapers listing Angkor Wat amongst the top most beautiful temples in the world and as one of the 52 most attractive places in 2014 for travelling. It has the distinction of being one of the most enchanting places for discovering in the world. However with the growing international tourist's role fueling the Cambodian economy, there is very little attention paid to the investigation of factors which properly define the, there is very little attention paid to the investigation of factors which properly define the

tourist's decision to visit Cambodia and nothing in the way of predictions regarding the future flow of international tourists to Cambodia. These factors have been examined in some Asian countries as well as in many western and European countries. To be more precise, an increasing number of studies have struggled to understand international tourism behavior through the demand models as exemplified in the papers of Gonzalez and Moral (1995), Divisekera (2003), Bernadina and Algieri (2006), Lim (1997), Habibi, Rahim, and Chin (2008), Lim et al. (2009), Jintranun et al. (2011), Aslan et al. (2008), Garin-Munoz and Montero-Martin (2007), Ouerfelli (2008), Song et al. (2003), Allen et al. (2009), Kusni et al. (2013), Asemota and Bala (2012), Dritsakis (2004), and Lyssiotou (2000).

Furthermore, there are also many papers that have used econometric methodologies for forecasting international tourism demand in destination countries. Recent examples employing time series models include Torra and Claveria (2014), Chu (2004), Calantone (1998), R.Andrawis (2011), T.Coshall (2009), Chu (2009), Faulkner (1995), Law and Goh (2002), S.Nell and Mello (2005), Pai et al. (2014), Preez and Witt (2003).

As the role of the tourism industry in Cambodia has expanded there has been scant attention paid to the investigation of factors affecting international tourists' decisions to visit Cambodia. To the best of the author's knowledge there is an epistemological gap as there has never been a research paper published using quantitative analysis for Cambodia's tourism industry. This paper is supposedly the first to perform an econometric analysis of international tourism demand for Cambodia's tourism for two main reasons. Firstly, in order to understand factors influencing international tourists' decision-making in coming to Cambodia and secondly to forecast short and long term international tourist inflows. The following two crucial questions have been designed to simplify and clarify the study:

1) *What are vital determinant factors that influence international tourism demand in Cambodia; both in the short run and long run?*
2) *How many international tourist arrivals can be expected to visit Cambodia during 2014 to 2017, based on scenarios analysis?*

The result of this study will help in the development of the international tourism industry in Cambodia.

1.2 Purpose of the Study

This study has two main purposes. Firstly, it aims to identify the economic factors influencing the behavior of international tourism demand in Cambodia and secondly to examine these factors short and long term impacts using panel data for the 17 year period (1996–2012).

Two types of independent variables are used in this study; economic and non-economic factors. Income, tourism price, transportation cost between the country of origin and destination country and other factors are incorporated through the application of international tourism panel data models based on 'fixed-effect' and 'random-effect' models. The intention is to investigate their effects and impacts on international tourism arrivals in Cambodia, which is considered as the dependent variable. Secondly, this model will be utilized to forecast the tourism arrivals to Cambodia based on scenario analysis for the long term, i.e., the period from 2014 to 2017.

1.3 Advantage of the Study

This study will benefit investors, travel agent companies, the Ministry of Tourism in Cambodia, and the Cambodian government. The results should provide previously unavailable information for the Ministry of Tourism in Cambodia therefore enabling an increased effectiveness in strategic planning for the promotion of Cambodia as a tourist destination.

Another advantage is the study will create a knowledge base of factors that affect international tourism demand in Cambodia for the ministry to stimulate tourism growth as well as providing a reference source for further studies on tourism forecasting.

1.4 Scope of the Study and Data Collection

The scope of this study focuses on the following:

1 The data is obtained over the period from 1996 to 2012 from the database software (CEIC Databases) at the faculty of Chiang Mai original data sources include World Bank, National Institute of Statistic of Cambodia, Financial statistic data (IMF), U.S Energy Information Administration, and the online Website DistantFromTo.

2 The international tourist arrivals in this study derive from 26 countries (countries of origin) covering 6 main regions (see Table1 for members in each region), over the 17 years period 1996–2012.

Table 1: International tourist arrivals to Cambodia from 26 countries of origin

Regions	Countries
ASEAN (8)	Brunei, Indonesia, Laos PDR, Malaysia, the Philippines, Singapore, Thailand, and Vietnam
East Asia (4)	China, Japan, South Korea, and Taiwan
South Asia (1)	India
Oceania (2)	Australia and New Zealand,
Europe (9)	Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, The United Kingdom, and Switzerland.
North America (2)	Canada and the U.S

3 The variables in this study are as follows:

3.1) Dependent variable: This variable is the number of tourist arrivals to Cambodia which is used as a proxy for the international tourism demand.

3.2) Independent variables

3.2.1) Income: This variable is the gross domestic product per capita (GDPPC) as a constant term at time (t–1).

3.2.2) Relative Price: This variable represents the cost of goods and services purchased by international tourists in Cambodia. It is a ratio of consumer price index (CPI) of the destination country (Cambodia) over the CPI of each origin country

adjusted for differences in exchange rates between the currencies of the origin and destination countries (Lim, 1997).

$$\text{Relative Price} = \frac{\text{CPI(Destination)}}{\text{CPI(Country of Origin)}} * \frac{EX_j}{EX_k}$$

Where, EX_j is the exchange rate of the origin country's currency per USD, and E_k is the exchange rate of Cambodia's Riel per USD.

3.2.3) Transportation cost (TC): This variable refers to the total travel cost from the country of origin to Cambodia. Transportation cost is measured by multiplying the distance from each origin country (Distance_i) by the average annual price of a barrel of oil (AAPO), according to A.Rodriguez et al. (2012). The transportation cost formula can be written as following:

$$\text{TC} = \text{Distance}_i * \text{AAPO}$$

3.2.4) Non-economic factors: Non-economic factors refer to unpredictable events that influence the tourism demand. There are a lot of external factors which can affect international tourism demand in Cambodia but because of its unreachable data the targeted selection non-economic factors is created in the name of dummy variables. Those dummy variables are:

D_1 = the global financial crisis during 2008–2009,

D_2 = the financial crisis in Asia in the period of 1998–1999,

D_3 = the September attack in the U.S. during 2001–2002,

D_4 = the Thai military coup in 2006,

D_5 = The Cambodian-Thai border dispute during 2008–2011,

D_6 = the SARS epidemic in East Asia in 2003,

D_7 = the political instability and political deadlock in Cambodia in 1997–1998 and 2003,

D_8 = the tsunami in Japan during 2011–2012,

D_9 = the tsunami in Southeast Asia during 2004–2005.

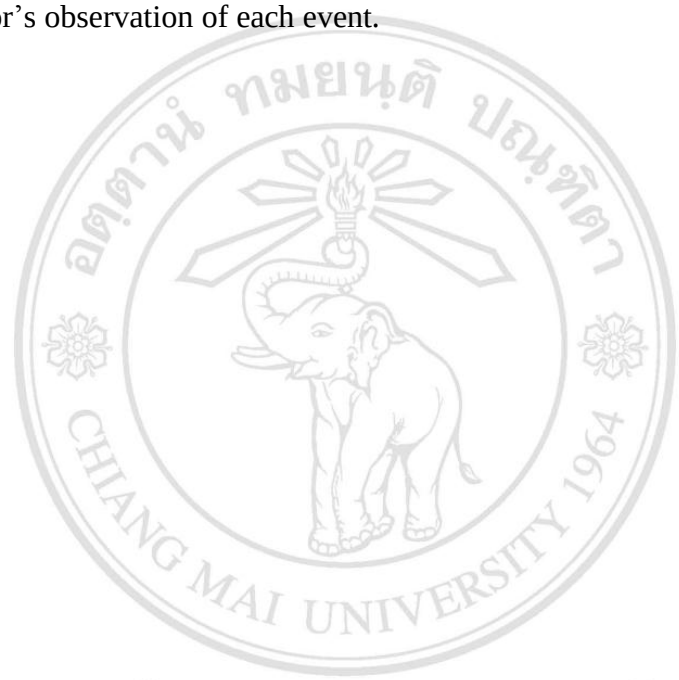
3.2.5) Tourism Policies: Tourism policies are taken into account as a tool to attract the interest of tourists through the provision of tourist information, entertainment events and tourist oriented policies which create a comfortable

environment for tourist's access to their destination. Two main policies used as dummy variables in this study are:

D_{10} = the single visa entry schemes to enter five ASEAN Countries (Cambodia, Laos, Myanmar, Thailand, and Vietnam), started in 2012,

D_{11} = the visa exception among ASEAN countries in 2006–2012,

All the dummy variables are from headline news and message alert at the official website of Human Right watch in Cambodia. The periods used in the dummy variables are from the author's observation of each event.



CHAPTER 2

LITERATURE REVIEW AND THEORETICAL BACKGROUND

2.1 Theoretical Background

2.1.1 Classical demand theory

International tourism demand studies usually include demand theory in the framework of demand elasticity because tourists maximize tourism products through demand function. In addition to the neoclassical theory, the theoretical Lancastrian model is used to explore an individual's consumption of specific features. From this consumers attain satisfaction and utility providing a tourism demand approach. Tourism demand is basically influenced by income, tourism price, exchange rate and transportation cost to the extent whereby changes in the demand result from each of the variables. This is predominantly for policy makers. It is useful to analyze the effects of these variables in detail.

Studies using econometric models mostly interpret results in a form of demand elasticity which can be defined as the percentage change of endogenous variable (number of tourist arrivals) respective to the exogenous variables (the demand determinants). An elasticity of greater than one means the demand is elastic. Modifications to demand for tourism goods and services responds fractionally more than the movement of each of the explanatory variables. Similarly, if income rises in the country of origin (with other variables remaining constant), the effects of all the relevant tourism business activities and tourist destinations are likely to be positive. Therefore, increasing income reflects an increase of tourism purchasing power in the destination country. Likewise the effect of increasing income on the demand for most goods and services positively correlates to income; referred to in the study as normal goods. On the contrary it is possible, despite income increases in the country of origin, which tourism demand slows down in the destination country when inferior goods and services are

provided (Sookmark, 2011). On the other hand, if the elasticity is less than one, it implies that demand is inelastic. It represents that the demand for tourism products responds fractionally less than the changes of manipulating variables (Sookmark, 2011).

1) Income Effect

Income represents the amount of consumers' purchased goods and services at the targeted tourism destination which is a matter of research seeking to measure the effects of income changes on tourism demand. The measure of the effect of income changes is calculated in the form of income elasticity which is the ratio of the percent change with respect to the change in disposal income as shown in the following equation (Sookmark, 2011):

$$E_y = \frac{\%\text{change in tourist demand}}{\%\text{ change in disposable income}}$$

The sign of income elasticity is expected to be positive for all goods and services because the demand for basic goods and services should be income inelasticity while luxury items (an item that raises fractionally more with growing income) should be elasticity as the special case of foreign travel; see Divisekera and Kulendran (n.a) and Monoz (2007). This finding leads to conclude that the estimated income elasticity of demand is positive and greater than one supported by Crouch (1994).

However, if the destination country is extremely affected by cost factors, given the availability of many destinations from which to choose, international tourism arrivals can become sensitive to price based on their personal income. Therefore income elasticity is properly a negative, denoting an inferior tourism destination (Divisekera & Kulendran, n.a), and (Chadee & Miezkowski, 1987).

2) Price effect

Price effect is more complex than the income effect. Price in this study refers to tourism price which is the amount of money the tourists pay in the destination country (e.g. accommodation, recreation, entertainment, foods and transportation).

The tourism price/relative price is the price between destinations and/or the price differences between destination country and country of origin. Moreover, international tourism demand the exchange rate is normally the leader causing price of tourism product changes. If the income changes then the price of tourism products change. This can be measured as the price elasticity of demand is formulated from the following (Sookmark, 2011):

$$E_p = \frac{\%\ \text{change in quantity of tourism product demanded}}{\%\ \text{change in tourism product price}}$$

According to the standard law of demand in microeconomics, the product will be diminished in the future, hence E_p will be negative, i.e., there is an inverse relationship between the price of a product and demand for that product. Elastic demand indicates that the demand is sensitively responsive; exceeding the percentages of any price changes, while price inelasticity implies the demand is relatively not responsive to demand. Cross price elasticity is defined by Sookmark (2011) as shown below:

$$E_{pc} = \frac{\%\ \text{change in demand for product A}}{\%\ \text{change in price of product B}}$$

Where A and B are close substitutes and one might expect E_{pc} to be positive and probably> 1 (Sookmark, 2011).

2.1.2 The Almost Ideal Demand System

Apart from the classical demand theory which has been included in tourism demand studies, the Almost Ideal Demand System (AIDS) theory has recently been popularly used in consumer demand studies (including those related to tourism demand) as stated in Wu et al. (2012). This is because of its advantages over other models in consumer demand studies, specifically the double logarithmic system, the linear expenditure system, and the indirect addilog model (Thamos, 1993). It is capable of analyzing the demand for different tourism goods and services and their relevance. The theory allows the cross-price elasticity among various tourism goods and services to be estimated directly (Wu, Li, & Song, 2012). Furthermore, it can be applied in tourism demand studies to explore the demand for international tourist arrivals across several destinations; regarded as the tourism product within the demand system, the natural

characteristic of the destination (either luxury or necessity) and their relationships (either substitutes or complements) which are identified in the demand elasticity analysis.

The AIDS model has originally developed from the economic demand theory with its two main assumptions of homogeneity and symmetry considered in the demand system (Wu, Li, & Song, 2011). This model provides more accurate outcomes for demand elasticity compared with single-equation demand models (Wu, Li, & Song, 2012).

In the current existing empirical tourism demand literature the AIDS model has been introduced in two different categories with two crucial purposes. The first category, the AIDS model (EC-AIDS), has been introduced to analyze the short-term dynamics of demand system for various tourist destinations as seen in the studies of Cortes-Jimenez et al. (2009), Durbarry and Sinclair (2003), and Li et al. (2004). The second category of AIDS applications in tourism is employed to analyze the tourists' budget allocation amongst several tourism product categories including food, holiday spending, transportation and shopping (Wu, Li, & Song, 2012). This has also been seen in detail at the work of Divisekera (2009) and Fujii et al. (1985).

1) Basic AIDS Model

The first feature of the AIDS model was proposed by Deaton and Muellbauer (1980) in order to capture the demand for a number of goods and services. This model is given a formula as following:

$$W_i = \alpha_i + \sum_j \gamma_{ij} \mathrm{Ln} p_j + \beta_i \mathrm{Ln} \frac{x}{P} + \sum_K \varphi_{ik} \mathrm{dum}_k + \varepsilon_i$$

Where

W_i = the budget share of the ith category of tourism goods and services (here, n categories of goods and services constitute a complete demand system).

P_j = the price of jth tourism product

x = the total expenditure on all tourism goods and services in the system.

P = the aggregate price index

$\frac{x}{P}$ = the real total expenditure per capita

kth Dummy = the captures the effect of a one-effect event

$\alpha_i, \gamma_{ij}, \beta_i, \varphi_{ik}$ = the parameters

ε_i = the error term

The model is commonly studied in the completed system which is required to add up budget share into the unity with the implication that $\sum_i \alpha_i = 1, \sum_j \gamma_{ij} = 0$, and $\sum_i \gamma \beta_i = 0$. According to Deaton and Muellbauer (2008), once the dependent variables (budget shares) are set to add up to unity, any problems within the residual variance-covariance matrix can be fixed it by omitting an equation from the system in the estimation. Its coefficients are then calculated later on dependent on the adding-up rule. For the time being, two basic restrictions such as homogeneity and symmetry are proposed on the parameters due to the demand theory within AIDS framework. These restrictions are also imposed in the other versions of the model as discussed below:

2) Error-Correction AIDS (EV-AIDS) Model

EV-AIDS model is the dynamic version of AIDS model that is employed in preference to the basic AIDS model in modelling tourists' consumption behavior. This is because the EC-AIDS has the ability to reflect continuous adjustments in tourist's consumption behavior in connection with new equilibriums of the demand system in line with Wu et.al (2011). The formula of EV-AIDS is as follow:

$$\Delta W_{i,t} = \alpha_{i,t} + \lambda \mu_{i,t-1} + \sum_j \gamma_{ij} \Delta \ln P_{j,t} + \beta_i \Delta \ln \frac{x_t}{p_t} + \sum_k \varphi_{ik} \, dum_k + \varepsilon_{i,t}$$

Where

Δ = the difference operator

$\mu_{i,t-1}$ = the estimate residual term from the basic AIDS model. It is the error correction term that measures the adjustment of the decision errors made in the previous period.

All variables in both models have to be in integrated order of one level and a co-integration relationship must exist between them thus supporting the adoption of the EC-AIDS model. See Cortes-Jimenez et al. (2009) and Li et.al (2004).

2.2 Literature Reviews

Many analysis tools have been used in analyzing the tourism industry around the world, namely the classical multivariate regression, advanced modern econometric approaches (such as VAR model), vector autoregressive model, ARMAX model, system-of equation approach, autoregressive distributed lag model, co-integration test, error-correction model, generalized method of moment (GMM) model, novel hybrid system, simple time-series models (such as naïve, simple autoregressive, smoothing exponential, and trend curve analysis) and advanced time-series models (such as seasonal ARIMA and conditional volatility models. Numerous variables (explained and explanatory) were selected in international tourism demand studies based on limited data.

2.2.1 Dependent and Independent Variables

2.2.1.1 Dependent Variable

The growth of tourism demand studies has attracted academic and professional researchers to draw various dependent variables, such as tourist arrivals, expenditures, departures, tourism receipts, travel demand, travel export/import, tourist visits, average length of stay, nights spent at tourist accommodation, number of night and tourism demand. These are clearly found in Chaiboonsri et al. (2010), Song et al. (2009), Lee et al. (1996), Lim (1997), Sr and R.Croes (2000), Han et al. (2006), Alegre and Pou (2006), Gokvali (2007), and Allen et al. (2009). Moreover, Lim (1997) reviews 100 published empirical tourism studies, in which he finds that the most dependent variable used is tourism arrivals and/or departure (51%) followed by tourist expenditures and/or receipts (49%), while travel exports and/or import (7%), length of stay (6%), nights spent at tourist accommodation (4%) and other variables (2%).

2.2.1.2 Independent variables

Past studies have endowed explanatory variables to explain the demand of international travel. Income, tourism prices or relative prices, transportation cost, exchange rate, substitute price and other qualitative factors are the most popular variables used in the international tourism demand. In his review of international tourism demand models, Lim (1995) classifies independent variables into the following categories: income (84%), relative price/tourism prices (73%), transportation costs

(55%), dynamics (26%), exchange rate (25%) competing destinations/goods (15%), seasonal factors (14%), marketing expenditure (7%), migration (5), business travel/ trade (5%) trend (25%), and qualitative factors (66%), other (27%). Similarly in detailed works of Witt and Witt (1995), Song and Witt (2000), and Louviere (2000).

Much of the data Cambodia mentioned in part 2.2.1.1 and 2.2.1.2 is unavailable. Available data includes: dependent variables; international tourist arrivals, tourist receipts, average length of stay and for independent variables; income, tourism price or relative prices, transportation cost and exchange rate. Time periods for tourist receipts and average length of stay data are insufficient for studying at the percent.

Income uses GDP per capita in constant term at time (t–1) as a proxy is relative price CPI in the country of origin and destination country. Transportation cost is measured by multiplying the distance from each origin country to Cambodia by the average annual price of a barrel of oil. GDP per capita, CPI of all selective countries (including Cambodia) and exchange rates are collected from the database software (CEIC databases) at the faculty of economics, Chiang Mai. The average annual price of crude oil and the distance between each of country of origin to Cambodia are obtained from the U.S. Energy Information Administration and DistantFromTo website (http://www.distancefromto.net). The distance from/to is measured from the middle point of each origin country to the middle of Cambodia. International tourism arrivals for each origin country are taken from Ministry of Tourism in Cambodia. Furthermore the non-economic factors have been considered as main determinant factors that prestige international tourism demand in the form of dummy variables. Therefore, there is enough reason to choose the variables in this study as reviewing more detailed below:

1) International tourism arrivals

International tourism arrivals are usually measured by the number of international tourists (country of origins) visiting the destination country.

2) Income

Tourism income of each origin country is the foremost variable to explain foreign travel demand. Many empirical studies suggest it is very necessary to the

tourism demand function as reported by Lim (1997), Song and Witt (1997) and Dritsakis (2004). In regard to the demand theory, the relationship between income and quantity demand can be either positive or negative based on the type of goods or services under consumer's consideration. Customers will consume more goods and services when their income increases and vice versa; consumers consume less goods and services when their income decreases. However, tourism is commonly considered as luxury goods (Schiff & Becken, 2011).

The common popular variables as proxies for income are gross domestic product (GDP), gross national product (GNP), private consumption per capital, GDP per capita, disposable income and total expenditure per capita. See Lim (1997) and Asemota and Bala (2012).

3) Price

Price, in the case of tourism, particularly represents two main pricings.Namely the cost of living in a destination country (tourism price/relative price) and cost of travelling from each of origin country to a destination country (transportation cost). These costs are very difficult to compute. It is also difficult to find data from any specific database sources. Tourism price is the most critical concern with its influence on tourists' decision-making to visit the destination countries (Gonzalez, 1995). The tourism price is the price of a bundle of goods and services bought by tourists yet most countries do not have the tourism price index for goods and services purchased by tourists. Hence, consumer price index is very commonly substituted as a proxy in many papers, according to Asemota and Bala (2012), Song et al. (2009), Song et al. (2009), Song et al. (2003), Lee et al. (1996).

Due to Dritsakis (2004) and Lim (2004), relative price is measured by the consumer price index (CPI) of the destination divided by the consumer price index (CPI) of the origin country.

4) Exchange Rate

In the recent reviews of comprehensive tourism demand studies, exchange rate is becoming a vital determinant to which both public and private tourism planners pay much attention. It is usually seen in many academic papers including

Garin-Munoz and Montero-Martin (2007) and Thompson and Thompson (2010). Swift fluctuations of exchange rate have noticeably more potential effect on foreign travelers than changes in a country's price level. A weak value in the destination country relative to the currency of origin country permits international tourists to increase their consumption in the destination country. Hence, an increasing demand will be expected by the destination country.

5) Transportation Cost

Similarly, transportation cost has been included in many published and practical papers to interpret international tourism demand. These can be seen in the works of A.Rodriguez et al. (2012), Divisekera and Kulendran (n.a), and Song et al. (2010). Tourists will generally take into account travel costs from their home to the targeted tourist destination. The tourists' decision-making usually thinks about the cost of their travel based on their level of income. High prices of transportation offered by airlines are exposed to tourist' decision making. This study includes this variable for exploring the determinant factors impacting on international tourism behavior relative to Cambodia as a destination choice.

6) Non-Economic Factors

Similar to the above variables related to common usage in tourism demand studies, non-economic factors are widely called as special factors. These variables refer to any unpredictable events that cause tourists to cancel or delay their trip immediately, despite the marketing promotion and marketing campaigns from the destination country. Examples are natural disaster, crime, terrorism, political instability, visa exception, tourism main event at the tourism places and so on. Data for all of these variables is unavailable. Therefore these variables are often used as dummy variables in order to capture the effect on tourist behavior. Non-economic factors and/or special factors are found in detail in the work of Ouerfelli (2008), Song et al. (2003), Song et al. (2010), and Song, Witt and Jensen (2010).

2.2.2 Methodologies

2.2.2.1 International Tourism Demand Using Time Series models

There are plenty of international tourism demand studies which use time series models in their analysis. For example, Lim et al. (2009) use the ARMAX model to investigate the dynamic relationship between tourism demand and real income of Japan for New Zealand and Taiwan. The outcomes indicate that international travel is positively correlated to income of the origin country.

Ouerfelli (2008) studies the topic "Co-integration analysis of quarterly European tourism demand in Tunisia" to identify empirical variables (such as prices, income factors, and supply factors as independent variables) which impact on tourists' decision-making on spending their time in Tunisia by using co-integration analysis and error correction model. The study finds that a large elasticity magnitude may be a reflection of tourism as a luxury goods bought by European countries with the supply factor having a significant effect on the tourists' decision-making in visiting Tunisia. In his study, Dirtsakis (2004) uses co-integration analysis to investigate changes in the long-run demand for tourism to Greece by German and British tourists. Dirtsakis (2004) finds the long-run relationship among macroeconomic variables (such as income in origin countries, transportation cost, exchange rates, and tourism price in Greece) determine German and British tourism demand to Greece.

Asemota and Bala (2012) study the topic "Modelling tourism demand in Japan using co-integration and error correction model" to critically explore the long-run and short-run tourism demand in Japan from mainly five western countries (U.S.A, Canada, U.K, Germany, and Australia) during 1962–1992 by employing co-integration and error correction model. The result reveals that GDP per capita in the origin country is the most significant factor influencing the inflow of international tourism arrivals to Japan. The price elasticity and price of tourism in alternative destinations is found to be significant in some cases with tourists from U.S.A and Canada showing the highest devotion to tourism in Japan among the five western countries considered.

Sr and R.Croes (2000) study in the topic "Evaluation of demand US tourists to Aruba" employ time series data using linear and double log-linear models to study the demand of U.S. tourists to Aruba. The study reveals the effects of income dominate those of price and exchange rates. In general the U.S. tourists appeared to be highly

sensitive to income variables and inelastic with respect to price. The exchange rate variable is not significant.

Gonzalez and Moral (1995) research in the topic "Analysis of the international tourism demand in Spain" investigate international tourism demand in Spain in the form of a structural time series model. The two popular explanatory variables of income index and price index (tourism price and substitute price) are used in the study. The paper presents that both Spanish tourism markets are very sensitive to changes in relative prices and income of the origin countries.

Song et al. (2003) studies the topic "The determinants of international tourism demand in Hong Kong" and employs the general-to-specific modelling approach to investigate the important economic factors influencing international tourism demand in Hong Kong from 16 origin countries. The study shows that the cost of tourism in Hong Kong, the economic condition of the origin countries, the cost of substitution in competing destination and word of mouth effect are the most important factors influencing Hong Kong's tourism industry.

Habibi, Rahim, and Chin (2008) research in the topic "United Kingdom and United States tourism demand in Malaysia" using co-integration analysis. They propose three main manipulated variables (income in the origin countries, tourism prices in Malaysia and transportation cost between country of origin and destination country) to find the UK and the US tourism demand for Malaysia. The study finds that a long-run equilibrium exists among the variables selected (income of origin countries, tourism prices in Malaysia and transportation cost between country of origin and destination country). They also find tourists seem to be strongly sensitive to tourism prices. In addition to the studies mentioned above there are plenty of international tourism demand studies using time series models, e.g. A.Nelson et al. (2011), Alegre and Pou (2006), Lim and McAleer (2001), Lim and McAleer (2003), Chan et al. (2005), Uysal and Crompton (1984), Akis (1998), and Var et al. (1998).

The summary of international tourism demand using time series model is shown below in the Table 2:

Table 2: Summary of international tourism demand using time series model

Author(S)	Topic	Variables	Model Using Time Series	Results
Lim et al. (2008)	" ARMAX Modelling of International Tourism Demand"	-Dependent: tourist arrivals -Independent: real GDP, lagged tourist arrival, lagged real GDP	-ARMAX Model	-International tourists are positively correlated to income of the origin country.
Ouerfelli (2008)	" Co-Integration Analysis of Quarterly European Tourism in Tunisia"	-Dependent: tourist arrival -Independent: income, price, supply factor	-Co-Integration Analysis -Error Correction Model	-A large elasticity magnitude may be a reflection of tourism as luxury goods bought by international tourists.

Table 2: Summary of international tourism demand using time series (continued)

Author(S)	Topic	Variables	Model Using Time Series	Results
				-The supply factor has significant effect on the tourists' decision-making to visit in Tunisia.
Asemota and Bala (2012)	"Modelling Tourism Demand in Japan Using Co-Integration and Error Correction Model"	-Dependent: Tourist arrivals -Independent: real income per capita, tourism prices, Transportation cost, exchange rate	-Co-integration analysis -Error correction model	-GDP per capita in the origin country is the most significant factor that influences the inflow of visitors into Japan.
Sr and R.Croes (2000)	" Evaluation of Demand U.S Tourists to Aruba"	-Dependent: tourist arrivals -Independent: income, exchange rate, relative price	-Consumer demand theory -Linear or double log-linear model	-U.S tourists are highly sensitive to income and inelastic with tourism price. -International tourism in Aruba depends

Table 2: Summary of international tourism demand using time series model (continued)

Author(S)	Topic	Variables	Model Using Time Series	Results
				on the changes of income, exchange rate and relative price.
Gonzalez and Moral (1995)	" Analysis of International Tourism Demand in Spain"	-Depend: international arrivals -Independent: income index, price index (tourism and substitute price)	-Structural time series model	-Both Spanish tourism markets are very sensitive to the changes in relative prices and income of the country of origin.
Habibi et al. (2008)	"United Kingdom and United State Tourism Demand in Malaysia"	-Independent: Tourist arrivals -Dependent: income, tourism price, income, tourism price, and transportation cost"	-Co-integration analysis	-There has long-run equilibrium exists among variables and tourists are strongly sensitive to the tourism price.

2.2.2.2 International Tourism Demand Using Panel Data

There is also a handful of studies which use panel data in their econometric analysis due to several advantages over time series data, i.e. 1) it provides researchers with massive data sets, 2) it increases the degree of freedom which avoid the spurious results, 3) it reduces the collinearity among explanatory variables, 4) it improves the efficiency of econometric estimation and 5) it specially permits researchers to examine a number of important economic questions that cannot be addressed using cross-section or time series data sets, as reported at Hsiao (2003), and Serra et al. (2014).

Serra et al. (2014) study in the topic "A comparative analysis of tourism destination demand in Portugal" use a dynamic panel model to estimate the international tourist overnight stays in Portugal from six main countries (the UK, Germany, the Netherlands, Ireland, France and Spain). Various controlled variables (income per capita, harmonized household consumption, unemployment rate and final household consumption) are utilized in this study. Results from the study show that some tourist places in Portugal have high elasticity to the income per capita.

Yap and Allen (2011) study in the topic "Investigating other leading indicators influencing Australian domestic tourism demand" investigate leading indicators influencing Australian domestic tourism demand by using three dependent variables (numbers of nights stayed by holiday-makers, business travelers and visitors who visit friends and relatives) and using the consumer sentiment index, household debt and working hours of consumers as independent variables in this study. The study uses a panel three-stage least squares (3SLS). They find that the consumer sentiment index has significant impact on visitors who visit friends and relatives but not on holiday and business tourists. Also, household debt is increased because of domestic travels. Munoz (2007) employs dynamic panel data models to pinpoint the determinant factors that influence German tourism demand of each of the 17 most attractive Spanish tourism destinations from 1991–2003. The study enhances that the tourist's previous consumption is a significant factor affecting current tourism demand. Also, the demand for tourism in Spain is considered as luxury goods for the Germans and highly depends on tourism prices and the cost of travel between Germany and the destinations.

Garin-Munoz and Montero-Martin (2007) study on the topic "Tourism in the Balearic Islands" uses panel data from 14 countries during the period of 1991–2003 as well as a dynamic model to study tourism in the Balearic Islands. Numerous explanatory variables are used to explain the number of tourist arrivals. They find that previous tourism consumption has a significant effect on consumers' willingness to visit the destination country. Moreover, the result suggests that demand is heavily dependent on the development of economic activity in the origin countries and on the cost of living of in the destination country. The authors suggest that tourism advertisement and high-quality services should be included in tourism policy. Ibrahim (2011) uses panel data to investigate international tourism demand for Egypt and finds that all the explanatory variables except population variables are significant. Real gross domestic product per capita, real exchange rate and cost of living in Egypt are significant and inelastic and tourism in Egypt is sensitive to relative prices. Apart from the studies mentioned above, there are many papers other studies that use panel data , such as Massidda and Etzo (2012), Kusni (2013), Garin-Munoz and Amaral (2000), Naudy and Saayman (2004), and Proenca and Elias (2005).

Thus, in order to estimate the international tourism demand for Cambodia, this paper will use a panel data model of tourism demand for 26 selected countries. The detail summary of international tourism demand using paper data model is presented in the table 2 as the following.

Table 3: Summary of international tourism demand using panel data model

Author (S)	Topic	Variables	Models Using Panel data model	Results
Monoz (2007)	"German Demand for Tourism in Spain"	-Dependent: international tourist arrivals -Independent:	-Dynamic Panel model	-Tourists' previous consumption is significant

Table 3: Summary of international tourism demand using panel data model (continued)

Author (S)	Topic	Variables	Models Using Panel data model	Results
		income, tourism price, lagged of dependent, and transportation cost.		factor current tourism demand. - The demand for tourism in Spain as luxury goods for Germans and depends on the movement of tourism price and travel cost.
Serra et al. (2014)	"Tourism in the Balearic Islands: A Dynamic Model for International Tourism Demand Using Panel Data"	-Dependent: Tourist Arrivals -Independent: previous tourism consumption, tourism price, economic activity	-Dynamic Panel Data Model	-Previous tourism consumption has significant effect to foreign travel and tourists are dependent on economic activity and tourism price.

2.2.2.3 Tourism demand forecasting model

While economists have tried to determine the determinant factors influencing international tourism demand there are a great number of papers developing methodologies and/or forecasting international tourism demand more accurately and effectively which benefit tourism planning and management. According to Song and Li (2008) simple regression, time-series approaches, standard regression techniques, state-of-the-art econometric methods to a time series of data, advanced regression models and multiple combined forecasting models have been employed for phenomena forecasting international tourism demand over more than three decades. These have been seen in the previous work of Swar et al. (1987), Beanman et al. (1979), Doering (1977), Cheung (1972), Chang et al. (2009), Artus (1976), Smeral and Weber (2010), Hoffman and Low (1981), S.Dharmaratne (1995), and Buchman and Ibrahim (1976).

In spite of the expansion of the evolution of methodologies for forecasting the international tourism flows it is surprising that a lot of academic researchers have still not developed a few simple forecasting models that can be used proficiently. Some forecasting approaches are characteristically complementary to each other (J.Calantone, Benedetto, & C.bojanic, 1988). Numerous papers have struggled to develop approaches and techniques to meet the accuracy and efficiency of forecasting as seen in the work of Witt and Du Preez (2003). They compare the two time series forecasting model to predict the future of international tourists flow in Seychelles from four European countries and find that ARIMA displays better performance than univariate and multivariate state space modeling.

Chu (2011) uses a piecewise linear approach to modeling and forecasting demand for Macau tourism by comparing the model with several models. Chu (2011) finds that a piecewise linear approach is more accurate than the three benchmark models (autoregressive trend model, seasonal autoregressive integrated moving average and its arch-rival fractionally integrated autoregressive moving average models).

Kulendran and King (1997), Kulendran and Witt (2001) and Turner and Witt (2001) compare the forecasting performances of both econometric and univariate time-series models as well as the no-change model, the multiple seasonal ARIMA, and

Exponential smoothing approach. Lim and McAleer (1999) and Goh and Law (2002) examine traditional Box-Jenkins multiplicative seasonal autoregressive integrated moving average model (ARIMA). Crouch (1994), Li et al. (2005), Lim (1997a, 1997b and 1999) and Witt and Witt (1995) can be also found in the international tourism demand forecasting research papers.

CHAPTER 3

METHODOLOGY

3.1 Research Methodologies

The panel data model is used in this study due to its two main advantages. Firstly, the use of annual data avoids the seasonality problem which is dominant in this sector. Secondly, the utilization of panel data set involves relatively large numbers of observations and a consequent increase in degree of freedom which reduces collinearity and improves efficiency of the estimate (Hsiao, 2003).

The two main models, fixed and random effect, originated from a panel data of 26 countries during the period of 1996–2012. According to the Hausman test (Hausman and Taylor, 1981; Wooldridge, 2002; and Judge et al., 1980) either the fixed-effect model or the random-effect model is chosen for its results. The fixed-effect model allows for heterogeneity by allowing each variable to have its own intercept value which may be different across variables and does not vary overtime (time invariant) (Baltagi et al., 2003). In contrast, random-affect model has a common mean value for the intercept and assumes exogeneity for all the regressors and the random individual effects (Baltagi, Bresson, & Priotte, 1987).

The equation of this study is presented as follows:

$$\ln Q_{i,t} = f\left(\ln GDPPC_{i,t-1}, \ln RP_{i,t}, \ln TC_{i,t}, D_1, D_2, D_3, D_4, D_5, D_6, D_7, D_8, D_9, D_{10}, D_{11}\right) \quad (1)$$

Where, $\ln Q_{i,t}$ = logarithm of number of tourist arrivals to Cambodia from country of origin "i" during year "t," where t is the period of1996–2012.

$\ln GDPPC_{i,t-1}$ = logarithm of GDP per capita of the origin country "i" at time "t–1" in constant term.

$\ln RP_{i,t}$ = logarithm of the relative price level, using CPI in Cambodia over CPI in the origin country "i" at time "t."

adjusted for differences in exchange rate between the currencies of the origin and destination countries.

$\ln TC_{i,t}$ = logarithms of total cost of trip from country of origin "i" to Cambodia, which is measured by multiplying the distance between the origin country to Cambodia by the average annual price of crude oil per barrel in USD.

D_1 = the global financial crisis during 2008–2009, for which D_1 = 1 in the period of 2008–2009, and D_1 = 0 = otherwise.

D_2 = the financial crisis in Asia in the period of 1998–1999, for which D_2 = 1 during 1998–1999, and D_2 = 0 = otherwise.

D_3 = the September 11 attack in the U.S. during 2001–2002, for which D_3 = 1 in the period of 2001–2002, and D_3 = 0 = otherwise.

D_4 = the Thai military coup in 2006, for which D_4 = 1 in 2006, and D_1 = 0 = otherwise.

D_5 = the Cambodia–Thai border dispute during 2008–2011, for which D_5 = 1 during 2008–2011, and D_5 = 0 = otherwise.

D_6 = the SARS epidemic in East Asia in 2003, for which D_6 = 1 in 2003, and D_6 = 0 = otherwise.

D_7 = the political instability and political deadlock in Cambodia in 1997–1998 and 2003, for which D_7 = 1 in 1997–1998 and 2003, and D_7 = 0 = otherwise.

D_8 = the tsunami in Japan during 2011–2012, for which D_8 = 1 in the period of 2011–2012, and D_8 = 0 = otherwise.

D_9 = the tsunami in Southeast Asia during 2004–2005, for which D_9 = 1 in the period of 2004–2005, and D_9 = 0 = otherwise.

D_{10} = the single visa entry scheme to enter five ASEAN countries (Cambodia, Laos, Myanmar, Thailand, and Vietnam), started in 2012, for which D_{10} = 1 in 2012, and D_{10} = 0 = otherwise.

D_{11} = the visa exemption among ASEAN countries in the period of 2006–2012, for which D_{11} = 1 during 2006–2012, and D_{11} = 0 = otherwise.

3.1.2 Hausman-Taylor Model

The Huasman and Taylor model (1981) can be written as flows:

$$Y_{it} = \beta X_{it} + \gamma Z_i + \alpha_i + U_{it} \quad (2)$$

Where,

i = 1, 2… N and t= 1, 2… T.

Z_i = the individual time-invariant variables

α_i = the independent and identically distributed $(0, {\sigma_\alpha}^2)$

U_{ti} = the independent and identically distributed $(0, {\sigma_u}^2)$

β = the coefficient of independent variable

X_{ti} = the independent variables

According to Huasman and Taylor model (1981), divide $X = [X_1, X_2]$, and $Z = [Z_1, Z_2]$ into two groups of variables, such that $X_1 = n \times K_1, X_2 = n \times K_2$, $Z_1 = n \times g_1, Z_2 = n \times g_{12}$, and $n = NT$. X_1, and Z_1 are assumed exogenous and not correlated with α_i, and U_{it}, while X_2, and Z_2 are endogenous due to their correlation with α_i but not with U_{it}. It is clear that in this model OLS is biased and inconsistent, while fixed effect estimator cancelling out the α_i using within transformation is consistent. The latter estimator also omits out the Z_i and as a consequence cannot provide estimates of γ. The random effect estimator which is GLS on (2) ignoring the endogeneity due to $\alpha_i$will also yield biased and consistent estimates of the regression coefficients.

Hausman and Taylor (1981) suggest an instrumental variable estimator which pre-multiples (1) by $\Omega^{-1/2}$ where Ω is variance covariance term of the error component $\alpha_i + U_{it}$, and then perform two-stage least squares using instruments $[Q, X_1, Z_1]$. Q is the within transformation matrix with $\tilde{y}$ = Qy having a typical element $\widetilde{y_{it}} = y_{it} - y_i$ and $\bar{y}_i$ is the individual mean. This turns out to be equivalent to running 1sls with $[\tilde{X}, \bar{X}, \bar{Z}_i]$ as the set of instruments. If the model is identified in the sense that there are at least as

many time-varying exogenous regressors X_1 as there are individual time-invariant endogenous regressors Z_2, i.e $k_1 \geq g_2$, then this Hausman test estimator is more effective than Fixed effect estimator. It the model is under-identified, where $k_1 \geq g_2$, then one cannot estimate γ and the Huasman estimator of β is identical to fix effect (Baltagi, Bresson, & Pirotte, 2003).

3.1.3 Fixed-Effect Model

The Fixed-effect model is used to analyze the impact of variables that vary over time. The model assumes that each country has an individual unobserved country-specific effect and estimates the constant term (unobserved country-specific effect) for each country by allowing for heterogeneous intercepts across cross-sectional individuals and/or over time using a differential intercept dummy. So each individual has its own specific coefficient (Yang et al., 2010; Woodridge, 2002; Baltagi et al., 2003). The simple formula for fixed-effect model set by Suriya and Sudtasan (2013) can be written as:

$$Y_{it} = (\alpha_0 + \phi_i S_i) + \beta_k X_{it} + \theta_i \sum_{i=1}^{n} D_i + \varepsilon_{it} \quad (3)$$

Where

Y_{it} = the dependent variables.

α_0 = the common value in the constant.

ϕ_i = the differential intercept coefficients which vary across-sectional individual.

S_i = the differential intercept dummies, which indicate cross-sectional individual.

θ_i = the coefficient of the dummy variables of the events

D_i = the dummy variables of individual variable.

β_k = The parameters of the independent variables.

X_{it} = The independent variables.

ε_{it} = The error term.

i = the specific individual.

t = the specific time.

Most of the past tourism demand studies use the double logarithmic form and represent in the form of elasticity demand. Hence the equation (3) can be rewritten as:

$$\ln Q_{i,t} = \alpha_0 + \beta_k \left[\ln GDPPC_{i,t-1} + \ln RP_{i,t} + \ln TC_{i,t}\right] + \theta_1 D_1 + \cdots + \theta_{11} D_{11} + \varepsilon_{i,t} \quad (4)$$

Where,

$Ln Q_{i,t}$ = the logarithm of number of tourist arrivals to Cambodia from country of origin "i" during year "t," where t is the period of 1996–2012.

α_0 = the common value in the constant term.

β_k = the parameters of the independent variables, where k = 1… 3.

θ_j = the parameter of dummy variables, where j = 1… 11.

i and t = the cross section data and time series data, respectively.

$\ln GDPPC_{i,t-1}$ = the logarithm of GDP per capita of the origin country "i" at time "t–1" in constant term.

$\ln RP_{i,t}$ = the logarithm of the relative price level, using CPI in Cambodia over CPI in the origin country "i" at time "t" adjusted for the differences in exchange rate between the currencies of the origin and destination countries.

$\ln TC_{i,t}$ = the logarithm of total cost of trip from country of origin "i" to Cambodia, which is measured by multiplying the distance between the origins country "i" to Cambodia by the average annual price of crude oil per barrel in USD.

$\varepsilon_{i,t}$ = the error term.

Suriya and Sutasan (2013) point out that all the parameters are the same but only different at the constant of each of specific variables. The calculation of the constant of each of the specific variables can be found following Judge et al. (1988) in the part of pooling time-series and cross-sectional data using dummy variables.

3.1.4 Random-Effect Model

Random-Effect model is possibly used to estimate both individual and time specific effects of certain variables even though they are either individual-specific but time-invariant variables or time-specific but individual-invariant variables; any of which can not be tested by the fixed-effect model (Keum, 2008). The random-effect model assumes that the unobserved country-specific effect follows a normal distribution in order to measure only one constant term (Yang et al., 2012; Judge et al., 1980; Baltagi, Bresson, and Priotte, 2002). The simple formula for random–effect model set by Suriya and Sudtasan (2013) can be written as:

$$Y_{it} = \alpha_0 + \beta_k X_{it} + \varepsilon_{it} \quad (5)$$

Where, $\varepsilon_{it} = \lambda_{it} + \gamma_{it}$, and X_{it} includes the dummy variables which have its own coefficient, presented by θ_j.

So, $$Y_{it} = \alpha_0 + \beta_k \theta_j X_{it} + \lambda_{it} + \gamma_{it}$$

And, $$Y_{it} = (\alpha_0 + \lambda_{it}) + \beta_k \theta_j X_{it} + \gamma_{it} \quad (6)$$

Where,

Y_{it} = the dependent variables.

α_0 = the common value in the constant.

β_k = the parameter of the independent variables, which k =1… 4.

θ_j = the parameter of the dummy variables, which j = 1… 11.

X_{it} = the independent variable.

ε_{it} = the error term.

λ_{it} = the unobserved time-specific random effects, independently and identically distributed with zero mean with variance.

γ_{it} = the common white noise error term.

As most of tourism demand studies uses the double logarithmic form and represent in the form of elasticity demand, hence the equation (6) can be written as:

$$\ln Q_{i,t} = (\alpha_0 + \lambda_{it}) + (\theta_1 D_1 + \cdots + \theta_{11} D_{11}) + \beta_k (\ln GDPPC_{i,t-1} + \ln RP_{i,t} + LnTC_{i,t} + \gamma_{i,t} \quad (7)$$

Where,

$LnQ_{i,t}$ = the logarithm of number of tourist arrivals to Cambodia from country of origin "i" during year "t," where t is the period of 1996–2012.

α_0 = the common value in the constant.

β_k = the parameter of independent variables, which k = 1… 3.

θ_j = the parameter of dummy variables, where j = 1… 11.

i and t = the cross section data and time series data, respectively.

$lnGDPPC_{i,t-1}$ = the logarithm of GDP per capita of the origin country "i" at time "t–1" in constant term.

$lnRP_{i,t}$ = the logarithm of the relative price level, by using CPI in Cambodia over CPI in the origin country "i" at time "t" adjusted for differences in exchange rates between the currencies of the origin and destination countries.

$lnTC_{i,t}$ = the logarithm of total cost of trip from country of origin "i" to Cambodia, which is measured by multiplying distance between the origin country "i" to Cambodia by the average annual price of crude oil per barrel in USD.

This model, individual and time specific effects point out how much respective effect derives from the common value.

3.1.5 Hypothesis

Most of the international tourism demand studies have appeared dependent on the demand theory so the expected signs of all the parameters in this study are due to the general views of the demand theory. In the case of tourism demand the choice of tourism demand is related to an income of the tourists from the origin country, tourism price in the destination country and other factors relevant to tourism's decision-making on spending their time in the destination country. This can be written in a simple tourist's demand function.

$$Q = f(\text{income}, \text{relative price}, \text{transportation cost}, \text{other factors})$$

Or,

$$Q = f(Y, RP, TC, \text{other factors})$$

Regarding the demand function; the hypothesis in the international tourism demand in Cambodia is as follows.

Hypothesis I: if income (Y) of tourist increases holding other constant then demand for tourism products in the destination will increase according to the Engle curve's suggested. Therefore, income in the origin country has a positive effect on the destination country.

Hypothesis II: If the relative price in the destination country increases, while tourism income of origin countries remains unchanged, then the amount of tourism consumption in the destination country will be decreased. Hence, relative price has a negative effect on the tourism demand.

Hypothesis III: If the transportation cost from the country of origin to the destination country increases, holding other variables constant, then the tourists will instead consider other destinations that offer a suitable price. Thus, transportation cost or travel price has a negative association with tourism demand.

Hypothesis IV: Unpredictable event such as natural disaster, political instability and crime normally received from news warnings or each of the embassies alerting messages in either the country of origin or the destination country fundamentally effect on the tourist decision-making. All of these events have negative significant effect on tourism demand.

Hypothesis V: Tourism policies, marketing campaigns and main tourism events are all critical attractions to draw tourists from their country of origin to the destination country. It can be concluded that tourism policy, marketing campaign, and/or special tourism events have positive relationships.

The overall summary of the expected sign of all the variables that use in this paper are illustrated in the table below:

Table 4: The expected sign of parameters of variables

Parameters	Variables	Sign
β_1	GDPPC	+
β_2	RP	-
β_3	TC	-
θ_1	D_1	-
θ_2	D_2	-
θ_3	D_3	-
θ_4	D_4	-
θ_5	D_5	-
θ_6	D_6	-
θ_7	D_7	-
θ_8	D_8	-
θ_9	D_9	-
θ_{10}	D_{10}	+
θ_{11}	D_{11}	+

3.2 Scenario Analysis

In addition to the study of determinant factors that impact on international tourism demand coming to Cambodia this paper tries to forecast international tourist arrivals to Cambodia from 26 countries of origin five main regions over the time period (2014–2017).

The scenario analysis concerns possible changes in either Cambodia or in the world, especially in each of the country of origin, by following the hypothesis guidelines consistent with economic factors and unprecedented non-economic factors. The analysis is based on panel data models (fixed effect and random effect) which have been selected by the Hausman Test for their results. The models enable the testing of sensitivity of tourism demand to a number of parameters as aforementioned.

The two critical scenarios categories are economic factor scenarios, and non-economic factor scenarios.

3.2.1 Economic factor scenarios

3.2.1.1 Inflation

Cambodia experienced high inflation growth in 2008 and 2009 forcing the price of products up at a very high rate. For the last several years the inflation rate of

Cambodia seems to have stabilized at around 4 to 5 percent. The independent economic analysts in Cambodia predict Cambodia should maintain a stable inflation rate of not more than 5 percent. Otherwise, Cambodia will face a number of problems related to the high price of products. For example, if the inflation goes up, the price of all things in Cambodia will rise, including the price of tourism. The rising price of tourism products will cause tourists to perhaps move their planned holiday to other countries instead of Cambodia.

3.2.1.2 Income

Global income experienced a largely negative growth in 2008 and in 2010 at 22 percent and 4.3 percent. It started a recovery in positive growth in 2013 at about 16.6 percent according to Signature global asset management (2014). Supposing the global income growth has a negative growth rate. This will slow down the movement of international travelers' holiday in other countries which also may slow the growth the number of tourist arrivals in Cambodia.

3.2.1.2 Transportation Cost

The unstable crude oil airline price is maybe a reason that round trip airfares vary up and down quite often. Crude oil price is a very important element that can increase the airfare cost becoming an obstacle for tourists' decision-making on a holiday based on their income. The price of crude oil experienced a high growth rate of about 37 percent and 38 percent in 2005 and 2008 respectively. Its average growth rate was 13 percent last year based on statistics from the U.S. Department of Energy. Supposing the average annual price of crude oil increases; transportation costs will increase reflecting to the international tourism demand in Cambodia.

3.2.2 Non-Economic factor Scenarios

3.2.2.1 Cambodia security context

Tourists always bear in mind security in the country they plan to visit. Cambodia has often been ranked as an unsafe country for tourists as Cambodia has quite a gruesome historical background from such thing as civil war, political instability and violent events. Currently, the country is moderately stable and becoming more noticed by the outside world. However, the stable situation seems unclear.

The current situation in late 2013 presented a persistent context of local

of local political tensions, violent, mass demonstration alerts and subsequent travel safety uncertainties. If these situations remain unchanged there will be little change in tourist movements.

In contrast, if the domestic security assumes prosperity, peace, safer travel and a more stable social environment then international tourism demand would increase with average incomes and tourism consumption becoming much more favorable. Yet, the appearance of insecurity thwarts tourist's decision-making on visiting in Cambodia. Thus the substitute tourist destination appears. The frequent travelers may shift their vacation to other countries that are more secure than Cambodia.

3.2.2.2 Regional security context

Recently, sustainable regional security in the Asia region is becoming a popular topic for debate among researchers and world leaders. The South China Sea dispute between China, Vietnam, the Philippines and Malaysia is the most concerning issue. These disputing countries are the main sources of the tourism market for Cambodia. The possibility of war among them limits some in their choices.

3.2.2.3 International security context

Similar to the above contexts tourism has always experienced numerous crises such as the global financial crisis, natural disaster, crime and terrorism. All of these uncontrollable events may seriously affect tourism demand. By assuming that one or more of a global financial crisis, natural disaster in Japan or another terrorist attack like September 11 in the U.S occur again there will be a significant drop in international travel. The global financial crisis created high unemployment, reduced individual's income, and limited tourists' future journey. Events like this forces travelers to reduce their tourism consumption.

All the above variables possibly need adjustment through the two main scenario categories. There are a number of crucial variables in this study identified and summarized in the table below:

Table 5: Summary of the scenario analysis

Scenarios	Variables
1) If the inflation in Cambodia or the origin country increases, the consumer index of all products including tourism products will be increased.	1) The relative price (RP) has to adjust at the levels that are able to attract the international tourism demand.
2) If the global income has either negative or positive growth rate (origin countries), then this will influence to the future tourist inflow into Cambodia.	2) GDP per Capita must be taken into account in order to determine policies to reflect tourism demand in Cambodia.
3) If the average annual oil price increases by 20 percent, it may reduce the tourist movement travelling oversea.	3) The travel cost (TC) variable should identify clearly.
4) If political instability, violence, SARS outbreak and mass demonstration events happen in Cambodia and warning messages on foreign travels spread out tourists will reconsider their holiday in Cambodia.	4) Dummy variable D_7 must get paid close attention.
5) If global insecurity appears in the feature as a new global financial crisis, natural disaster, territory dispute between Cambodia and neighboring countries then the global unemployment rate will increase; Cambodian income will decrease and insecurely increase. This will slow tourist travel overseas.	5) So, dummy variables D_1,D_2,D_3,D_8, D_9 and D_{10} should be investigated.

CHAPTER 4

THE EMPIRICAL RESULTS

4.1 Results and Discussion

4.1.1 Results of Determinant Factors Influencing International Tourism Demand in Cambodia

Results from either the fixed-effect or random-effect model, after being chosen according to the Hausman test, are reported in Table 6. In terms of checking whether the determinants of economic factors and non-economic factors seriously influence international tourist arrivals to Cambodia the fixed-effect model is more appropriate for the 26 countries grouped under ASEAN, Asia and Oceania. For Europe and North America it is more approximate to employ the random-effect model. The robustness checking method which is capable of identifying important factors and widespread impacted movement of variables is used in this study. It will be checked by excluding insignificant variables from the models as results presented in Table 7. According to the table 7, only North America is appropriate for the random-effect model and other regions are more appropriate for fixed-effect model. The signs of statistically significant variables in Table 6 and Table 7 are the same but have a slightly different coefficient value. Moreover most variables have the expected sign and level of significance. Results from the Table 7 are necessarily used for forecasting international tourism arrivals to Cambodia. Because this study deeply concerns outspreading of variables on tourist arrivals to Cambodia the outcomes from Table 7 are used as the main interpretation.

Results from the analysis in Table 7 indicate that the GDP per capita of the origin countries in the previous year have a significant and positive effect on international tourist arrivals to Cambodia; especially tourist arrivals from ASEAN, Oceania, and North America. Because the dependent variables (Q) and independent variables for economic variables (GDPPC, RP, and TC) are in the natural log form, the coefficient of the variables represents in elasticity form. The coefficient of GDPPC in the previous

year of tourist arrivals from 26 countries, ASEAN, Oceania, and North America rank from 2.039 to 7.155 as an absolute value across the models. This suggests that tourism to Cambodia is elastic to income changes in the countries of origin; specifically tourist arrivals from ASEAN, Oceania, and the North America group. This implies the tourists are highly sensitive to the income changes (GDPPC in the previous year). The result may reflect more the fact that, for many people from ASEAN, Oceania and North America, incomes are sufficient to produce international tourism, and any changes in income may have huge impact on international tourism demand.

Relative prices in Cambodia have a negative impact on international tourist arrivals to Cambodia from Oceania and a positive effect on tourist arrivals from Europe The sign for European tourists is an unexpected sign. Generally, most studies have expected relative prices in destination country are negative impact on the demand. However, Crouch (1995) argued with this view. He asserts that a positive sign of relative price occurred about 29 percent of cases. The relative price elasticity ranks at -0.835 to 0.049 for tourist arrivals from Oceania and Europe respectively. Tourists from Oceania countries appear more sensitive than tourists from Europe. Overall, tourists from these two regions are less sensitive to the price change in Cambodia because their relative price elasticity is less than one. This is strongly supported by the findings of Eilate and Einav (2004) and Naude and Saayman (2005). They indicate the cost of living in the less developed countries is less sensitive to price changes because the cost of living in less developed countries is relatively low.

An unexpected sign is transportation cost having a significant and positive effect on tourist arrivals to Cambodia from Asia, Oceania, and Europe. Only tourist arrivals from North America have expected sign and a negative effect. The finding shows the behavior of these tourist groups might quite different. The distance between Asia and Cambodia is logically not an obstacle for discouraging tourists from travelling to Cambodia. There are direct airline connections between most Asian countries and Cambodia. Flight times are relatively short and therefore the cost is lower in comparison to their economic condition and motive. The distances between Oceania, Europe and Cambodia are extremely long haul. Tourists from these regions might take a trip to Cambodia via neighboring countries such as Thailand, Laos and Vietnam which are less than two hours

flying to/from Cambodia. It is also quite easy to travel overland to Cambodia. According to annual reports from the Ministry of Tourism in Cambodia there are increasing numbers of tourists travelling from Europe and Oceania year-on-year through Thai-Cambodian and Vietnam-Cambodian border check-point. In contrast, flying between North America countries and Cambodia is long haul and expensive. There are also no airlines currently flying direct between Cambodia and North America. This lack of direct flights could be described as a barrier resulting in North America tourists altering their plans and travelling to other countries instead. Generally, transportation cost elasticity ranks from -0.475 to 0.719 are statistically significant. Therefore these tourist groups are less sensitive to transportation cost. This finding is consistent with Chokethaworn et.al (2010) who indicated transportation cost has a significant and positive effect on tourist arrivals to Thailand from Japan, Korea, China, Singapore, the United Kingdom, USA and Malaysia. However, there is no obvious reason for this pattern. According to Crouch (1995) many studies have difficulties in attempting to investigate the effect of transportation cost on demand.

The global financial crisis in the period of 2008–2009 (D1) has a significant and negative effect on tourist arrivals from North America. This result is likely due to hardship caused by the crisis having a more telling effect on the people in this region which in turn discourages them from traveling to Cambodia.

The financial crisis in Asia in the period of 1998–1999 (D2) had a negative impact on tourist arrivals to Cambodia from the 26 countries; especially tourists from North America. Paradoxically, European tourist numbers increased. It will be argued North American tourists were affected by the Asian financial crisis which discouraged them from visiting Cambodia resulting in arrival numbers decreasing yearly. The coefficients for ASEAN and Asia are not significant for this variable, and being negative, are in line with the expected results. Results suggest that the crisis impacted upon some countries of ASEAN and Asia. This is consistent with the findings of many researchers including Lee and McKibbin (2007) and Bustelo (2002) who assert the crisis severely affected Indonesia, Malaysia, Thailand, the Philippines, and the Republic of South Korea. They also claim the Asian financial crisis impacted less on some ASEAN (i.e., Singapore,

Vietnam, Laos, and Cambodia) and Asian (Japan and Taiwan) countries. China and India, two major sources of tourism for Cambodia, showed no impact at all.

North America is another major source of international tourists to Cambodia. Nanto (1998) indicated that in CRS report for Congress American and Asian financial markets are strongly interlinked. Therefore it may be suggested the negative effect on tourists from North America during this period might be due to the USA's interlinked economy with Asia. What happens in Asian financial markets can have affected on U.S markets. He added that the Asian financial crisis influenced the U.S economy both macro and micro economically. On the macroeconomic level it affected the U.S growth rate, interest rate, balance of trade, and related variables. On the micro level it affected specific industries in various ways depending on their relationship to Asian economics. These findings are also reflected in the works of Harrigan (2000) and Obstfeld and Rogoff (2009). In contrast, Europe benefitted from the Asian financial crisis. Due to the Asian financial crisis pressure was applied to lower the price of oil price and also to lower interest rate in European countries. This, in turn, contributed to a strengthening of GDP growth rate in the European region despite the financial crisis in Asia at the time (WTO press release, 1998). To add weight to above, there is consistency shown from the reports of the Ministry of Tourism in Cambodia. Tourist arrivals to Cambodia from Europe increased from 43,331 (1997) to 46,165 (1998) then rising to 60,031 (1999). Tourist arrivals from North America decreased over the same period, i.e., from 27,812 (1996) to 24,561(1997); falling further in 1998 to 21,773.

The September 11 attack in the U.S. during 2001–2002 (D3) had a significant and negative effect on tourist arrivals from North America. Concurrently there was a significant and positive effect on tourist arrivals from Oceania and Europe. This result supports the fact American sentiment was low right after the September 11 attack which, while discouraging Americans from travelling abroad, had no impact on tourist arrivals from Oceania and Europe. In addition the Thai military coup in 2006 (D4) had no significant effect on tourist arrivals to Cambodia.

The Cambodia-Thai border dispute in the period of 2008–2011 (D5) had a positive effect on international tourist arrivals to Cambodia from Oceania and North America. The Cambodian-Thai border dispute occurred near Preah Vihar temple which was listed

as a UNESCO world heritage site in 2008. The dispute deteriorated and led to an exchange of weapons fire several times; albeit only for a short period of time before the situation returned to normal. Findings suggest the Cambodia-Thai border dispute became an unexpected advertising channel for the Cambodia tourism industry which encouraged tourists to visit Cambodia. From the author's observation there was rarely news released about Preah Vihar temple either in local or international newspapers before the event occurred. Furthermore most Cambodian people had never heard about Preah Vihar temple. Since the dispute the story of Preah Vihar temple has been reported worldwide through all popular forms of media including BBC news, Al Jazeera, The New York Times, Bloombergs, Bangkok post, Chinese new papers, CNN, RFA, RFI, as well as domestic TV and newspapers. It could be said that due to the widespread publicly of this border dispute people around the world began searching out information about Cambodia resulting in them planning trips to Cambodia. This growth is coherent with the Cambodian Ministry of Tourism's 2012 Annual Report starting that international tourist arrivals have grown from 2.1 million in 2008 to 3.6 million in 2012.

The SARS epidemic in Asia in 2003 (D6) had a significant and positive effect on tourist arrivals from every region. The SARS epidemic was not severe in Cambodia. This result may suggest that the image of Cambodia as a place relatively safe from SARS could encourage tourists to visit Cambodia instead of visiting other countries.

The political instability and deadlock in Cambodia in 1997–1998 and 2003 (D7) had a negative impact on tourist arrivals from the 26 countries, especially tourist arrivals from Oceania, Europe and North America. This suggests that internal conflicts in Cambodia could be very harmful to the tourism industry as they discourage tourists, especially those from long-distance countries, from visiting Cambodia.

The tsunami in Japan in the period of 2011–2012 (D8) and the tsunami in Southeast Asia in the period of 2004–2005 (D9) had a significant and positive effect on international tourist arrivals to Cambodia from every region. This suggests that although the events are horrific and dismal to the affected countries they benefitted Cambodia's tourism industry. Tourists may have changed their plans from travelling to the impacted countries and travelled to Cambodia instead.

The single visa entry scheme to enter five ASEAN countries (Cambodia, Laos, Myanmar, Thailand, and Vietnam) which commenced in 2012 (D10) had a significant and positive effect on tourist arrivals from Oceania. This suggests that international tourists, especially from Oceania, utilize the benefit of a single visa because they can plan to visit several countries in ASEAN using the same visa. The visa exemption among the ASEAN countries in the period of 2006–2012 (D11) had no significant effect on tourist arrivals to Cambodia.

Table 6: Results of panel data analysis, using number of international tourist arrivals as dependent variable

Variables	Total 26 countries	ASEAN	Asia (EA+SA)	Oceania	Europe	North America
	Fixed	Fixed	Fixed	Fixed	Random	Random
Constant	-5.428*** (0.040)	-14.759*** (0.022)	7.036*** (0.001)	-30.108*** (0.000)	1.864 (0.711)	-59.06*** (0.000)
lnGDPPC (t-1)	1.442*** (0.000)	2.965*** (0.000)	-0.146 (0.323)	2.674*** (0.001)	-0.020 (0.971)	7.186*** (0.000)
LnRP	-0.006 (0.853)	-0.195 (0.728)	-0.046 (0.667)	-0.988*** (0.003)	0.042*** (0.026)	0.015 (0.950)
LnTC	0.050 (0.781)	-0.085 (0.850)	0.364** (0.053)	0.302*** (0.035)	0.564*** (0.000)	-0.504*** (0.002)
D1	-0.100 (0.321)	-0.117 (0.644)	-0.074 (0.790)	0.101 (0.257)	-0.028 (0.768)	-0.392*** (0.006)
D2	-0.162* (0.093)	-0.306 (0.216)	-0.227 (0.314)	0.041 (0.606)	0.180*** (0.040)	-0.357*** (0.008)
D3	0.007 (0.935)	-0.171 (0.419)	-0.052 (0.806)	0.181* (0.064)	0.210*** (0.013)	-0.342*** (0.008)
D4	-0.127 (0.283)	-0.026 (0.930)	0.073 (0.796)	-0.047 (0.584)	-0.059 (0.542)	-0.086 (0.574)
D5	0.089 (0.449)	0.038 (0.896)	0.415 (0.158)	0.162* (0.100)	0.118 (0.265)	0.323* (0.062)
D6	1.027*** (0.000)	0.823*** (0.014)	0.989*** (0.001)	0.663*** (0.000)	1.272*** (0.000)	0.449*** (0.005)
D7	-0.217** (0.016)	-0.286 (0.209)	-0.203 (0.357)	-0.178*** (0.019)	-0.215*** (0.005)	-0.261** (0.027)
D8	1.412*** (0.000)	1.736*** (0.000)	1.317*** (0.000)	0.901*** (0.000)	1.291*** (0.000)	0.954*** (0.000)
D9	1.117*** (0.000)	0.704*** (0.045)	1.130*** (0.000)	0.586*** (0.000)	1.205*** (0.000)	0.647*** (0.000)
D10	0.245 (0.141)	0.330 (0.426)	0.555*** (0.001)	0.283** (0.044)	0.188 (0.203)	0.344 (0.147)
D11	0.284 (0.178)	-0.156 (0.769)				
R-squared	0.0255	0.0002	0.7098	0.7996	0.3293	0.9860
No.of countries	26	8	5	2	9	2
No. of obs.	442	136	85	34	153	34

Note: The numbers in parentheses are the p-values "*", "**", and "***" denote the statistical significance levels at 10%, 5%, and 1% respectively.

Table 7: Results of panel data analysis after using robustness checking method, using number of international tourist arrivals as dependent variable

Variables	Total 26 countries	ASEAN	Asia (EA+SA)	Oceania	Europe	North America
	Fixed	Fixed	Fixed	Fixed	Fixed	Random
Constant	-10.262*** (0.000)	-14.802*** (0.022)	1.792* (0.105)	-30.892*** (0.000)	1.068* (0.092)	-59.22*** (0.000)
lnGDPPC (t-1)	2.039*** (0.000)	2.796*** (0.000)		2.913*** (0.000)		7.155*** (0.000)
LnRP				-0.835*** (0.003)	0.049*** (0.006)	
LnTC			0.719*** (0.000)	0.265*** (0.013)	0.617*** (0.000)	-0.475*** (0.000)
D1						-0.282*** (0.029)
D2	-0.243*** (0.001)				0.203*** (0.006)	-0.343*** (0.007)
D3				0.139* (0.068)	0.217*** (0.002)	-0.334*** (0.004)
D4						
D5				0.230*** (0.005)		0.194* (0.083)
D6	0.956*** (0.000)	0.750*** (0.001)	0.837*** (0.000)	0.652*** (0.000)	1.263*** (0.000)	0.441*** (0.005)
D7	-0.287*** (0.000)			-0.172*** (0.017)	-0.207*** (0.005)	-0.250** (0.034)
D8	1.655*** (0.000)	1.938*** (0.000)	1.400*** (0.000)	0.863*** (0.000)	1.381*** (0.000)	1.166*** (0.000)
D9	0.973*** (0.000)	0.894*** (0.000)	1.013*** (0.000)	0.611*** (0.000)	1.180*** (0.000)	0.638*** (0.000)
D10				0.347*** (0.007)		
D11						
R-squared	0.0132	0.0004	0.4863	0.8210	0.3208	0.9836
No.of countries	26	8	5	2	9	2
No. of obs.	442	136	85	34	153	34

Note: The numbers in parentheses are the p-values "*", "**", and "***" denote the statistical significance levels at 10%, 5%, and 1% respectively.

Source: Calculation by the author, using STATA 12.

4.1.2 Results of Forecasting Tourism Demand by Using Scenario Analysis

The estimated tourism demand models presented in the previous section are used to forecast tourism arrivals to Cambodia during the period of 2014–2017. In order to forecast international tourist arrivals from each region (ASEAN, Asia, Oceania, EU, and North America) the study has only concentrated on the movement of independent variables (only economic factors) while assuming all the non-economic factors are zero. Those variables are the GDP per capita at the previous year ($GDPPC_{t-1}$), relative price (RP) and transportation cost (TC).

So, we can write a general tourism demand forecasting equation as follows:

$$\ln Q_{i,t} = \alpha_0 + \beta_1 \ln GDPPC_{i,t-1} + \beta_2 \ln RP_{i,t} + \beta_3 \ln TC_{i,t} + \varepsilon_{i,t} \quad (8)$$

By taking total differentiation on equation (8), the equation can be written as:

$$d\ln Q_{i,t} = \beta_1 \frac{\partial \ln Q_{i,t}}{\partial GDPPC_{i,t-1}} . dGDPPC_{i,t-1} + \beta_2 \frac{\partial \ln Q_{i,t}}{\partial RP_{i,t}} dRP_{i,t} + \beta_3 \frac{\partial \ln Q_{i,t}}{\partial TC_{i,t}} dTC_{i,t}$$

$$= \beta_1 \frac{\partial [\alpha_0 + \beta_1 \ln_{GDPPC_{i,t-1}} + \beta_2 \ln RP_{i,t} + \beta_3 \ln TC_{i,t} + \varepsilon_{i,t}]}{\partial GDPPC_{i,t-1}} dGDPPC_{i,t-1}$$

$$+ \beta_2 \frac{\partial [\alpha_0 + \beta_1 \ln_{GDPPC_{i,t-1}} + \beta_2 \ln RP_{i,t} + \beta_3 \ln TC_{i,t} + \varepsilon_{i,t}]}{\partial RP_{i,t}} dRP_{i,t}$$

$$+ \beta_3 \frac{\partial [\alpha_0 + \beta_1 \ln_{GDPPC_{i,t-1}} + \beta_2 \ln RP_{i,t} + \beta_3 \ln TC_{i,t} + \varepsilon_{i,t}]}{\partial TC_{i,t}} dTC_{i,t}$$

$$= \beta_1 \frac{1}{GDPPC_{i,t-1}} dGDPPC_{i,t-1} + \beta_2 \frac{1}{RP_{i,t}} dRP_{i,t} + \beta_3 \frac{1}{TC_{i,t}} dTC_{i,t}$$

$$\frac{d\ln_{Q_{i,t}}}{dQ_{i,t}} dQ_{i,t} = \beta_1 \frac{1}{GDPPC_{i,t-1}} dGDPPC_{i,t-1} + \beta_2 \frac{1}{RP_{i,t}} dRP_{i,t} + \beta_3 \frac{1}{TC_{i,t}} dTC_{i,t}$$

$$\frac{1}{Q_{i,t}} dQ_{i,t} = \beta_1 \frac{1}{GDPPC_{i,t-1}} dGDPPC_{i,t-1} + \beta_2 \frac{1}{RP_{i,t}} dRP_{i,t} + \beta_3 \frac{1}{TC_{i,t}} dTC_{i,t} \quad (9)$$

Where, $\frac{d\ln_{Q_{i,t}}}{dQ_{i,t}} = \frac{1}{Q_{i,t}}$, $\frac{dQ_{i,t}}{Q_{i,t}} = Q_{i,t} =$ growth rate of $Q_{i,t}$

$\frac{dGDPPC_{i,t-1}}{GDPPC_{i,t-1}} = GGDPPC_{i,t-1} =$ growth rate of $GDPPC_{i,t-1}$

$\frac{dRP_{i,t}}{RP_{i,t}} = GRP_{i,t} =$ growth rate of $RP_{i,t}$, and

$\frac{dTC_{i,t}}{TC_{i,t}} = GTC_{i,t} =$ growth rate of $TC_{i,t}$

Then the equation (9) can be transformed into the growth rate of international tourism demand forecasting equation:

$$GQ_{i,t} = \beta_1 GGDPPC_{i,t-1} + \beta_2 RP_{i,t} + \beta_3 TC_{i,t} \quad (10)$$

With having the coefficients for tourist arrivals from every region from TABLE 7, we can model the growth rate of international tourist arrivals from ASEAN, Asia, Oceania, Europe, and North America. Only the statistical significant variables are included in the equations as presented below:

$$GQ_{Asean} = 2.796\ GGDPPC(t-1)_{Asean} \quad (11)$$

$$GQ_{Asia} = 0.719\ GTC_{Asia} \quad (12)$$

$$GQ_{Oceania} = 2.913\ GGDPPC(t-1)_{Oceania} - 0.835 GRP_{Oceania} + 0.265 GTC_{Oceania} \quad (13)$$

$$GQ_{Europe} = 0.049\ GRP_{Europe} + 0.617\ GTC_{Europe} \quad (14)$$

$$GQ_{NA} = 7.155\ GGDPPC(t-1)_{NA} - 0.475\ GTC_{NA} \quad (15)$$

The three scenario assumptions for each of the region; the worst-case scenario (minimum value), the normal-case scenario (average value), and the best-case scenario (maximum value) are measured by selecting the minimum value among the countries in the region considering the worst-case scenario and the maximum value among the countries in the region considering the best-case scenario. The normal-case scenario is measured by an average of the average value of all countries for each region. The scenario assumptions are determined on the growth rate of GDPPC in the previous year ($GGDPPC_{t-1}$), the growth rate of RP (GRP), and the growth rate of TC (GTC). These scenario assumptions for each of the region are demonstrated below:

Table 8: Scenario assumption for ASEAN region

Growth Rate	Worst	Normal	Best
$GDPPC_{t-1}$	-0.1439	0.0238	0.1277
GRP	-0.3504	0.0614	0.8870
GTC	-0.3775	0.1266	0.5679

Table 9: Scenario assumption for Asia region

Growth Rate	Worst	Normal	Best
$GDPPC_{t-1}$	-0.1207	0.0441	0.1527
GRP	-0.1394	0.0071	0.4169
GTC	-0.3775	0.1266	0.5679

Table 10: Scenario assumption for Oceania region

Growth Rate	Worst	Normal	Best
$GDPPC_{t-1}$	-0.0278	0.0167	0.0457
GRP	-0.2151	-0.0064	0.2578
GTC	-0.3775	0.1266	0.5679

Table 11: Scenario assumption for Europe region

Growth Rate	Worst	Normal	Best
$GDPPC_{t-1}$	-0.0617	0.0124	0.0482
GRP	-0.9995	-0.0176	0.6593
GTC	-0.3775	0.1266	0.5679

Table 12: Scenario assumption for North America region

Growth Rate	Worst	Normal	Best
$GDPPC_{t-1}$	-0.0395	0.0155	0.0466
AGR	-0.1342	0.0001	0.2433
GTC	-0.3775	0.1266	0.5679

From Table 8 to Table 12 we can measure the growth rate of international tourism arrivals to Cambodia from five regions by plugging the values into the above international tourism demand forecasting equation (11)–(15). Hence the annual growth rate of international tourist arrivals from ASEAN, Asia, Oceania, Europe and North American can be found as shown in Table 13 (below). The results reveal that the growth rate of international tourist arrivals to Cambodia from every region, for the worst-case scenario, has a negative growth rate and has a positive growth rate for the normal-case and best-case scenario.

For the worst-case scenario, the tourists from the North America region have the highest dropped rate (55%) and the lowest negative growth rate from Oceania region (0.14%). For the normal scenario, tourist arrivals from ASEAN and Europe has the positive growth rate at about 8 percent while Asia and Oceania have a similar positive growth rate at approximately 9 percent. Tourists from North America have the lowest growth rate among other regions at about 5 percent. For the best-case scenario the growth rate of international tourist arrivals to Cambodia demonstrates the highest significant and positive growth rate compared with other two scenarios for every region. The highest tourist inflows to Cambodia are from Asia (41%) and the lowest rate from ASEAN (6%). Meanwhile, tourist arrivals to Cambodia are from ASEAN (36%), Oceania (7%), and Europe (38%).

Table 13: The percentages growth rate of international tourist arrivals to Cambodia, using scenario analysis

Growth Rate	Worst	Normal	Best
ASEAN	-40%	8%	36%
ASIA	-27%	9%	41%
OCEANIA	-0.14%	9%	7%
EUROPE	-28%	8%	38%
NORTH AMERICA	-55%	5%	6%

To forecast international tourist arrivals to Cambodia from ASEAN, Asia, Oceania, Europe, and North America (NA) over the period of 2014–2017 the growth rate of international tourist arrivals to Cambodia from every region through three scenario analysis (the worst-case scenario, the normal-case scenario, and the best-case scenario) have been used. Consequently numbers of international tourist arrivals to Cambodia from ASEAN, Asia, Oceania, Europe and North America during the period of 2014–2017 are illustrated in the following figures.

According to the Figure 1, international tourist arrivals to Cambodia from ASEAN, for the best-case scenario will positively increase by around 36 percent every year over 4 years 2014–2017. Tourist numbers will increase from 2.8 million in 2014 to 6.9 million in 2017. Also, for the normal-case scenario, tourist numbers will climb by 8 percent, from 1.5 million in 2012 to 1.6 million in 2013 with high positive growth in 2017 to 2.2 million tourists. On the other hand, for the worst-case scenario, tourist numbers will fall by approximately 40 percent from 1.5 million in 2012 to 0.9 million in 2013 and fall further down to 0.1 million tourist in 2017.

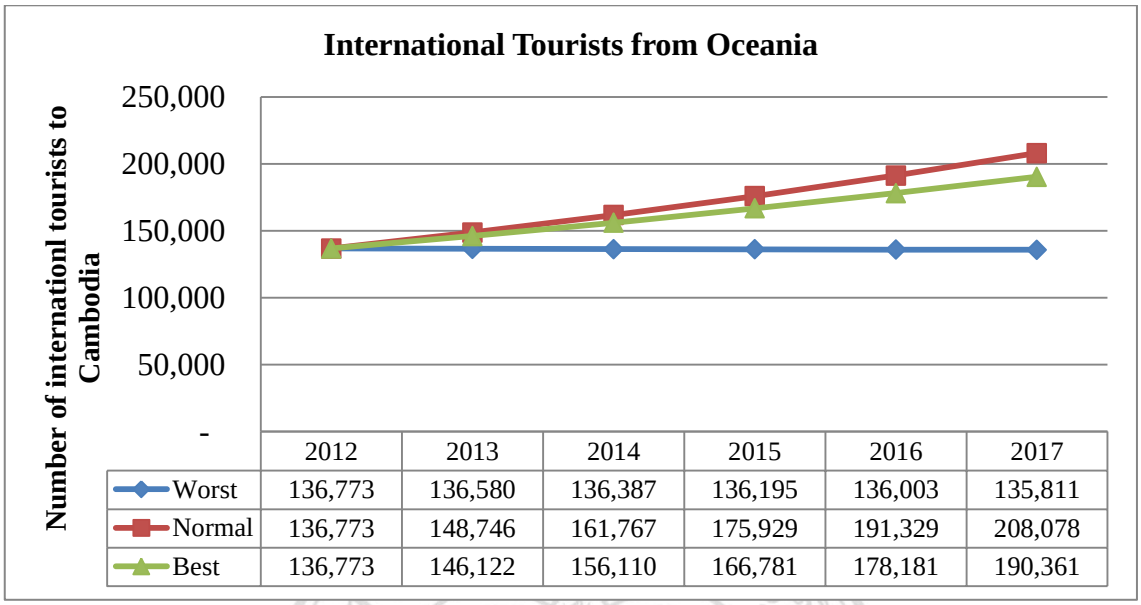
Figure 1: Forecasting results of international tourist arrivals to Cambodia from ASEAN during 2014-2017

For international tourist arrivals to Cambodia from Asia (Figure 2) the best-case scenario will be positive growth of 21 percent during 2014–2017 from 1.04 million tourists in 2012 to 1.5 million tourists in 2013 rising sharply to 5.7 million tourists in 2017. The worst-case scenario shows negative growth of 27 percent from 1.04 million tourists in 2012 to 0.21 million tourists in 2017. The normal-case scenario shows positive growth rate at approximately 9 percent over the forecasting period growing from 1.04 million tourists in 2012 to 1.13 million tourists in 2013 and upping to 1.6 million tourists in 2017.

	2012	2013	2014	2015	2016	2017
Worst	1,036,522	755,187	550,212	400,872	292,066	212,793
Normal	1,036,522	1,130,872	1,233,810	1,346,118	1,468,649	1,602,333
Best	1,036,522	1,459,755	2,055,802	2,895,227	4,077,407	5,742,294

Figure 2: Forecasting results of international tourist arrivals to Cambodia from Asia during 2014-2017

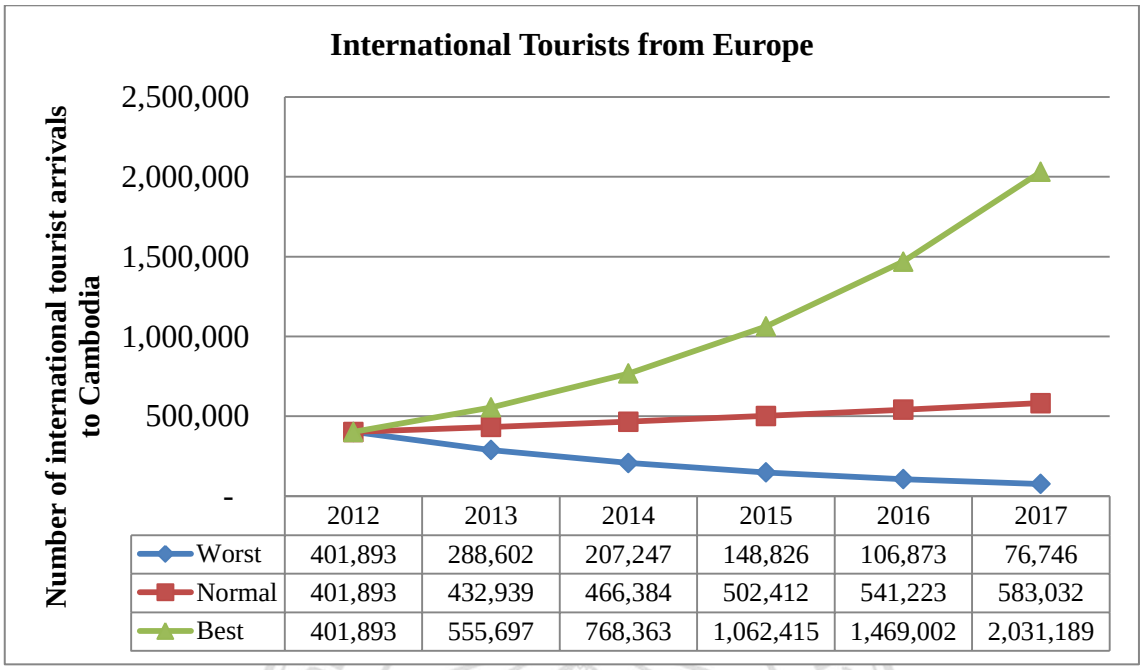
In the best-case scenario tourists from Oceania (Figure3) will augment positively at an annual growth rate of 7 percent. It shows an increase from 0.14 million tourists in 2012 to 1.9 million tourists in 2017. The normal-case scenario shows numbers increasing from 0.14 million tourists to 0.21 million for 2012–2017. For the worst-case scenarios international tourists to Cambodia will slightly decrease at annual rate about 0.14 percent from 2012 to 2017 from 0.14 million in 2014 to 0.13 million in 2017.



	2012	2013	2014	2015	2016	2017
Worst	136,773	136,580	136,387	136,195	136,003	135,811
Normal	136,773	148,746	161,767	175,929	191,329	208,078
Best	136,773	146,122	156,110	166,781	178,181	190,361

Figure 3: Forecasting results of international tourist arrivals to Cambodia from Oceania during 2014-2017

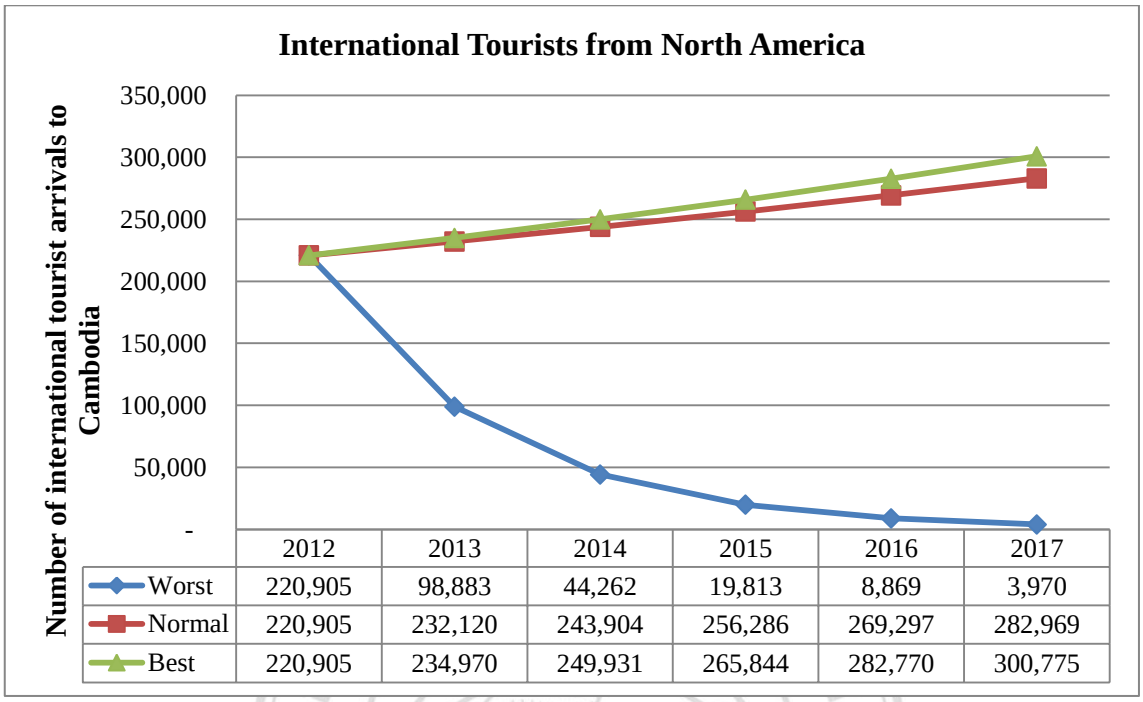
From Figure 4 the tourists from Europe, for the best-case scenario, will increase at an annual growth rate of 38 percent during 2014–2017. In 2014, the international tourists from Europe will climb up to 0.8 million tourist from 0.6 million tourists in 2013 and continue growing to 2.03 million in 2017. Whereas, in the normal-case scenario, 0.5 million tourists from Europe will visit in 2014 moving up to 0.6 million in 2017. On the contrary, in the worst-case scenario situation, tourist numbers will decline at annual rate of approximately 28 percent. It will decline from 0.3 million in 2012 to 0.21 million in 2014 and continue dropping to 0.08 million tourists in 2017.



	2012	2013	2014	2015	2016	2017
Worst	401,893	288,602	207,247	148,826	106,873	76,746
Normal	401,893	432,939	466,384	502,412	541,223	583,032
Best	401,893	555,697	768,363	1,062,415	1,469,002	2,031,189

Figure 4: Forecasting results of international tourist arrivals to Cambodia from Europe during 2014-2017

From the Figure 5 the number of international tourist arrivals to Cambodia from North America for the best and normal-case scenarios have similar positive annual growth rate of 6 and 5 percent respectively. As an absolute value, for the best scenario, the number of tourists will grow from 0.22 million in 2012 to 0.25 million in 2014 and extend to 0.3 million in 2017. Similarly, for the normal-case scenario, the number of tourists visiting Cambodia in 2014 will be around 0.24 million in 2014 rising to 0.28 million in 2017. However, for the worst-case scenario, the tourist numbers has severely negative growth rate at about 55 percent annually. In 2014, it will go down to 0.04 million from 0.22 million in 2012, and growth will slow to 3,970 tourists in 2017.



	2012	2013	2014	2015	2016	2017
Worst	220,905	98,883	44,262	19,813	8,869	3,970
Normal	220,905	232,120	243,904	256,286	269,297	282,969
Best	220,905	234,970	249,931	265,844	282,770	300,775

Figure 5: Forecasting results of international tourist arrivals to Cambodia from North America during 2014-2017

CHAPTER 5

CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Conclusions

The uncertainty and unsustainable growth of international tourist arrivals to Cambodia is influenced by economic and non-economic factors. This study measures determinant factors influencing international tourism demand from five regions (ASEAN, Asia, Oceania, Europe and North America) in Cambodia over the period of 17 years (1996–2012) by employing panel data and analyzing with fixed-effect and random-effect models. Results after checking the robustness are used as the main outcomes for interpretation. Forecasting international tourist arrivals to Cambodia using scenario analysis during the period of 2014–2017 is also included.

The highest estimated coefficient value of GDP per capita of the origin countries in the previous year of tourist arrivals is from North America group (7.155%) followed by Oceania (2.913%) and ASEAN (2.796%). This suggests that tourist arrivals from ASEAN and Oceania are less sensitive to income changes than tourist arrivals from North America. The tourists are dependent on the economic situation in each of their countries. The coefficient of these tourist groups is greater than one which implies that tourism demand in Cambodia is considered as a luxury for the tourists; especially tourist arrivals from North America.

The relative price elasticity is less than one and a negative value for tourist arrivals from Oceania. The fact that tourists from Oceania are less sensitive to an increasing cost of living in Cambodia is opposite to tourist arrivals from Europe wherein price elasticity is positive. Generally speaking, both tourist groups are less sensitive to price changes in Cambodia in a vice-versa way, implying that if relative price increases in Cambodia then tourist arrivals from Europe will slightly increase while tourist arrivals from Oceania will slightly decrease. However, tourism suppliers must be careful with prices in order to maintain their price competitiveness.

Transportation cost has a positive effect on tourist arrivals from Asia, Oceania and

Europe, which is an unexpected sign. Their transportation cost elasticity is less than one in absolute value; hence tourists from these three regions are less sensitive to transportation cost compared with other factors driving them to visit Cambodia. Certainly, tourists from Asia, Oceania, and Europe increase when transportation cost increases but it is at a low level; similar to the slow growth for tourists from the North America groups. Only North America reveals an expected sign.

It was also discovered that non-economic factors known as external shocks may have an impact on international tourist arrivals to Cambodia. Basically, the global financial crisis in the period of 2008–2009 (D1) had a negative impact on tourist arrivals from North America. The September 11 attack in the U.S. during 2001–2002 (D3) had a significant and negative effect on tourist arrivals from North America but a positive effect on tourist arrivals from Oceania and Europe. It is reasonable to assume that during and after the time line of these events tourists might respond to the situation by shifting their long distance trip to short distance trip; particularly tourists from North America. On the other hand, some tourists who were not hard hit by the events might continue their trip, plan as usual or even increase their trips; especially tourist from Oceania and Europe.

The negative impact generated by the financial crisis in Asia in the period of 1998–1999 (D2) might have reduced the tourist flow to Cambodia; especially from North America. Yet the event had a positive effect on tourist arrivals from Europe. The results confirm the unexpected negative sign on the tourist groups from North America.

The Thai military coup in 2006 had not impact on tourist arrivals to Cambodia. Cambodia–Thai border dispute in the period of 2008–2011 (D5) had significantly positive impact on tourist arrivals from Oceania and North America. This is an unexpected result.

The SARS epidemic in Asia in 2003 (D6) had a positive effect on tourist arrivals from the 26 countries group from every region. This result differs from the finding of Song et.al (2010) who indicated the SARS epidemic in Asia in 2003 had a strong and negative impact on tourist arrivals in China.

The political instability and political deadlock in Cambodia in 1997–1998 and 2003 (D7) had significantly negative impact on tourist arrivals from the 26 countries; essentially tourist arrivals from Oceania, Europe, and North America. Tourist arrivals from North

America and Europe seem more responsive to the context of security in the destination country than tourists from Oceania

The tsunami in Japan during 2011–2012 (D8) and the tsunami in Southeast Asia during 2004–2005 (D9) had a significant and positive effect on international tourist arrivals to Cambodia from every region. The single visa entry scheme to enter five ASEAN countries (Cambodia, Laos, Myanmar, Thailand, and Vietnam) which was started in 2012 (D10) had significant and positive effects on tourist arrivals from Oceania only. The visa exemption among the ASEAN countries in 2006–2012 (D11) had no significant effect on tourist arrivals from ASEAN.

This study is also forecasts the international tourist arrivals to Cambodia during the period of 2014–2017 by using scenario analysis. The three main scenario assumptions: the worst scenario, the normal scenario and the best scenario are determined only by three independent variables: $GDPPC_{t-1}$, RP and TC.

For forecasting results the worst scenario shows international tourist arrivals to Cambodia from North America will decline sharply by approximately about 55 percent. This is followed by 40 percent for tourists from ASEAN during 2014 to 2017. Tourist arrivals numbers from Oceania shows the slowest negative growth rate of 0.12 percent. Worst scenario tourist numbers from Asia and Europe show a downturn of 27 percent and 28 percent respectively.

For the normal scenario tourist arrivals from ASEAN, Europe, Asia and Oceania show almost the same positive growth rate at 8 percent and 9 percent respectively. Tourist numbers from North America has the lowest growth rate among other regions at about 5 percent.

For the best scenario the growth rate of international tourist arrivals to Cambodia demonstrates the highest significant and positive growth rate compared with the other two scenarios for every region. The highest tourist inflows to Cambodia are from Asia (41%) and the lowest rate from ASEAN (6%). At the present tourist arrivals to Cambodia are from ASEAN (36%), Oceania (7%), and Europe (38%).

5.2 Policy Implication and Further Study

The findings in this study could provide an important guideline for policy makers and planners not only for planning and policy formulation but also for investigating the movement/momentum of schemes and the evaluation of their impacts. Policies and their implication/implementation could arise from the results. The recommendations and suggestions from the study could be undertaken by the Ministry of Tourism in Cambodia, development partners and other departments in the Cambodian government toward the formulation and development of a tourism strategy plan in order to focus on the future growth of numbers of tourist arrivals to Cambodia.

5.2.1 Improve Service and Quality Standard

According to the findings in this study the GDP per capita in the previous year has significant and positive effect on the international tourist arrivals to Cambodia; especially from ASEAN, Oceania and North America. These groups of tourists are highly sensitive to income changes and are considered as luxury tourists. More importantly, the SARS epidemic in Asia has a statistically positive effect on tourists from every region. These tourists are likely to pay close attention in regards to relocating temporarily from any impacted area to a safe place. The implication is that international tourists from these regions demonstrate important features for tourism demand in Cambodia. The future policy suggestions below have been deduced from the above findings. They may assist in attracting more tourists to Cambodia:

1) Government should actively promote high quality and standard of health care service.

2) Government should have policies and programs to upgrade tourism facilities and infrastructures across the country as well as provide loans with low interest rates for investors to improve their tourist business activities.

3) Tourism goods and services suppliers should improve their product quality and services along with the hospitality. The suppliers should pay attention to human development as well as the standardization of services. Hospitality and tourist training programs are key elements in the improvement the quality of services.

4) Suppliers should improve their product lines within a standardized hospitality service structure; especially hotels, guesthouses, restaurants and

transportation.

5) Government should have a policy of retirement visa. This will especially encourage tourists from North America and Oceania groups as well as enable them to stay in Cambodia longer.

5.3 Monitor Relative Price in Cambodia

Based on the results relative price in Cambodia has negative effect on the tourist arrival from Oceania. In this context policy makers and suppliers must be careful with prices in order to maintain the competitiveness of their products. Therefore policy makers must carefully monitor all tourism goods and services providers including suppliers, restaurants, hotels, resorts, tourist souvenir shop and transportation to ensure they do not charge unreasonable prices for their goods and services.

5.4 Improve Security System and Prevent Internal Conflict in the Country

The study finds that internal conflict has a negative impact on tourism demand. Yet, SARS epidemic scheme and tsunami in Asia and in Japan had a positive effect on the Cambodian tourist industry when people from the impact areas travelled to a safe area. Disease and natural disaster are unpredictable events and happen suddenly but the implication should be to plan for such negative events. Therefore, the policy could be:

1) Government should solve any political deadlock in a peaceful way then broadcast about the stability and safe environment in Cambodia.

2) Present Cambodia as a friendly, welcoming and peaceful country by comparing and utilizing various features from Competitors; especially competitors in the region.

3) The policy makers should develop more strategic policies on tourist safety and security. They should adopt these security standards in tourism sites and provide information policies on tourism safety.

5.5 The Future Movement of Tourism Demand

The forecast results, using scenarios analysis, show that international tourism arrivals to Cambodia from ASEAN, Asia, Oceania, Europe, and North America will continue growth for the next three years for the normal scenario and the best scenario while slowing down for the worst scenario. If these results can be generalized to a series

of future years then the policy suggestions of this result are:

1) Cambodian government and Ministry of Tourism in Cambodia should increase the budget for research and development of tourism demand.

2) The policy makers and the tourism industry should invest in national resource as well as physical and human capital. The government should provide a higher standard of training, allocate budget for developing facilities and finance and/or support evolving projects for sustainable growth.

3) Government should extend the airline route between high income countries of origin and Cambodia.

Finally, the following is of interest for future research.

1) Substitute price variable is an interesting variable to investigate because the competitiveness of tourism price of countries having similar offerings for tourists enables them to capture tourists from Cambodia.

2) Using some time series models to forecast future visits of each country.

3) The methodologies used in this study could enable the exploration of other factors which might affect tourism demand through the addition more dummy variables of both individual countries and general events.

4) This study could be of more interest if a main speculative proposition outline is closely examined, e.g., "Why would the 1997 Asian financial crisis affect North America people the most and not people from ASEAN and Asia? What is the story behind this?"

There are many research and studies available on the relationship between Asia and the North American economy. They explore the reality of the economic recession in Asia affecting North America but few have truly sought to understand this relationship.

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APPENDICES

APPENDIX A:

Results of Fixed-Effect and Radom-Effect Models of the Total 26 Countries of Origin, ASEAN, Asia, Oceania, Europe and America

Appendix A.1: Fixed Effect result for the total 26 countries of origin

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11, fe						
Fixed-effect regression				Number of obs		442
Group variable : country code				Number of groups		26
R-sq:	Within	0.8080		Obs per group	Min	17
	Between	0.0002			Avg	17.0
	overall	0.0255			max	17
Corr(u_i,Xb)		-0.8236		F(14,402)		120.88
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	1.442161	.204301	7.06	0.000	1.040529	1.843793
lnrp	-.0058922	.0318765	-0.18	0.853	-.0685576	.0567733
lntc	.0500837	.1798023	0.28	0.781	-.3033866	.403554
D1	-.1004181	.101019	-0.99	0.321	-.2990096	.0981734
D2	-.1619068	.0961934	-1.68	0.093	-.3510118	.0271982
D3	.0066911	.0818428	0.08	0.935	-.1542022	.1675845
D4	-.1267489	.1177843	-1.08	0.283	-.3582991	.3213063
D5	.0894554	.1179373	0.76	0.449	-.1423955	.3213063
D6	1.027237	.1347919	7.62	0.000	.7622522	1.292222
D7	-.2170912	.0893946	-2.43	0.016	-.3928305	-.0413519
D8	1.412105	.1209575	11.67	0.000	1.174317	1.649893
D9	1.116508	.1383071	8.07	0.000	.8446122	1.388403
D10	.2446301	.1658438	1.48	0.141	-.0813993	.5706596
D11	.2835889	.2099709	1.35	0.178	-.1291893	.696367
_cons	-5.428251	2.63431	-2.06	0.040	-10.60699	-.2495071
Sigma_u	2.7468169					
Sigma_e	.42028374					
rho	.97712424	(fraction of variance due to u_i)				
F test that all u_i =0		F(25,402) = 172.26		Prob >F = 0.0000		

Panel A.2: Random Effect result for total 26 countries of origin

. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11, re						
Random–effects GLS regression				Number of obs		442
Group variable : countrycode				Number of groups		26
R-sq:	Within	0.8000		Obs per group	Min	17
	Between	0.0000			Avg	17.0
	overall	0.1148			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(14)		1571.81
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	.6601613	.1429665	4.62	0.00	.3799521	.9403705
lnrp	.0299476	.0310784	.96	0.335	-.0309649	.0908601
lntc	-.1198266	.1600741	-.75	0.454	-.433566	.1939128
D1	-.0927603	.1039329	-.89	0.372	-.2964651	.1109445
D2	-.1981569	.0944973	-2.10	0.036	-.3833681	-.0129456
D3	.0823023	.0828517	0.99	0.321	-.080084	.2446887
D4	-.169125	.120734	-1.40	0.161	-.4057594	.0675093
D5	.1210929	.1209487	1.00	0.317	-.1159622	.358148
D6	1.216776	.1297023	9.38	0.000	.9625628	1.470988
D7	-.2764521	.0887794	-3.11	0.002	-.4504566	-.1024476
D8	1.474207	.1230516	11.98	0.00	1.233031	1.715384
D9	1.357435	.1252562	10.84	0.00	1.111933	1.602933
D10	.2918369	.170289	1.71	0.087	-.0419233	.6255972
D11	.6578615	.1865459	3.53	0.000	.2922383	1.023485
_cons	3.891786	1.91091	2.04	0.042	.1464717	7.637101
Sigma_u	1.4139717					
Sigma_e	.42028374					
rho	.91882255	(fraction of variance due to u_i)				

Appendix A.3: Hausman Test result for the total 26 countries of origin

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	1.442161	.6601613	.7819996	.1459435
lnrp	-.0058922	.0299476	-.0358397	.0070883
lntc	.0500837	-.1198266	.1699103	.0818851
D1	-.1004181	-.0927603	-.0076578	.
D2	-.1619068	-.1981569	.0362501	.0179845
D3	.0066911	.0823023	-.0756112	.
D4	-.1267489	-.169125	.0423761	.
D5	.0894554	.1210929	-.0316375	.
D6	1.027237	1.216776	-.1895385	.0366882
D7	-.2170912	-.2764521	.0593608	.0104693
D8	1.412105	1.474207	-.0621021	.
D9	1.116508	1.357435	-.2409276	.0586491
D10	.2446301	.2918369	-.0472068	.
D11	.2835889	.6578615	-.3742727	.0963764

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic
Chi2(15) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 27.77
Prob>chi2 = 0.0153
(V_b-V_B is not positive definite)

Appendix A.4: Fixed Effect result for ASEAN

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11, fe						
Fixed-effects (within) regression				Number of obs		136
Group variable : country code				Number of groups		8
R-sq:	Within	0.7680		Obs per group	Min	17
	Between	0.0185			Avg	17.0
	overall	0.0002			max	17
Corr(u_i,Xb)		-0.9446		F(14,114)		26.95
				Prob>F		0.0000
lnq	Coef.	Std.Err.	T	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	2.964862	.6264352	4.73	0.000	1.723899	4.205852
lnrp	-.1946142	.559045	-0.35	0.278	-1.302078	.9128497
lntc	-.085186	.448921	-0.19	0.850	-.974495	.804123
D1	-.1174432	.2536508	-0.46	0.644	-.6199236	.3850371
D2	-.3063883	.2460639	-1.25	0.216	-.793839	.1810623
D3	-.1710896	.2107457	-0.81	0.419	-.5885752	.246396
D4	-.0256162	.2917942	-0.09	0.930	-.6036583	.5524258
D5	.0385317	.29376	0.13	0.896	-.5432262	.6202897
D6	.820886	.3288883	2.50	0.014	-.1693609	1.472411
D7	-.2864496	.2265803	-1.26	0.209	-.7353034	.1624043
D8	1.735597	.3003209	5.78	0.000	1.140663	2.33053
D9	.7035996	.3477634	2.02	0.045	.0146831	1.392516
D10	.3300369	.4131023	0.80	0.426	-.4883155	1.148389
D11	-.1561008	.5313998	-0.29	0.769	-1.2088	.8965981
_cons	-14.75941	6.344235	-2.33	0.022	-27.32729	-2.191523
Sigma_u	5.9054937					
Sigma_e	.57634752					
rho	.99056505	(fraction of variance due to u_i)				
F test that all u_i =0		F(7,114) = 87.90		Prob >F = 0.0000		

Appendix A.5: Random Effect result for ASEAN

. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11, re						
Random–effects GLS regression				Number of obs		136
Group variable : countrycode				Number of groups		8
R-sq:	within	0.7501		Obs per group	Min	17
	between	0.0586			Avg	17.0
	overall	0.0232			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(14)		320.62
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	1.605339	.5354974	3.00	0.003	.5557835	2.654895
lnrp	.4683617	.237159	1.97	0.048	.0035386	.9331848
lntc	-.261078	.3830167	-0.68	0.495	-1.011777	.4896209
D1	-.1813964	.265663	-0.68	0.459	-.7020862	.3392935
D2	-.4054679	.2371674	-1.71	0.087	-.8703074	.0593716
D3	-.1358135	.2157004	-0.63	0.529	-.5585785	.2869514
D4	-.1003532	.3087253	-0.33	0.745	-.7054436	.5047372
D5	.1067687	.310034	0.34	0.731	-.5008867	.7144242
D6	.9935848	.3287359	3.02	0.003	.4392742	1.637895
D7	-.307414	.2252209	-1.36	0.172	-.7488388	.1340108
D8	1.846864	.3149787	5.86	0.000	1.229517	2.464211
D9	1.026744	.3247194	3.14	0.002	.3850133	1.668474
D10	.4382725	.4368836	1.00	0.316	-.4180036	1.294549
D11	.4036354	.4863993	0.83	0.407	-.5496898	1.356961
_cons	.0289987	5.252033	0.01	0.996	-10.2648	10.32279
Sigma_u	1.6592828					
Sigma_e	.57634752					
rho	.89233911	(fraction of variance due to u_i)				

Appendix A.6: Hausman Test result for ASEAN

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	2.964862	1.605339	1.359523	.3250592
lnrp	-.1946142	.4683617	-.6629759	.5062479
lntc	-.085186	-.261078	.175892	.2341543
D1	-.1174432	-.1813964	.0639531	.
D2	-.3063883	-.4054679	.0990795	.0655674
D3	-.1710896	-.1358135	-.0352761	.
D4	-.0256162	-.1003532	.074737	.
D5	.0385317	.1067687	-.068237	.
D6	.820886	.9935848	-.1726988	.0100086
D7	-.2864496	-.307414	.0209644	.0247831
D8	1.735597	1.846864	-.111267	.
D9	.7035996	1.026744	-.3231439	.1172002
D10	.3300369	.4382725	-.1082355	.
D11	-.1561008	.4036354	-.5597362	.2140126

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic

Chi2(15) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 23.83
Prob>chi2 = 0.0481
(V_b-V_B is not positive definite)

Panel A.7: Fixed Effect result for Asia (EA+SA)

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, fe						
Fixed-effects (within) regression				Number of obs		85
Group variable : country code				Number of groups		5
R-sq:	within	0.8033		Obs per group	Min	17
	between	0.3112			Avg	17.0
	overall	0.0791			max	17
Corr(u_i,Xb)		-0.8751		F(13,67)		21.05
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	1.296057	.436152	2.97	0.004	.4254938	2.16662
lnrp	-.9093352	.5399647	-1.68	0.097	-1.987109	.1684389
lntc	.2873914	.2539292	1.13	0.262	-.2194534	.7942362
D1	-.000143	.259132	-0.00	1.000	-.5173727	.5170868
D2	-.1665466	.2214817	-0.75	0.455	-.6086259	.2755327
D3	-.0625744	.2013479	-0.31	0.757	-.4644664	.3393176
D4	-.2017029	.2743383	-0.74	0.465	-7492845	.3458787
D5	.091648	.2987664	0.31	0.760	-.5046923	.6879882
D6	.7837071	.2843502	2.76	0.008	.2161417	1.351273
D7	-.1009637	.2123803	-0.48	0.636	-.5248766	.3229492
D8	1.230828	.2978775	4.13	0.000	.6362621	1.825394
D9	.919813	.2034998	4.52	0.000	.5136256	1.326
D10	.1971347	.4214323	0.47	0.641	-.6440477	1.038317
_cons	-9.095525	4.817425	-1.89	0.063	-18.71115	.5200967
Sigma_u	1.9199157					
Sigma_e	.4669366					
rho	.94415372 (fraction of variance due to u_i)					
F test that all u_i =0		F(4,67) = 6.74		Prob >F = 0.0001		

Panel A. 8: Random Effect result for Asia (EA+SA)

. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, re						
Random–effects GLS regression				Number of obs		85
Group variable : countrycode				Number of groups		5
R-sq:	within	0.7627		Obs per group	Min	17
	between	0.1428			Avg	17.0
	overall	0.7098			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(13)		217.60
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	-.1460616	.1479148	-0.99	0.323	-.4359693	.1438461
lnrp	-.0459742	.1069837	-0.43	0.667	-.2556584	.16371
lntc	.3641315	.1884755	1.93	0.053	-.0052737	.7335366
D1	-.0743731	.2795291	-0.27	0.790	-.6222399	.4734938
D2	-.2268215	.2251105	-1.01	0.314	-.66803	.214387
D3	-.0520236	.2122537	-0.25	0.806	-.4680332	.3639859
D4	0.072781	.2815964	0.26	0.796	-.4791318	.624706
D5	.4147146	.293657	1.41	0.158	-.1608426	.9902718
D6	.9892265	.3027697	3.27	0.001	.3958087	1.582644
D7	-.2027515	.2201387	-0.92	0.357	-.6342153	.2287124
D8	1.317196	.3240081	4.07	0.000	.6821523	1.952241
D9	1.128412	.2112137	5.34	0.000	.7144411	1.542384
D10	.5551621	.4352415	1.28	0.202	-.2978955	1.40822
_cons	7.035861	2.071975	3.40	0.001	2.974864	11.09686
Sigma_u	.26644332					
Sigma_e	.4669366					
rho	.24562865 (fraction of variance due to u_i)					

Appendix A. 9: Hausman Test result for Asia (EA+SA)

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	1.296057	-.1460616	1.442118	.4103045
lnrp	-.9093352	-.0459742	-.863361	.5292602
lntc	.2873914	.3641315	-.0767401	.1701676
D1	-.000143	-.0743731	.0742301	.
D2	-.1665466	-.2268215	.0602749	.
D3	-.0625744	-.0520236	-.0105508	.
D4	-.2017029	.0727871	-.27449	.
D5	.091648	.4147146	-.3230667	.0550175
D6	.7837071	.9892265	-.2055193	.
D7	-.1009637	-.2027515	.1017877	.
D8	1.230828	1.317196	-.0863684	.
D9	.919813	1.128412	-.2085994	.
D10	.1971347	.5551621	-.3580274	.

b = consistent under H_0 and H_a; obtained from xtreg

B = inconsistent under H_a, efficient under H_0; obtained from xtreg

Test: H_0: different is coefficients not systematic

Chi2(15) = (b-B)′[(V_b-V_B)^(-1)](b-B)

= 17.91

Prob>chi2 = 0.1610

(V_b-V_B is not positive definite)

Appendix A.10: Fixed Effect result for Oceania

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, fe						
Fixed-effects (within) regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9932		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.7996			max	17
Corr(u_i,Xb)		0.3337		F(13,19)		214.46
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	2.673891	.6900226	3.88	0.001	1.229656	4.118125
lnrp	-.9879028	.2894902	-3.41	0.003	-1.593818	-.3819926
lntc	.3015917	.1328576	2.27	0.035	.0235175	.5796659
D1	.1013144	.0866297	1.17	0.257	-.0800036	.2826324
D2	.0415473	.0792369	0.52	0.606	-.1242975	.2073922
D3	.1811712	.092309	1.96	0.064	-.0120338	.3743762
D4	-.0472408	.0848211	-0.56	0.584	-.2247734	.1302917
D5	.1624641	.0939843	1.73	0.100	-.0342472	.3591755
D6	.6632764	.0984944	6.73	0.000	.4571254	.8694275
D7	-.178231	.0694558	-2.57	0.019	-.3236036	-.0328583
D8	.9012055	.0941865	9.57	0.000	.7040709	1.09834
D9	.5857958	.0746707	7.85	0.000	.4295083	.7420833
D10	.2831293	.1314421	2.15	0.044	.0080178	.5582407
_cons	-30.10805	5.501934	-5.47	0.000	-41.62373	-18.59237
Sigma_u	.7856896					
Sigma_e	.09050572					
rho	0.98690441 (fraction of variance due to u_i)					
F test that all u_i =0	F(1,19) = 25.60			Prob >F = 0.0001		

Appendix A.11: Random Effect result for Oceania

. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, re						
Random–effects GLS regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9845		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.9923			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(13)		2570.20
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	5.844046	.4315174	13.54	0.000	4.998287	6.689804
lnrp	-1.117489	.4305898	-2.60	0.009	-1.961429	-.2735484
lntc	-.3133585	.0800982	-3.91	0.000	-.4703481	-.156369
D1	.0981534	.1293575	0.76	0.048	-.1553827	.3516894
D2	-.1928842	0959811	-2.01	0.044	-.3810037	-.0047647
D3	-.0619214	.1176962	-0.53	0.599	-.2926018	.1687589
D4	-.0751722	.1263916	-0.59	0.552	-.3228952	.1725509
D5	.167817	.1403344	1.20	0.232	-.1072333	.4428673
D6	.4564327	.1338089	3.41	0.001	.1941721	.7186932
D7	-.2582172	.1009932	-2.56	0.011	-.4561602	-.0602742
D8	1.006161	.1371913	7.33	0.000	.7372714	1.275051
D9	.4585254	.104985	4.37	0.000	.2527586	.6642923
D10	.2601237	.1961601	1.33	0.185	-.1243431	.6445905
_cons	-56.15485	2.898029	-19.38	0.000	-61.83488	-50.47481
Sigma_u	0					
Sigma_e	0.09050572					
rho	0 (fraction of variance due to u_i)					

Appendix A.12: Hausman Test result for Oceania

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	2.673891	5.844046	-3.170155	.5384461
lnrp	-.9879028	-1.117489	.129586	.
lntc	.3015917	-.3133585	.61495502	.1059973
D1	.1013144	.0981534	.003161	
D2	.0415473	-.1928842	.2344316	.
D3	.1811712	-.0619214	.2430926	.
D4	-.0472408	-.0751722	.0279313	.
D5	.1624641	.167817	-.0053529	.
D6	.6632764	.4564327	.2068438	.
D7	-.178231	-.2582172	.0799862	.
D8	.9012055	1.006161	-.1049559	.
D9	.5857958	.4585254	.1272703	.
D10	.2831293	.2601237	.0230056	.

b = consistent under H_0 and H_a; obtained from xtreg

B = inconsistent under H_a, efficient under H_0; obtained from xtreg

Test: H_0: different is coefficients not systematic

Chi2(13) = (b-B)′[(V_b-V_B)^(-1)](b-B)

= 26.25

Prob>chi2 = 0.0157

(V_b-V_B is not positive definite)

Appendix A.13: Fixed Effect result for Europe

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, fe						
Fixed-effects (within) regression				Number of obs		153
Group variable : country code				Number of groups		9
R-sq:	within	0.9403		Obs per group	Min	17
	between	0.4652			Avg	17.0
	overall	0.1305			max	17
Corr(u_i,Xb)		-0.2743		F(13,131)		158.80
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	1.17799	.6221427	1.89	0.061	-.0527562	2.408737
lnrp	.0410439	.0178832	2.30	0.023	.0056666	.0764211
lntc	.3969016	.1143985	3.47	0.001	.1705941	.6232092
D1	-.0867031	.0903561	-0.96	0.339	-.265449	.0920428
D2	.0985289	.0859033	1.15	0.253	-.0714084	.2684662
D3	.1134876	.844255	1.34	0.181	-.0535261	.2805013
D4	-.0552757	.0908893	-0.61	0.544	-.2350763	.124525
D5	.1552169	.100043	1.55	0.123	-.0426919	.3531258
D6	1.201432	.1059531	11.34	0.000	.9918317	1.411033
D7	-.2222606	.0719097	-3.09	0.002	-.3645151	-.0800061
D8	1.304396	.0992637	13.14	0.000	1.108029	1.500763
D9	1.185971	.0672292	17.64	0.000	1.052976	1.318967
D10	.214189	.1392243	1.54	0.126	-.0612298	.4896078
_cons	-8.711176	5.567154	-1.56	0.120	-19.72434	2.301984
Sigma_u	1.3265148					
Sigma_e	.20815828					
rho	.97596752 (fraction of variance due to u_i)					
F test that all u_i =0		F(8,131) = 237.95		Prob >F = 0.0000		

Appendix A.14: Random Effect result for Europe

. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, re						
Random–effects GLS regression				Number of obs		153
Group variable : country code				Number of groups		9
R-sq:	within	0.9386		Obs per group	Min	17
	between	0.1884			Avg	17.0
	overall	0.3293			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(13)		1829.00
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	-.0203757	.5586268	-0.04	0.971	-1.115264	1.074513
lnrp	.042214	.0189246	2.23	0.026	.0051224	.0793055
lntc	.5643814	.11091	5.09	0.000	.3470017	.7817611
D1	-.0277761	.0943161	-0.29	0.768	-.2126324	.1570801
D2	.1803134	.0878531	2.05	0.040	.0081245	.3525024
D3	.2102025	.0848601	2.48	0.013	.0438798	.3765251
D4	-.0587826	.0964587	-0.61	0.542	-.2478381	.1302729
D5	.1176063	.1056159	1.11	0.265	-.0893971	.3246097
D6	1.272413	.1102359	11.54	0.000	1.056354	1.488471
D7	-.2147694	.0762983	-2.81	0.005	-.3643113	-.0652276
D8	1.290616	.105271	12.26	0.000	1.084289	1.496943
D9	1.20472	.0711037	16.94	0.000	1.065359	1.34408
D10	.1878582	.1475632	1.27	0.203	-.1013604	.4770767
_cons	1.863679	5.029886	0.37	0.711	-7.994716	11.72207
Sigma_u	.67388594					
Sigma_e	.20815828					
rho	.91289641 (fraction of variance due to u_i)					

Appendix A.15: Hausman Test result for Europe

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	1.17799	-.0203757	1.198366	.2738568
lnrp	.0410439	.042214	-.0011701	.
lntc	.3969016	.5643814	-.1674798	.0280354
D1	-.0867031	-.0277761	-.058927	.
D2	.0985289	.1803134	-.0817846	
D3	.1134876	.2102025	-.0967149	.
D4	-.0552757	-.0587826	.003507	.
D5	.1552169	.1176063	.0376106	
D6	1.201432	1.272413	.0709806	.
D7	-.222606	-.2147694	-.0074912	.
D8	1.304396	1.290616	.0137802	.
D9	1.185971	1.20472	-.0187485	.
D10	.214189	.1878582	.0263309	.

b = consistent under H_0 and H_a; obtained from xtreg

B = inconsistent under H_a, efficient under H_0; obtained from xtreg

Test: H_0: different is coefficients not systematic

Chi2(13) = (b-B)′[(V_b-V_B)^(-1)](b-B)

= 19.11

Prob>chi2 = 0.1198

(V_b-V_B is not positive definite)

Appendix A.16: Fixed Effect result for North America

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, fe						
Fixed-effects (within) regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9822		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.7747			max	17
Corr(u_i,Xb)		0.3593		F(13,19)		80.52
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	2.468304	1.237702	1.99	0.061	-.1222347	5.058844
lnrp	-.4439149	.2203703	-2.01	0.058	-.9051552	.0173254
lntc	.2143908	.22074	0.97	0.344	-.2476233	.6764049
D1	-.1586385	.1246345	-1.27	0.218	-.4195015	.1022 246
D2	-.0622919	.12829	-0.49	0.629	-.327748	.2031641
D3	.0244416	.1357869	0.18	0.859	-.2597636	.3086467
D4	-.060511	.1171898	-0.52	0.612	-.3057921	.18477
D5	.2198384	.1351168	1.63	0.120	-.0629643	.5026411
D6	.7651261	.1488657	5.14	0.000	.4535466	1.076706
D7	-.2744176	.0899947	-3.05	0.007	-.4627788	-.0860564
D8	.934994	.1279295	7.31	0.000	.6672345	1.202753
D9	.7436876	.090711	8.20	0.000	. 5538274	.9335479
D10	.3117022	.1816048	1.72	0.102	-.068401	.6918055
_cons	-22.45451	9.854332	-2.28	0.034	-43.07987	-1.829159
Sigma_u	.75360089					
Sigma_e	.12563428					
rho	.97295868 (fraction of variance due to u_i)					
F test that all u_i =0		F(1,19) = 15.25		Prob >F = 0.0010		

Appendix A.17: Random Effect result for North America

. xtreg lnq lngdppc(t-1) lnrp lntc d1 d2 d3 d4 d5 d6 d7 d8 d9 d10, re						
Random–effects GLS regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9635		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.9837			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(13)		1410.02
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	7.185955	.351733	20.43	0.000	6.496571	7.875339
lnrp	.0152075	.2438959	0.06	0.950	-.4628196	.4932347
lntc	-.5039633	.1596389	-3.16	0.002	-.8168497	-.1910769
D1	-.3923415	.1430591	-2.74	0.006	-.6727322	-.1119508
D2	-. 3566327	.1334725	-2.67	0.008	-.6182339	-. 0950315
D3	-.3416952	.1285215	-2.66	0.008	-.5935928	-.0897976
D4	-.086122	.1531117	-0.56	0.574	-.3862154	.2139715
D5	.323004	.173398	1.86	0.062	-.0168497	.6628578
D6	.4494064	.1635652	2.75	0.006	.1288245	.7699884
D7	-.2605801	.1176739	-2.21	0.027	-.4912166	-.0299435
D8	.9536307	. 1672893	5.70	0.000	.6257497	1.281512
D9	.6475425	.114246	5.67	0.000	.4236245	.8714605
D10	.3439706	.2373981	1.45	0.147	-.1213211	.8092622
_cons	-59.06082	3.974202	-14.86	0.000	-66.85012	-51.27153
Sigma_u	0					
Sigma_e	.12563428					
rho	0 (fraction of variance due to u_i)					

Appendix A.18: Hausman Test result for North America

.hausman fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	2.468304	7.185955	-4.717651	1.186671
lnrp	-.4439149	.015207	-.4591224	.
lntc	.2143908	-.5039633	.7183541	.1524519
D1	-.1586385	-.3923415	.233703	.
D2	-.0622919	-.3566327	.2943408	.
D3	.0244416	-.3416952	.3661368	.0438211
D4	-.060511	-.086122	.0256109	.
D5	.2198384	.323004	-.1031656	
D6	.7651261	.4494064	.3157196	.
D7	-.2744176	-.2605801	-.0138376	.
D8	.934994	.9536307	-.0186367	.
D9	.7436876	.6475425	.0961451	.
D10	.3117022	.3439706	-.0322683	.

b = consistent under H_0 and H_a; obtained from xtreg

B = inconsistent under H_a, efficient under H_0; obtained from xtreg

Test: H_0: different is coefficients not systematic

Chi2(13) = (b-B)′[(V_b-V_B)^(-1)](b-B)

= 15.53

Prob>chi2 = 0.2754

(V_b-V_B is not positive definite)

APPENDIX B:

Results of Fixed-Effect and Radom-Effect Models of the Total 26 Countries of Origin, ASEAN, Asia, Oceania, Europe and America, after being robustness check.

Appendix B.1: Fixed Effect result for the total 26 countries of origin

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) d2 d6 d7 d8 d9, fe						
Fixed-effect regression				Number of obs		442
Group variable : country code				Number of groups		26
R-sq:	Within	0.7955		Obs per group	Min	17
	Between	0.0002			Avg	17.0
	overall	0.0132			max	17
Corr(u_i,Xb)		-0.8993		F(6,410)		265.79
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	2.039487	.1581328	12.90	0.000	1.728635	2.350339
D2	-.2426946	.0725176	-3.35	0.001	-.3852472	-.100142
D6	.9562398	.1096099	8.72	0.000	.7407723	1.171707
D7	-.2875011	.0730942	-3.93	0.000	-.4311872	-.143815
D8	1.654733	.0705304	23.46	0.000	1.516087	1.793379
D9	.9725749	.0656435	14.82	0.000	.8435351	1.101615
_cons	-10.26224	1.48383	-6.92	0.000	-13.1791	-7.345376
Sigma_u	3.5777935					
Sigma_e	.42956681					
rho	.98578932	(fraction of variance due to u_i)				
F test that all u_i =0		F(25,410) = 171.69		Prob >F = 0.0000		

Panel B.2: Random Effect result for total 26 countries of origin

. xtreg lnq lngdppc(t-1) d2 d6 d7 d8 d9, re						
Random–effects GLS regression				Number of obs		442
Group variable : countrycode				Number of groups		26
R-sq:	Within	0.7777		Obs per group	Min	17
	Between	0.0002			Avg	17.0
	overall	0.0402			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(6)		1286.76
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	1.081182	.1252567	8.63	0.000	.8356836	1.326681
D2	-.3260858	.0780516	-4.18	0.000	-.4790642	-.1731075
D6	1.017188	.1187459	8.57	0.000	.7844499	1.249925
D7	-.3876887	.0783883	-4.95	0.000	-.541327	-.2340504
D8	1.811069	.074127	27.43	0.000	1.665783	1.956355
D9	.9737985	.0712551	13.67	0.000	.8341411	1.113456
_cons	-1.271593	1.210744	-1.05	0.294	-3.644608	1.101421
Sigma_u	1.3619358					
Sigma_e	.42956681					
rho	.90951851	(fraction of variance due to u_i)				

Appendix B.3: Hausman Test result for the total 26 countries of origin

.hausman Fixed.				
	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	2.039487	1.081182	.9583049	.0965232
D2	-.2426946	-.3260858	.0833912	.
D6	.9562398	1.017188	-.0609478	.
D7	-.2875011	-.3876887	.1001876	.
D8	1.654733	1.811069	-.156336	.
D9	.9725749	.9737985	-.0012236	.

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic
Chi2(6) = (b-B)′[(V_b-V_B)^(-1)](b-B)
= 98.57
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Appendix B.4: Fixed Effect result for ASEAN

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) d6 d8 d9, fe						
Fixed-effects (within) regression				Number of obs		136
Group variable : country code				Number of groups		8
R-sq:	Within	0.7534		Obs per group	Min	17
	Between	0.0202			Avg	17.0
	overall	0.0004			max	17
Corr(u_i,Xb)		-0.9214		F(4,124)		94.71
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	2.796483	.3516801	7.95	0.000	2.100409	3.492556
D6	.7501636	.209964	3.57	0.001	.334586	1.165741
D8	1.937695	.178764	10.84	0.000	1.583871	2.291519
D9	.8940495	.154167	5.80	0.000	.5889099	1.199189
_cons	-13.80209	2.77878	-4.97	0.000	-19.30208	-8.30211
Sigma_u	4.9758003					
Sigma_e	.56968304					
rho	.98706147	(fraction of variance due to u_i)				
F test that all u_i =0		F(7,124) = 147.96		Prob >F = 0.0000		

Appendix B.5: Random Effect result for ASEAN

. xtreg lnq lngdppc(t-1) d6 d8 d9, re						
Random–effects GLS regression				Number of obs		136
Group variable : countrycode				Number of groups		8
R-sq:	Within	0.7305		Obs per group	Min	17
	between	0.0282			Avg	17.0
	overall	0.0026			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(4)		286.91
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	1.566123	.2970754	5.27	0.000	.9838662	2.148381
D6	.7092275	.2315713	3.06	0.002	.2553561	1.163099
D8	2.256277	.1863858	12.11	0.000	1.890968	2.621586
D9	.9295857	.1699887	5.47	0.000	.596414	1.262757
_cons	-4.082611	2.444623	-1.67	0.095	-8.873984	.7087623
Sigma_u	1.7467865					
Sigma_e	.56968304					
rho	.9038632	(fraction of variance due to u_i)				

Appendix B.6: Hausman Test result for ASEAN

.hausman Fixed.				
	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	2.796483	1.566123	1.230359	.1882155
D6	.7501636	.7092275	.0409361	.
D8	1.937695	2.256277	-.3185816	.
D9	.8940495	.9295857	-.0355362	.

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic
Chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 42.73
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Panel B.7: Fixed Effect result for Asia (EA+SA)

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lntc d6 d8 d9, fe						
Fixed-effects (within) regression				Number of obs		85
Group variable : country code				Number of groups		5
R-sq:	within	0.7734		Obs per group	Min	17
	between	0.1452			Avg	17.0
	overall	0.4863			max	17
Corr(u_i,Xb)		-0.4428		F(4,76)		64.86
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lntc	.7188461	.0951732	7.55	0.000	.5292922	.9084
D6	.8370527	.2196465	3.81	0.000	.3995888	1.274517
D8	1.399966	.1841839	7.60	0.000	1.033132	1.768
D9	1.013518	.1628705	6.22	0.000	.6891331	1.337902
_cons	1.79177	1.092145	1.64	0.105	-.3834175	3.966971
Sigma_u	.66358644					
Sigma_e	.47057478					
rho	.66539019 (fraction of variance due to u_i)					
F test that all u_i =0	F(4,76) = 17.25			Prob >F = 0.0000		

Panel B.8: Random Effect result for Asia (EA+SA)

. xtreg lnq lntc d6 d8 d9, re						
Random–effects GLS regression				Number of obs		85
Group variable : countrycode				Number of groups		5
R-sq:	within	0.7676		Obs per group	Min	17
	between	0.1452			Avg	17.0
	overall	0.5311			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(4)		231.83
				Prob>chi2		0.0000

lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lntc	.5741511	.093663	6.13	0.000	.390575	.7577272
D6	.8122669	.2366049	3.43	0.001	.3485298	1.276004
D8	1.536702	.1945245	7.90	0.000	1.155441	1.917963
D9	1.053513	.1751449	6.02	0.000	.7102353	1.396791
_cons	3.449629	1.083372	3.18	0.001	1.32626	5.572999
Sigma_u	.27648472					
Sigma_e	.47057478					
rho	.25662235 (fraction of variance due to u_i)					

Appendix B.9: Hausman Test result for Asia (EA+SA)

.hausman Fixed.				
	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lntc	.7188461	.5741511	.144695	.0168875
D6	.8370527	.8122669	.0247858	.
D8	1.399966	1.536702	-.1367368	.
D9	1.013518	1.053513	-.0399953	.

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic
Chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 73.41
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Appendix B.10: Fixed Effect result for Oceania

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lnrp lntc d3 d5 d6 d7 d8 d9 d10, fe						
Fixed-effects (within) regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9926		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.8210			max	17
Corr(u_i,Xb)		0.3600		F(10,22)		293.67
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	2.913219	.5541406	5.26	0.000	1.764002	4.062436
lnrp	-.835127	.2550159	-3.27	0.003	-1.363998	-.3062564
lntc	.2650345	.0976378	2.71	0.013	.0625461	.467523
D3	.1390133	.0725132	1.92	0.068	-.0113699	.2893965
D5	.2301061	.0737249	3.12	0.005	.07721	.3830021
D6	.651858	.0861083	7.57	0.000	.4732804	.8304357
D7	-.171918	.066681	-2.58	0.017	-.310206	-.03363
D8	.8631055	.0801709	10.77	0.000	.6968411	1.02937
D9	.6112994	.0641906	9.52	0.000	.4781763	.7444225
D10	.3475013	.11631	2.99	0.007	.106289	.5887135
_cons	-30.89169	4.599416	-6.72	0.000	-40.4303	-21.35309
Sigma_u	.74890891					
Sigma_e	.08815498					
rho	0.98633343 (fraction of variance due to u_i)					
F test that all u_i =0	F(1,22) = 37.59			Prob >F = 0.0000		

Appendix B.11: Random Effect result for Oceania

. xtreg lnq lngdppc(t-1) lnrp lntc d3 d5 d6 d7 d8 d9 d10, re						
Random–effects GLS regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9806		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.9902			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(10)		2326.86
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	5.926239	.4120747	14.38	0.000	5.118588	6.733891
lnrp	-1.089131	.4050141	-2.69	0.007	-1.882944	-.2953175
lntc	-.2705935	.0701639	-3.86	0.000	-.4081121	-.1330749
D3	-.0002894	.1108376	-0.00	0.998	-.217527	.2169482
D5	.2428892	.1186183	2.05	0.041	.0104017	.4753768
D6	.5203554	.1342289	3.88	0.000	.2572716	.7834392
D7	-.2636288	.1045925	-2.52	0.012	-.4686264	-.0586312
D8	.9371321	.1275692	7.35	0.000	.687101	1.187163
D9	.4993731	.0990528	5.04	0.000	.3052332	.693513
D10	.33481664	.18871802	1.79	0.074	-.0320499	.7016828
_cons	-57.3327	2.572463	-22.29	0.000	-62.37464	-52.29077
Sigma_u	0					
Sigma_e	.08815498					
rho	0 (fraction of variance due to u_i)					

Appendix B.12: Hausman Test result for Oceania

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	2.913219	5.926239	-3.01302	.3704946
lnrp	-.835127	-1.089131	.2540036	.
lntc	.2650345	-.2705935	.5356281	.0678983
D3	.1390133	-.0002894	.1393027	.
D5	.2301061	.2428892	-.0127832	.
D6	.651858	.5203554	.1315026	.
D7	-.171818	-.2636288	.0917108	.
D8	.8631055	.9371321	-.0740266	.
D9	.6112994	.4993731	.1119263	.
D10	.3475013	.3348164	.0126848	.

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic

Chi2(10) = (b-B)′[(V_b-V_B)^(-1)](b-B)
= 39.58
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Appendix B.13: Fixed Effect result for Europe

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lnrp lntc d2 d3 d6 d7 d8 d9, fe						
Fixed-effects (within) regression				Number of obs		153
Group variable : country code				Number of groups		9
R-sq:	within	0.9366		Obs per group	Min	17
	between	0.3094			Avg	17.0
	overall	0.3208			max	17
Corr(u_i,Xb)		-0.0225		F(8,136)		250.97
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lnrp	.0493868	.0178192	2.77	0.006	.0141482	.0846255
lntc	.6172645	.0515273	11.98	0.000	.5153661	.7191629
D2	.2029301	.0731762	2.77	0.006	.0582197	.3476405
D3	.2171828	.0676189	3.21	0.002	.0834624	.3509032
D6	1.263356	.096499	13.09	0.000	1.072524	1.454189
D7	-.2065931	.0719883	-2.87	0.005	-.3489543	-.0642318
D8	1.380805	.0629738	21.93	0.000	1.25627	1.505339
D9	1.180316	.05688	20.75	0.000	1.067832	1.2928
_cons	1.067982	.6286423	1.70	0.092	-.1751963	2.31116
Sigma_u	1.1224681					
Sigma_e	.21064737					
rho	.96598016 (fraction of variance due to u_i)					
F test that all u_i =0		F(8,136) = 359.04		Prob >F = 0.0000		

Appendix B.14: Random Effect result for Europe

. xtreg lnq lnrp lntc d2 d3 d6 d7 d8 d9, re						
Random–effects GLS regression				Number of obs		153
Group variable : country code				Number of groups		9
R-sq:	within	0.9365		Obs per group	Min	17
	between	0.2755			Avg	17.0
	overall	0.3237			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(8)		1852.69
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lnrp	.0456119	.0185133	2.46	0.014	.0093265	.0818937
lntc	.6153478	.0536283	11.47	0.000	.5102382	.7204574
D2	.2008187	.0761631	2.64	0.008	.0515418	.3500956
D3	.2152916	.0703791	3.06	0.002	.0773512	.3532321
D6	1.256672	.1004231	12.51	0.000	1.059846	1.453497
D7	-.2022578	.0749199	-2.70	0.007	-.3490981	-.0554175
D8	1.381416	.0655466	21.08	0.000	1.252947	1.509885
D9	1.178608	.0592022	19.91	0.000	1.062574	1.294643
_cons	1.062133	.6988037	1.52	0.129	-.3074973	2.431763
Sigma_u	.70709092					
Sigma_e	.21064737					
rho	.91848567 (fraction of variance due to u_i)					

Appendix B.15: Hausman Test result for Europe

.hausman random.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lnrp	.0456119	.0493868	-.0037749	.0050217
lntc	.6153478	.6172645	-.0019167	.0148639
D2	.2008187	.2029301	-.0021114	.02112
D3	.2152916	.2171828	-.0018912	.0195168
D6	1.256672	1.263356	-.0066846	.027798
D7	-.2022578	-.2065931	-.0043353	.0207528
D8	1.381416	1.380805	.0006106	.0181842
D9	1.178608	1.180316	-.0017074	.0164182

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic

Chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.57
Prob>chi2 = 0.9998
(V_b-V_B is not positive definite)

Appendix B.16: Fixed Effect result for North America

. xtset country code year						
panel variable: country code (strongly balanced)						
time variable: year, 1996 to 2012						
delta: 1 unit						
. xtreg lnq lngdppc(t-1) lntc d1 d2 d3 d5 d6 d7 d8 d9, fe						
Fixed-effects (within) regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9757		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.8659			max	17
Corr(u_i,Xb)		0.4753		F(10,22)		88.52
				Prob>F		0.0000
lnq	Coef.	Std.Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc (t-1)	3.09676	1.186918	2.61	0.016	.6352424	5.558278
lntc	.2016778	.2187708	0.92	0.367	-.2520252	.6553808
D1	-.1323716	.1145328	-1.16	0.260	-.369898	.1051549
D2	-.0491418	.1336982	-0.37	0.717	-.326415	.2281313
D3	.0356962	.1432995	0.25	0.806	-.2614888	.3328812
D5	.0695043	.0985359	0.71	0.488	-.1348467	.2738553
D6	.7640795	.1575478	4.85	0.000	.4373453	1.090814
D7	-.2559645	.0968353	-2.64	0.015	-.4567886	-.0551403
D8	1.0531183	.1031287	10.21	0.000	.8393072	1.267059
D9	.7569419	.0888852	8.52	0.000	.5726053	.9412785
_cons	-25.24591	9.930295	-2.54	0.019	-45.84008	-4.651738
Sigma_u	.60229516					
Sigma_e	.13617672					
rho	.95136658 (fraction of variance due to u_i)					
F test that all u_i =0	F(1,22) = 12.18			Prob >F = 0.0021		

Appendix B.17: Random Effect result for North America

. xtreg lnq lngdppc(t-1) lntc d1 d2 d3 d5 d6 d7 d8 d9, re						
Random–effects GLS regression				Number of obs		34
Group variable : country code				Number of groups		2
R-sq:	within	0.9634		Obs per group	Min	17
	between	1.0000			Avg	17.0
	overall	0.9836			max	17
Corr(u_i,X)		0 (assumed)		Wald chi2(10)		1379.66
				Prob>chi2		0.0000
lnq	Coef.	Std.Err.	Z	P>|Z|	[95% Conf.	Interval]
lngdppc (t-1)	7.154781	.2894016	24.72	0.000	6.587555	7.722006
lntc	-.475046	.1234177	-3.85	0.000	-.7169403	-.2331518
D1	-.2819548	.1294665	-2.18	0.029	-.5357046	-.0282051
D2	-.3431568	.1265394	-2.71	0.007	-.5911694	-.0951442
D3	-.3342373	.1175283	-2.84	0.004	-.5645884	-.1038861
D5	.1941795	.1119398	1.73	0.083	-.0252185	.4135776
D6	.4410449	.1553977	2.84	0.005	.136471	.7456188
D7	-.2497642	.1180212	-2.12	0.034	-.4810815	-.0184468
D8	1.165777	.1194011	9.76	0.000	.9317549	1.399798
D9	.6376382	.1000139	6.38	0.000	.4416146	.8336619
_cons	-59.22065	2.380735	-24.87	0.000	-63.8868	-54.55449
Sigma_u	0					
Sigma_e	.13617672					
rho	0 (fraction of variance due to u_i)					

Appendix B.18: Hausman Test result for North America

.hausman Fixed.

	---- Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_b-V_B) S.E.
lngdppc (t-1)	3.09676	7.154781	-4.058021	1.151095
lntc	.2016778	-.475046	.6767238	.1806343
D1	-.1323716	-.2819548	.1495833	.
D2	-.0491418	-.3431568	.294015	.0431625
D3	.0356962	-.3342373	.3699335	.081987
D5	.0695043	.1941795	-.1246752	
D6	.7640795	.4410449	.3230346	.0259397
D7	-.2559645	-.2497642	-.0062003	.
D8	1.053183	1.165777	-.1125937	.
D9	.7569419	.6376382	.1193037	.

b = consistent under H_0 and H_a; obtained from xtreg
B = inconsistent under H_a, efficient under H_0; obtained from xtreg
Test: H_0: different is coefficients not systematic

Chi2(10) = (b-B)′[(V_b-V_B)^(-1)](b-B)
= 12.41
Prob>chi2 = 0.2588
(V_b-V_B is not positive definite)

APPENDIX

Results of Forecasting International Tourist Arrivals to Cambodia

During 2014-2017

Appendix 19: Results of forecasting international tourist arrivals to Cambodia from ASEAN

The worst scenario				
GQ(ASEAN)	Coefficient	GDPPC	GQ(ASEAN)	TQ (%)
	2.796	-0.1439	-0.4023444	-40%
Forecasting				
Year	TQ	GQ		
2012	1,509,523	-0.4023		
2013	902,175	-0.4023		
2014	539,190	-0.4023		
2015	322,250	-0.4023		
2016	192,594	-0.4023		
2017	115,105	-0.4023		
Normal Scenario				
GQ(ASEAN)	Coefficient	GDPPC	TQ	TQ (%)
	2.796	0.0283	0.079127	8%
Forecasting				
Year	TQ	GQ		
2012	1,509,523	0.0791		
2013	1,628,967	0.0791		
2014	1,757,862	0.0791		
2015	1,896,956	0.0791		
2016	2,047,056	0.0791		
2017	2,209,033	0.0791		
The best scenario				
GQ (Asia)	Coefficient	GTC	TQ	TQ (%)
	0.719	0.5679	0.4083201	21%
Forecasting				
Year	TQ	GQ		
2012	1,036,522	0.4083		
2013	1,459,755	0.4083		
2014	2,055,802	0.4083		
2015	2,895,227	0.4083		
2016	4,077,407	0.4083		
2017	5,742,294	0.4083		

Appendix 20: Results of forecasting international tourist arrivals to Cambodia from Asia (EA+SA)

The worst scenario				
GQ(Asia)	Coefficient	GTC	TQ	TQ(%)
	0.719	-0.3775	-0.2714225	-27%
Forecasting				
Year	TQ	GQ		
2012	1,036,522	-0.2714		
2013	755,187	-0.2714		
2014	550,212	-0.2714		
2015	400,872	-0.2714		
2016	292,066	-0.2714		
2017	212,793	-0.2714		
The normal scenario				
GQ(Asia)	Coefficient	GTC	TQ	TQ (%)
	0.719	0.1266	0.091025	9%
Forecasting				
Year	TQ	GQ		
2012	1,036,522	0.0910		
2013	1,130,872	0.0910		
2014	1,233,810	0.0910		
2015	1,346,118	0.0910		
2016	1,468,649	0.0910		
2017	1,602,333	0.0910		
The best scenario				
GQ (Asia)	Coefficient	GTC	TQ	TQ (%)
	0.719	0.5679	0.4083201	21%
Forecasting				
Year	TQ	GQ		
2012	1,036,522	0.4083		
2013	1,459,755	0.4083		
2014	2,055,802	0.4083		
2015	2,895,227	0.4083		
2016	4,077,407	0.4083		
2017	5,742,294	0.4083		

Appendix 21: Results of forecasting international tourist arrivals to Cambodia from Oceania

The worst scenario						
GQ (Oceania)	Coefficient	GGDPPC	RP	TC	TQ	TQ(%)
	2.913	-0.0278			-0.0810	
	-0.835		-0.2151		0.1796	
	0.265			-0.3775	-0.1000	
					-0.0014	-0.14%

Forecasting		
Year	TQ	GQ
2012	136,773	-0.0014
2013	136,580	-0.0014
2014	136,387	-0.0014
2015	136,195	-0.0014
2016	136,003	-0.0014
2017	135,811	-0.0014

The normal Scenario						
GQ(Oceania)	Coefficient	GGDPPC	RP	TC	TQ	TQ (%)
	2.913	0.0167			0.0486	
	-0.835		-0.0064		0.0053	
	0.265			0.1266	0.0335	
					0.0875	9%

Forecasting		
Year	TQ	GQ
2012	136,773	0.0875
2013	148,746	0.0875
2014	161,767	0.0875
2015	175,929	0.0875
2016	191,329	0.0875
2017	208,078	0.0875

The best scenario						
GQ (Oceania)	Coefficient	GGDPPC	RP	TC	TQ	TQ(%)
	2.913	0.0457			0.1331	
	-0.835		0.2578		-0.2153	
	0.265			0.5679	0.1505	
					0.0684	7%
Forecasting						
Year	TQ	GQ				
2012	136,773	0.0684				
2013	146,122	0.0684				
2014	156,110	0.0684				
2015	166,781	0.0684				
2016	178,181	0.0684				
2017	190,361	0.0684				

Appendix 22: Results of forecasting international tourist arrivals to Cambodia from Europe

The worst scenario					
GQ(EU)	Coefficient	RP	TC	TQ	TQ(%)
	0.045	-0.9995		-0.0450	
	0.615		-0.3775	-0.2322	
				-0.2771	-28%
Forecasting					
Year	TQ	GQ			
2012	401,893	-0.2819			
2013	288,602	-0.2819			
2014	207,247	-0.2819			
2015	148,826	-0.2819			
2016	106,873	-0.2819			
2017	76,746	-0.2819			

The normal scenario					
GQ(EU)	Coefficient	RP	TC	GQ	GQ(%)
	0.045	-0.0176		-0.0008	
	0.615		0.1266	0.0779	
				0.0771	8%
Forecasting					
Year	TQ	GQ			
2012	401,893	0.0772			
2013	432,939	0.0772			
2014	466,384	0.0772			
2015	502,412	0.0772			
2016	541,223	0.0772			
2017	583,032	0.0772			
The best scenario					
GQ(EU)	Coefficient	GRP	TC	GQ	GQ (%)
	0.045	0.6593		0.0297	
	0.615		0.5679	0.3493	
				0.3789	38%
Forecasting					
Year	TQ	GQ			
2012	401,893	0.3827			
2013	555,697	0.3827			
2014	768,363	0.3827			
2015	1,062,415	0.3827			
2016	1,469,002	0.3827			
2017	2,031,189	0.3827			

Appendix 23: Results of forecasting international tourist arrivals to Cambodia from North America

The worst scenario					
GQ(NA)	Coefficient	GDPPC	TC	GQ	GQ(%)
	7.154	-0.0395		-0.2826	
	-0.475		0.5679	-0.2698	
				-0.5523	-55%
Forecasting					
Year	TQ	GQ			
2012	220,905	-0.5524			
2013	98,883	-0.5524			
2014	44,262	-0.5524			
2015	19,813	-0.5524			
2016	8,869	-0.5524			
2017	3,970	-0.5524			
The normal scenario					
GQ (NA)	Coefficient	GDPPC	TC	TQ	TQ (%)
	7.154	0.0155		0.1109	
	-0.475		0.1266	-0.0601	
				0.0508	5%
Forecasting					
Year	TQ	GQ			
2012	220,905	0.0508			
2013	232,120	0.0508			
2014	243,904	0.0508			
2015	256,286	0.0508			
2016	269,297	0.0508			
2017	282,969	0.0508			
The best scenario					
GQ (NA)	Coefficient	GDPPC	TC	TQ	TQ (%)
	7.154	0.0466		0.3334	
	-0.475		0.5679	-0.2698	
				0.0636	6%
Forecasting					
Year	TQ	GQ			
2012	220,905	0.0637			
2013	234,970	0.0637			
2014	249,931	0.0637			
2015	265,844	0.0637			
2016	282,770	0.0637			
2017	300,775	0.0637			

CURRICULUM VITAE

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