Faculty of Graduate Studies

Department of Economics

Tourism Demand: Evidence from Turkey

الطلب على السياحة: دراسة الحالة التركية

Prepared by:

Fadel Naeem – 1145047

Thesis Committee Members:

Dr. Mohanad Ismael (Supervisor)

Dr. Tareq Sadeq

Dr. Shaker Sarsour

"This thesis was submitted in partial fulfillment of the requirements for the master's degree in Economics from the faculty of graduate studies at Birzeit University, Palestine".

1st Feb 2020

Faculty of Graduate Studies

Department of Economics

Tourism Demand: Evidence from Turkey

الطلب على السياحة: دراسة الحالة التركية

Prepared by:

Fadel Naeem – 1145047

Thesis Committee Members:

*Dr. Mohanad Ismael (Supervisor)*_____

Dr. Tareq Sadeq _____

*Dr. Shaker Sarsour*_____

"This thesis was submitted in partial fulfillment of the requirements for the master's degree in Economics from the faculty of graduate studies at Birzeit University, Palestine".

1st Feb 2020

Dedication

“This thesis is dedicated to: my parents, my colleagues and friends who have always supported me in my long educational journey. I take this opportunity to express gratitude to my professors at Birzeit University who gave me unconditional support. I would like to thank Dr. Mohanad Ismael, for his patience, advice and encouragement”.

Abstract

Tourism industry, became one of the most rapidly expanding industries in the world. Tourism started to catch additional attention by countries for its role not only in promoting country's image and identity, but also in contributing towards numerous economic benefits through stimulating growth, development and providing additional income directly through job creation and indirectly through the investment going into the industry.

Given its incomparable history and cultural appeal, there is no doubt that Turkey; a modernized Muslim country has always been a popular touristic destination, nowadays, after years of extensive investments by both the public and private sectors. Turkey is ranked 6th worldwide as the most visited destinations by international tourists in 2017, thus, it is important to examine the drivers that affected the influx of the tourists on Turkey in order to understand Turkey's recipe of success in this industry.

In this paper we examined the quantitative factors using ARDL model to establish a long run relationship between tourism demand in Turkey from the top three countries visiting Turkey (namely UK, Germany and Russia) with the Turkish Government Spending, GDP per Capita for the top three countries and Tourism Price Index and two dummy variables one representing seasonality and the other representing political and natural disasters shocks. The study uses a quarterly time-series from 1996 to 2018.

Despite the importance of qualitative factors affecting tourism such as Turkey's unique and strategic location lying partly in Asia and partly in Europe where East meets West, varied climate and good weather, natural resources, beautiful nature and unique coastal fringes, delicious cuisine, manufacturing activities, the availability of historical and cultural monuments, as well as economic and political stability. Yet all of these factors are less effective without government's

serious effort and intervention to promote the industry, building the needed infrastructure and stimulating growth while simultaneously marinating a competitive price for tourism, stable political and economic climate. Those are the main findings of this paper.

الملخص

اصبحت السياحة احدى اسرع القطاعات نموا في العالم. وبدات في جلب المزيد من الاهتمام من قبل الدول لدورها في تعزيز ونشر ثقافة هذه البلدان واثرها الاقتصادي الكبير من خلال تعزيز النمو الاقتصادي وخلص فرص عمل مباشرة وغير مباشرة.

بالنظر الى الحالة التركية وتاريخها وثقافتها وجذابيتها الطبيعية, فلا شك بان تركيا كانت ولا زالت وجهة سياحية بارزة, وفي الوقت الحاضر, بعد سنوات طويلة من الاستثمارات الضخمة في البنية التحتية الداعمة لقطاع السياحة من قبل القطاعين الخاص والحكومي في تركيا, اصبحت تركيا تحتل المركز السادس في العالم من حيث عدد السواح الوافدين, وعليه اصبح من الضروري دراسة الحالة التركية وفهم اهم الخصائص التي اثرت على النهضة السياحية في تركيا.

في هذه الدراسة, تم دراسة العوامل الكمية باستخدام نموذج اقتصادي كمي لايجاد علاقة طويلة الامد بين الطلب على السياحة في تركيا من اكثر البلدان الزائرة لتركيا (بريطانيا, روسيا, المانيا) مع الانفاق الحكومي التركي, نصيب الفرد من الناتج المحلي الاجمالي من الدول الزائرة, مؤشر اسعار السياحة في تركيا, ومؤشر متعلق بالموسمية السياحية (صيف وشتاء) ومؤشر متعلق باهم الاحداث السياسية والكوارث الطبيعية التي قد تؤثر على اعداد السواح. استخدمت هذه الدراسة بيانات ربعية من العام 1996 حتى العام 2018.

وعلى الرغم من اهمية العوامل الكمية على السياحة التركية, لكن لا يمكن تجاهل العوامل النوعية التي تؤثر على الطلب على السياحة في تركيا, كموقعها الجغرافي الفريد الرابط بين الشرق والغرب, والمناخ المعتدل, والتنوع الجغرافي والطبيعي والثقافي.

Abbreviations

“ADF: Augmented Dickey-Fuller

AIC: Akaike Information Criterion

ARDL: Autoregressive Distributed Lag

CUSUM: Cumulative Sum

CUSUMSQ: Cumulative Sum of Squares

ECM: Error Correction Model

ECT: Error Correction Term

G: Government Spending

GDP: Gross Domestic Product

GDPpC: GDP per Capita

Ln: Natural Logarithm

Sampled Countries: United Kingdom, Russia, Germany

TD: Tourism Demand

TP: Tourism Price”

Table of Contents

Dedication ii
Abstract iv
Abbreviations vii
List of Figures ix
List of Tables ix
Chapter 1: Introduction 1
1.1 Preface 1
1.2 Problem Statement 3
1.3 Study Objectives and Importance 4
1.4 Study Limitations 4
1.5 Study Contents 4
Chapter 2: Overview of the Turkish Economy and Tourism Industry 5
Chapter 3: Literature Review 15
Chapter 4: Methodology 25
Chapter 5: Analysis and Findings 30
6.1 Unit Root Test Results 30
6.2 Co-integration Test Results 32
6.3 Long-Run Elasticity 33
6.4 Short-Run Elasticity 35
Model Stability 37
Chapter 6: Conclusions and Recommendations 38
References 40
Appendix 42
Table 1: Raw Data 42
Table 2: ADF tests at level 47
Table 3: ADF tests at 1st difference 51
Table 4: ARDL 55
Table 5: Long Run Model 56
Table 6: Short Run Model 57
Table 7: Optimal Lag Structure 58

List of Figures

Figure 1: Yearly Tourists Arrival to Turkey from 1996 to 2018 3

Figure 2: Quarterly Tourists from UK, Russia, Germany 10

Figure 3: Turkey GDP per Capita from 1996 to 2018 12

Figure 4: Turkey flow of Goods, Exports and Imports 12

Figure 5: Turkey Government Spending from 1996 to 2018 13

Figure 6: International tourist arrivals in Turkey from 1996 to 2018 13

Figure 7: Quarterly Cross-Sectional Data of Tourists and Turkish Government Spending 14

Figure 8: Visual representation of ADF Test at Levels 31

Figure 9: Visual representation of ADF Test for the 1st Difference 31

Figure 10: CUSUM. Cumulative Sum Plot 37

Figure 11: CUSMSQ, Cumulative Sum of Squares Plot 37

List of Tables

Table 1: ADF Test for Levels 30

Table 2: ADF Test for the 1st Difference 31

Table 3: F-test for Co-integration 32

Table 4: Long-Run Estimation Results 33

Table 5: Short-Run Estimation Results 35

Chapter 1: Introduction

1.1 Preface

Tourism became one of the most important contributors to country's economic development, it benefits economies through job creation and income generation, thus, it is one of the main sources of welfare for any nation. As easy as this sounds, yet the ability for a country to benefit from such opportunity depends on so many variables like the availability of investments to support necessary expansion of infrastructure needed to attract tourists *(Tourism an Important Sector of Economy Development, 2009).*

The tourism industry also known as travel industry is a massive growth-oriented industry, that functions through a network of related and inter-connected industries which aims to assist travelers and tourists.

Tourism is associated to the notion of people traveling to other locations and destinations, either domestically or internationally, for business, leisure or even personal purposes, in addition to other motivators; such as cultural curiosity, the aspiration of self-improvement, visiting family members and friends. It goes without saying that in order for a traveler to be considered as a tourist, she/he is supposed to stay at the destination for more than 24 hours and less than a year.

While business travelers are usually categorized as tourists, it is worth noting that many definitions of the word exclude those who travel with the intention of making an income in the place they are traveling to, since the rationale behind their voyage is not to enjoy the destinations' services. Also, because business travelers have no decision in choosing the timing and destination of their voyage.

Tourism industry is made up from different sectors, sub-industries and components; Tourism industry brings up all activities related to the short-term movement of travelers to

destinations away from where they usually live such as transportation, entertainment attractions, shopping, and much more. It is one of the world's leading industries and several nations' economies are driven by their tourist trade. Looking at the tourism and travel industry one foretells two sides of the coin; demand and supply, where all those tourism- related activities; services and products consumed during the tourists' stay consist the demand side. whereas the sum of all services, products and industries provided by the hosting country consist the supply side.

The Republic of Turkey; a significant destination enjoying a rapid tourism evolution sets a great example, henceforth, this paper will focus on the Turkish experience as a neighbor country which has become one of the top tourism destinations globally and was able to dramatically change its economic situation during the last two decades.

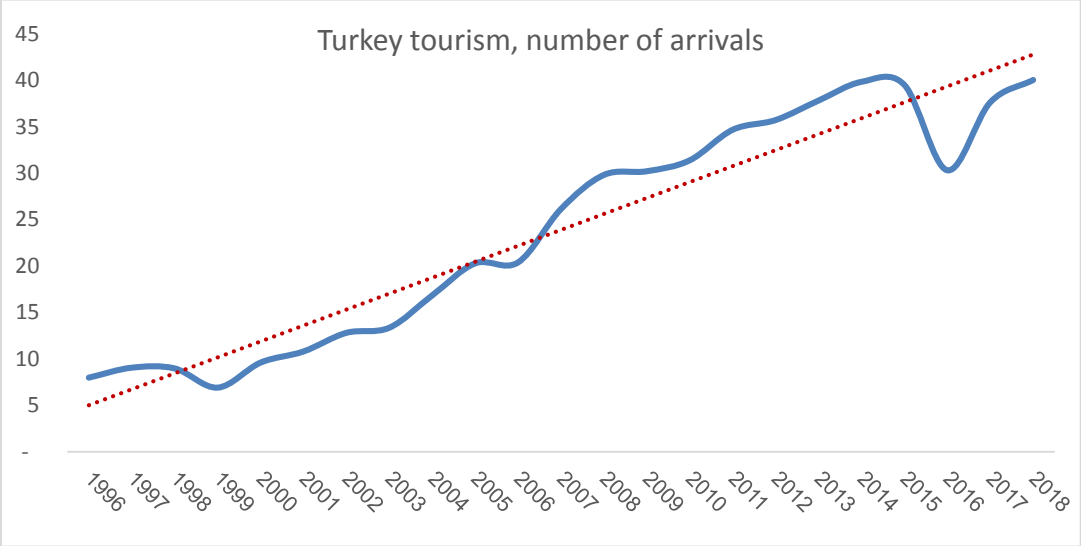
Nowadays, the Turkish economy is highly dependent on the tourism sector, which is one of the fastest expanding industries in the Turkish economy. Every year, the country spends billions of dollars ($4.0B is the average annual government spending on tourism for the last 10 years equivalent to 4% of total government spending) to advertise the best tourism destinations with the aim of attracting millions of visitors *(International Monetary Fund , 2017)*. Therefore, it is imperative to investigate what drives tourism demand. The literature review will focus on several matters including understanding the historical background of Turkey's tourism and sustainability of the sector. Moreover, it will focus on the government's efforts to increase the competitiveness of Turkey's tourism industry in the dynamic environment.

Political tensions, warfares, coups and internal security situations all causes problematic and safety concerns for tourists and the attraction of visitors. Turkey's tourism industry suffered on several occasions as a result of many security and political concerns beginning in late 2015, following a series of terrorist attacks in the country, including one targeting Ataturk Airport in

June 2016 and another one on New Year's Eve 2017 at a popular nightclub in Istanbul. A failed coup attempt in July 2016 also led to internal political tightening. And the Russian-Turkish relationship in 2016 after the Russian fighter jet dispute. in addition to natural disasters such as the 1999 earthquake; all of which affected the Turkish tourism industry.

1.2 Problem Statement

Figure 1: Yearly Tourists Arrival to Turkey from 1996 to 2018



Source: Turkish Statistical Institute(TurkStat)

This paper is constructed to highlight the main factors driving the massive increase in demand on Turkish Tourism covering the period from 1996 to 2018. The qualitative factors will not be disregarded; on the other hand, they will be given a broad overview. To accomplish the goal of the study, the following will be analyzed:

1. What's unique about the qualitative factors that drive demand on Turkish tourism?
2. From studying the literature review, the study identified the following set of quantitative factors that affect tourism demand in Turkey: Effective Exchange Rates for the sampled countries, CPI for the sampled countries and Turkey, GDP

per Capita for the sampled countries, Turkey's Government Spending, Major Political and Natural disaster shocks, and seasonality factor.

1.3 Study Objectives and Importance

The main goal of the research is to evaluate what drives tourism demand in Turkey. Like other nations in the Mediterranean region, the tourism sector is one of the most important businesses in the country. According to statistics, the revenue from the tourism sector was 10% of total revenue in 2014 from a 1% in 1980 *(Huseyni, Doru, & Tunc, 2017)*. Therefore, it is essential to understand what drives such development.

1.4 Study Limitations

This study is conducted on the Turkish economy. Quarterly data is obtained from several sources. Some measures were limited in availability. Collected data was processed and analyzed using Excel and E-Views.

1.5 Study Contents

This study is constructed as follows: Chapter 1 is introducing the main idea from the study. Chapter 2 links the conclusions of this study with the literature review through presenting detailed overview of the Turkish economy and tourism sector. Chapter 3 reviews the literature on other papers that studied tourism in Turkey and other countries. Chapter 4 contains a full description of the methodology used. Chapter 5 contains analysis and results. Chapter 6 concludes and recommend based on the results from chapter 5.

Chapter 2: Overview of the Turkish Economy and Tourism Industry

First of all, the research identifies a list of initiatives taken to establish tourism as a dominant industry in Turkey. This includes building requisite infrastructure, advertisement strategies, language development and other forms of market innovation.

The Turkish Government aims to achieve a huge ambition by 2023; that is to make Turkey a major player in the worldwide Tourism market and attract 50 million tourists annually, which could harvest an annual revenue of 50 billion USD.

The 2023 Turkish Tourism Strategy was first published in 2007, the Strategy is a thorough and comprehensive action plan to make Turkey the uppermost visited target destination of the world by 2023, the strategy targets each vocation of tourism including local tourism, health tourism, universal tourism, historical, cultural and leisure tourism. The Turkish Government is doing its utmost to accomplish their target, the strategy's crucial theme for the 2023 Tourism Strategy for Turkey is diversification and branding, which has proved a huge success, particularly with regards to what the Turkish Airlines is doing and the Go Turkey Tourism organization.

While Turkish government spending increased hugely on major transportation project, according to *Oxford Business Group (2014)*, Turkey has spent more than 25 billion dollars in 2014 alone on transportation, the number is increasing still, year after year on bridges connecting both sides of Istanbul to tunnels and rails connecting the whole country. One of the huge investments that the Turkish government is supporting is air transportation; it is building more airports and expanding existing ones to increase the country's capacity to receive tourists and goods. Aviation is a major mean of transportation and airline deregulation made tourism activities faster, and more convenient. Accessibility of a destination is a main key that affects the volume of travelers and

arrivals to a certain country or a region. Findings ratify that direct flights from and to generating regions have noteworthy influence on the number of travelers.

The disposal and the availability of direct flights from and to a destination consists an essential determinant element which helps stimulate leisure industry and tourism development.

On the supply side, the route network and geographical location of a region within these networks can influence the destinations' accessibility *(Bieger & Wittmer, 2006)*. Flight frequency, service quality, Enhancements and expansion in Airfare, and the availability of low-cost direct flights are considered important factors for the development and the expansion of a destination Turkish airlines has transformed into a prominent air fleet by the number of international destinations served within the past decade.

Therefore, the government is creating an environment supporting one of the biggest fleet of airplanes in the world. According to *Flight Global. (2018)* Turkish Airlines is ranked 10th in the world according to fleet size and 1st by number of countries served with more than 120 destinations, in comparison the 2nd on this list is Air France serving 91 countries only. This shows the huge interest of the Turkish government to position Turkey as a major hub in the world. All of the above factors affect the experience of tourists as well as the wellbeing of Turkish people.

Another major investment by the Turkish government in tourism sector is medical tourism, which has become a flourishing sector in Turkey, in 2017, the country provided wellness programs and healthcare for 765,000 patients from 144 different countries, according to *the Turkish Healthcare Travel Council*.

Offering world-class standards, Turkey increasingly emerged as a destination of choice for an immense range of medical procedures, including: ophthalmic surgeries, bariatric and metabolic surgery, plastic surgery, transplantation and oncologic treatments.

Many people choose to be medically treated in Turkey considering the quality of the healthcare industry, the lower cost, the waiting period and the ultimate efficiency in the healthcare sector; Turkey offers quality medical treatment at lower charges when compared to Europe, the U.S. and other countries. For instance, the cost of angiography is $47,000 in the U.S., $13,000 in Singapore, $11,000 in India and $10,000 in Thailand, while $5,000 in Turkey. Moreover, procedure waiting period was a maximum of two weeks apart from transplantation, in comparison to 18 months in other countries according to *Anadolu Agency*.

It is worth mentioning that Stakeholders in the healthcare industry are seeking further attractions to captivate foreign patients to Turkey in the upcoming years. It goes without saying that the Turkish Airlines offers discounted flight rates to medical travelers. In addition, Turkey combines quality healthcare with exceptional holidays for patients who are in need of recovery and rehabilitation.

Another factor that has huge influence on tourism demand and tourism revenue is media and television, which creates stereotypical images of a tourist destination in the tourist- generating regions. Image is an important part of the marketing scheme of the destinations, Soap Operas and films can be effective to create these powerful images of destinations and influence the tourists and tourism marketers.

This is extensively shown in tourism demand in turkey which has recently witnessed a noteworthy increase in arrivals from Arab & Latin American countries, where in the first eight months of 2018, more than 165,000 Latin American tourist visited Turkey with a 70 percent yearly increase, according to a statement by *the Hotel Association of Turkey (TÜROB)*.

The TV/film-induced tourism's developing popularity; often called film tourism is not a new phenomenon, however it is massively increasing as a result of the growth of international

travel and the evolution of entertainment industry. Turkish films and TV series are attracting excessive attention all over the world, they are promoting Turkey to millions of foreigners and visitors, as people want to spend their holidays in Turkey to explore the life they dream of in Turkish TV series.

Turkey has enjoyed a remarkable increase in the number of tourists from Gulf and Arab countries with every passing day since 2005 after the famous soap-opera Noor (Gumus in Turkish) Since then, national and satellite television channels in the Arab world spent millions of dollars on Turkish TV series according to article published by *the Arab Media & Society Journal (Turkish soap operas in the Arab world: social liberation or cultural alienation?).*

The increased number of tourists and arrivals is significant not only from the Arab countries but also from the Balkans, Europe and Latin American countries, mainly Brazil, Argentina and Colombia, where in the last two years Turkish television dramas gained wide popularity.

Currently, the export of Turkish TV programs is estimated to be worth over $350 million annually, with sales to over 100 countries. Its reach and sales volume make Turkey the second highest selling exporter for television material in the world according to article published by *Daily Sabah Business (Turkish TV series exceed $350 million in exports).*

Additionally, Social media likewise, has made a massive effect on the tourism and entertainment industry. Travelers engage with social networking apps and websites to examine trips, and help make decisions about their holidays and travel destinations, as well as share their experiences of the sites visited i.e. historical sites, a particular hotel, a specific restaurant or an airline. The famous website TripAdvisor in particular has had a vast reaching impact on the

industry. It has over 50 million visitors a month, who are actively looking for travel advice from other tourists and travelers.

Secondly, the research seeks to identify factors affecting the flow of tourists and the challenges affecting Turkey's tourism sectors, and steps taken to address these issues. Here, it is essential to consider the effect of Russia's sanctions against the country on the tourism industry in addition to other factors, such as terrorism and issuing visas and natural disasters. As a result, the study will shed more light on the role of the government in creating thriving tourism sector in the nation. While analyzing economic factors is important to understand the demand on tourism, yet many researchers refer to the natural and other qualitative measures which affect the demand tremendously. For instance, many researchers refer to the availability of cultural and historical sites as a major driver of tourism worldwide, another important factor is natural sights and environmental diversity which satisfies the need of a vast audience.

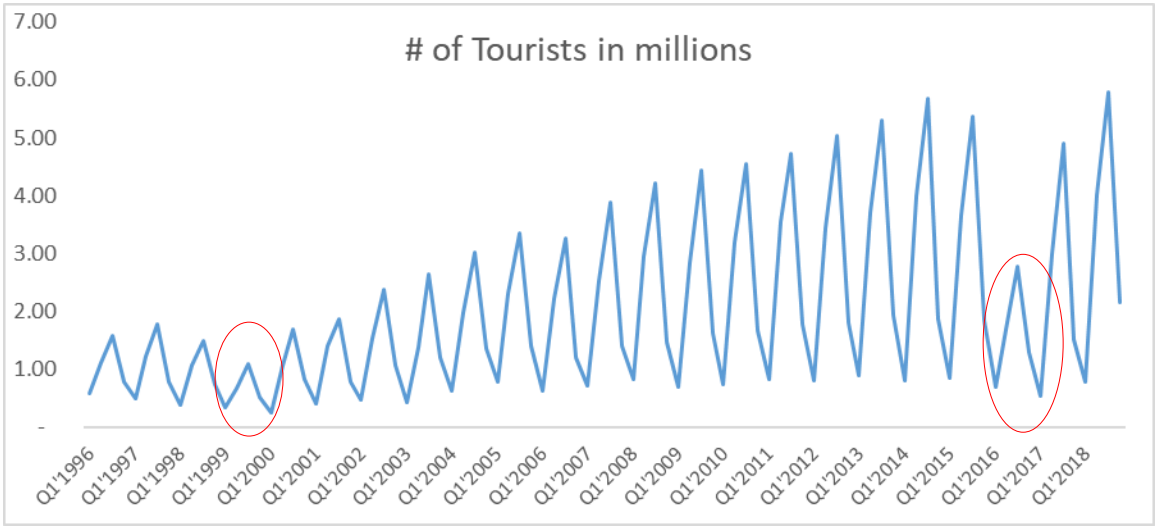
While Turkey is a common destination for its leisure industry cultural and historical tourism, it has an enormous potential with regards to other categories of tourism, including countryside, medical, and religious (faith) tourism. As a result of the country's long history of hosting numerous societies, civilizations and religions; the country is very rich with various religious sites. Pilgrim tourism or Faith (Religious) tourism in Turkey is significantly increasing in popularity. Especially for travelers and tourists who are curious to visit sacred and holy sites, trace back and perceive the myths and legends interrelated to the history of religion.

There are many sacred spots and sites in Turkey such as and not limited to; **Hagia Sophia** in Istanbul which has a legacy for both Muslims and Christians (a church converted into a mosque) -included in UNESCO's List of World Heritage- , **Ephesus, Izmir which is** Located by the Aegean Sea –included in UNESCO's List of World Heritage-, **Church of Santa Claus** in Antalya, **Saint**

Pierre Church in Antakya, **House of Virgin Mary** in İzmir, **Saint Nicola Church** in İznik, , **Sardis Synagogue** in Manisa, **Laodikia ancient city** in Pamukkale, **Derinkuyu Orthodox Church** in Nevşehir.

Weather is also a major factor, Turkey with its long moderate summer attracts many tourists from colder places such Germany, UK and Russia, which are the top three countries visiting Turkey (combined representing more than third of total number of tourists). But this weather also comes with a clear problem for tourism industry in Turkey, seasonality is one of the main challenges affecting the industry. Figure (2) below will help us analyze three major challenges for Turkish tourism, namely; seasonality, politics and natural disasters. *Using quarterly data collected from the Turkish Statistical Institute from 1996 to 2018*

Figure 2: Quarterly Tourists from UK, Russia, Germany



Source: Turkish Statistical Institute(TurkStat)

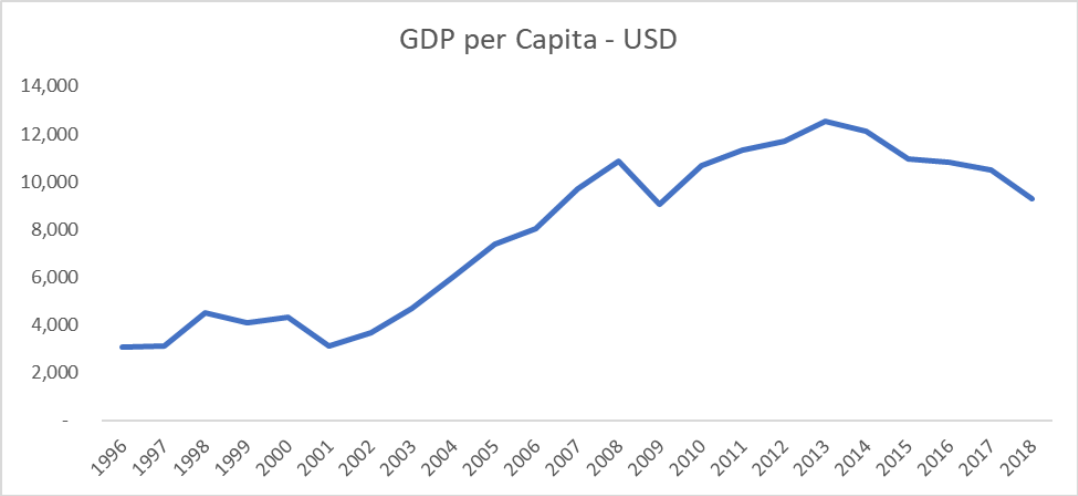
Seasonality: Figure (2) shows that the number of tourists from UK, Germany and Russia traveling to Turkey is clearly increasing, but Turkey is suffering from much lower winter tourism, which affects both the economy and the lives of workers who are dependent on tourism. Many jobs are classified as seasonal and unsustainable for the average worker in tourism. Turkey is trying to normalize this gap with their 2023 vision which tries to add many winter activities for tourists. They intend to invest and advertise for their winter destinations, one of which is creating many skiing resorts in Bursa and other cities.

Politics: looking at the year 2016 on Figure (2) the impact of political turmoil is clear. In 2016 after Turkey shot down a Russian fighter jet, Russia imposed many economic sanctions on Turkey including tariffs and a ban on Russian tourists travel to Turkey. Russian tourists alone make up around 15% of all tourists in Turkey and the country witnessed a drop of around 80% of Russian tourists in 2016. The same year also witnessed a failed military coup attempt which further complicated the scene of tourism in Turkey.

Natural Disasters: referring to the year 1999 on Figure (2), the impact of Izmit earthquake is obvious with a drop of tourists in that year by around 30%, showing the huge impact of natural disasters on the flow tourists.

Diversification: Another important challenge for Turkish tourism is the lack of diversification and the highly concentrated shares for some countries like Russia and Germany and UK were the three countries combined represents more than 30% of all tourists and revenue, this gives these countries a huge influence and pressure tool. Tourism represents more than 12% of Turkish GDP and thus these countries represents 4% of Turkish GDP through tourism only.

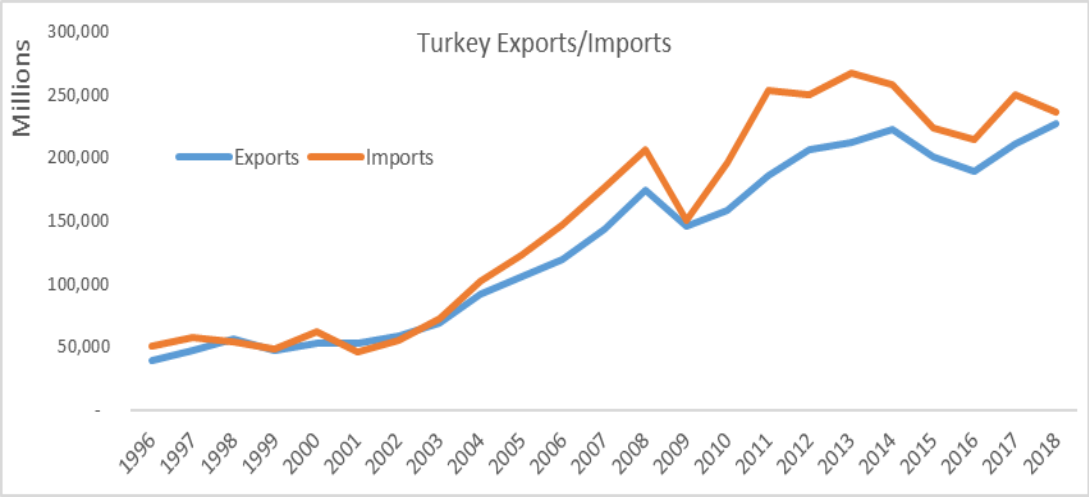
Figure 3: Turkey GDP per Capita from 1996 to 2018



Source: World Bank data

Figure (3) shows the significant increase in Turkey's GDP in the past two decades. According to World Bank data; Turkey GDP increased from $169 billion in 1996 to more than $766 billion in 2018.

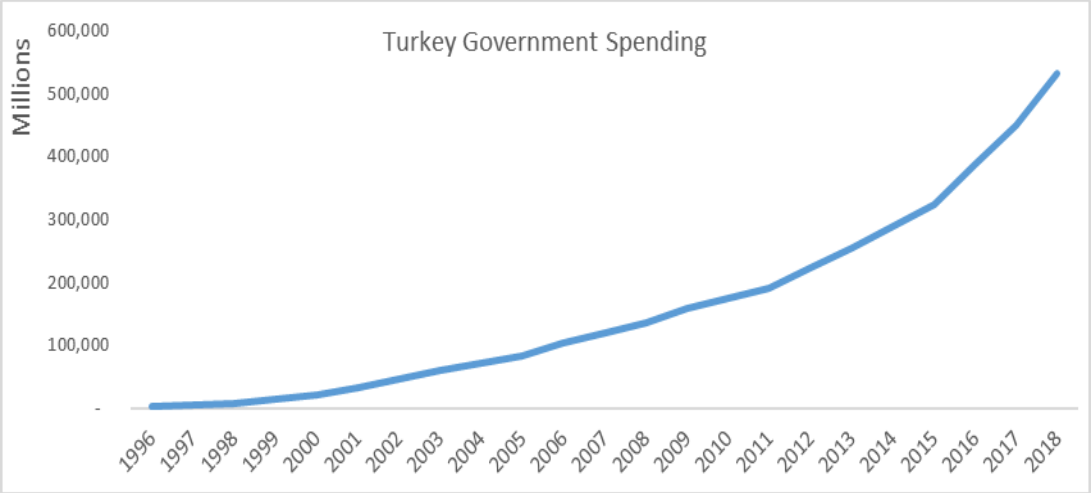
Figure 4: Turkey flow of Goods, Exports and Imports



Source: World Bank data

Figure (4) shows that the flow of goods and service to and from turkey increased by more than 5 folds since 1996 to 2018.

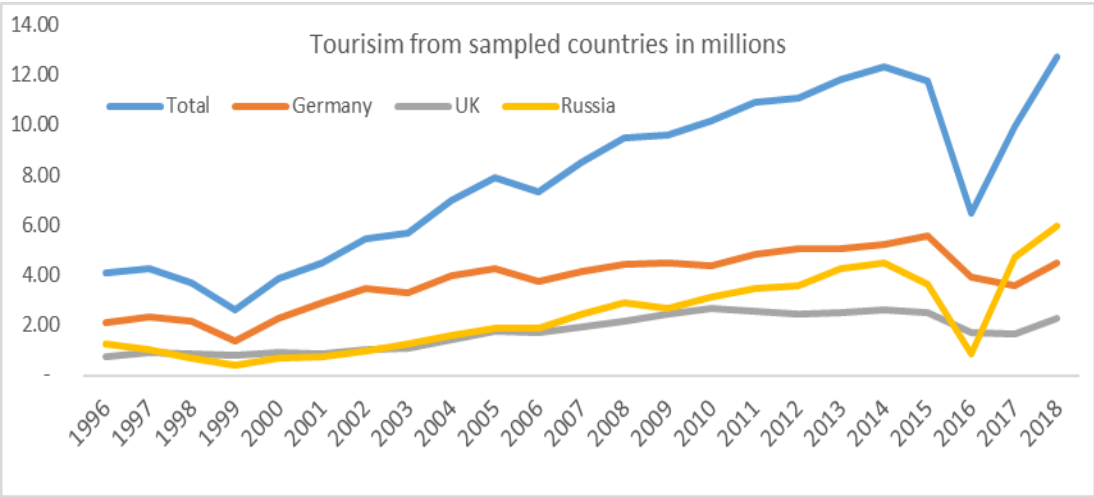
Figure 5: Turkey Government Spending from 1996 to 2018



Source: World Bank data

Figure (5) explains part of the huge increase in GDP and the flow of goods and services to and from Turkey. When looking at Turkey government spending we can realize that the huge increase showed in Figure (3) and (4) was accompanied by greater government spending on education, infrastructure and other; which in turn enhances tourism experience and attract local investments in the industry.

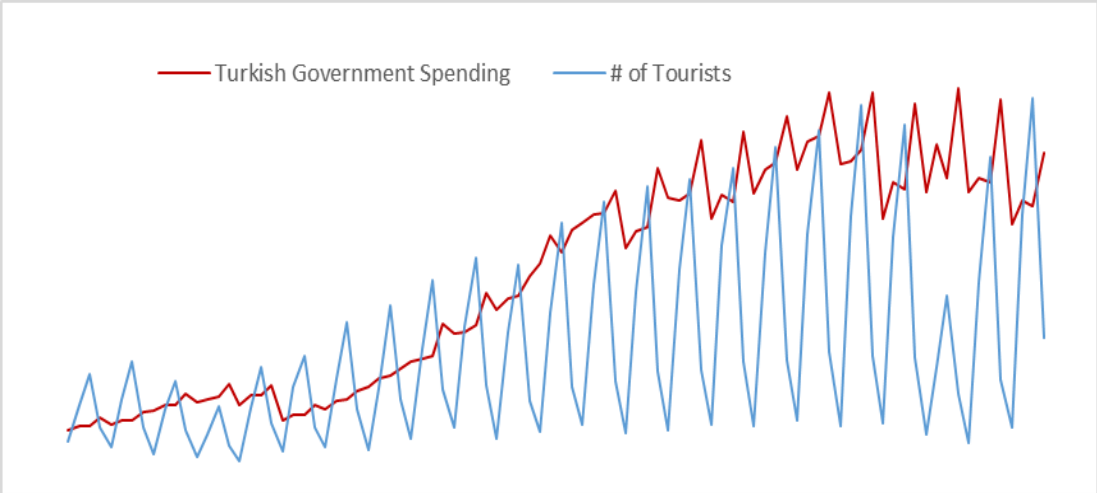
Figure 6: International tourist arrivals in Turkey from 1996 to 2018



Source: Turkish Statistical Institute(TurkStat)

Figures (6) links Figure (3), (4) and (5) by showing that greater government spending on infrastructure has benefited the economy directly by increasing imports/exports flow to/from the country affecting the GDP and indirectly by attracting more tourists. It also shows the persistent increase in number of tourists from UK, Germany and Russia to Turkey from 1996 to 2018. And it clearly shows the huge impact of Russian-Turkish political relationship in 2016 after Turkey shot down a Russian fighter jet, in addition to Izmit earthquake in 1999.

Figure 7: Quarterly Cross-Sectional Data of Tourists and Turkish Government Spending



Source: Turkish Statistical Institute(TurkStat)

The above conclusions can be further confirmed using Figure (7) below which shows the spending behavior of the Turkish government, where most of their spending peaks usually 3 quarters before tourist's peak.

Lastly, the research seeks to identify quantitative factors affecting the flow of tourists in Turkey. By analyzing the literature review in a comprehensive manner, it will be possible to identify the independent and dependent variables in the study.

Chapter 3: Literature Review

Tourism is termed as an essential feature of economic growth; countries such as the United Kingdom, Greece, Turkey, and the Island of Guam have direct and indirect incomes and developments from the tourism industry. around 4% of their total GDP's is sourced from the tourism industry. Additionally, these incomes that are acquired from the tourism sector tend to pave the way for numerous opportunities within the domestic economy through tourism jobs. Knowledge and cultural interaction and exchange are also considered as an additional benefit of tourism (Agiomirgianakis, Serenis & Tsounis, 2015). Both direct and indirect income and other positive impacts of tourism are termed as an essential tool for economic growth in any country. The direction of causality between tourism and economic growth is a crucial subject to this paper. For countries such as Turkey and the United Kingdom, international tourism aids in fixing the payment balances and hence providing an essential financial tool for a technological device that is commonly used in the manufacturing countries.

Tourism, however, is not automatically guaranteed by the excellent climatic conditions and other natural features, rather a tourism destination must ensure that the least level of tourism provision has been installed into place. Some of this tourism provision include reasonable prices of tourist products and adequate infrastructure. Therefore, due to a unique combination of the above factors, countries such as Turkey, Greece, United Kingdom have become popular tourist attraction destinations in the world. The paper evaluates by using data analysis to assess the economic impact accrued from the flow of tourists into a tourism destination.

Aslan, Kaplan, & Kula (2008) use the dynamic approach to model the tourism industry in Turkey. According to the authors, despite the high interest among researchers to understand the factors driving the high demand for tourism in Turkey, many researchers have continuously

ignored important variables like the infrastructure and accommodation facilities in the nation. Since tourism is one of the largest revenue generators in the country, it is essential to use an appropriate model to estimate the short-term, and long-term tourism demand factors in the nation. The model has one dependent variable, which is tourism spending ratio in the host country. There are seven independent variables including real capital per income of sending country, relative price between host and sending country, accommodation capacity in the host country, public investment ratio in the host country, stochastic error, and two dummy variables to capture the effects of external shocks particularly the Marmara Earthquake and September 11th events. The model uses panel data to investigate the relationship between the dependent and independent variables. Results indicate that the total flow of tourists into Turkey significantly differs from one year to another. It also emerges that external shocks like the Marmara earthquake have a negative effect on the country's tourism sector. Lastly, the economic welfare of the tourists has little effect on their decision to visit Turkey; thus the nation's tourism industry is not a luxury commodity.

The root test approach of examining the effects of tourism exchange rates volatility in Turkey can be modified by the inclusion of various measures and also the consideration of different seasonal effects. The flow of tourists within a country is considered as a function of the relative prices within a country, the volatility of the exchange rate and the GDP. The formula below illustrates the trend that is used to evaluate the tourism volatility on economies.

Expressing all the samples and data collected in the logarithm form, it is then possible to acquire the monetary impact accrued from tourism. Logarithms are used to capture the multiplicative time series impacts and is usually denoted by L that precedes every name of the variable (Aslan, Kaplan & Kula, 2008).

Some of the variables that are used in the data analysis include the Real Gross Domestic Products (GDP) per capita, the real private consumption expenditure per capita, and the actual private consumption expenditures per capita from a specific year for various countries. The tourism prices are inclusive of the costs of both goods and services that are purchased with the state of tourism destinations (Agiomirgianakis, Serenis & Tsounis, 2015). The relative prices that are used in evaluating the economic impact of tourism within a country are represented by specific indices denoted with (CPI). On the other hand, the LTP is used to denote the logarithm relative prices to indicate the differences between the logarithm of estimates of the destination countries and the origin countries.

The industrial average impact, therefore, within the tourist destinations, can be evaluated by using the above model (Aslan, Kaplan & Kula, 2008). The real exchange rates are used to measure the effective prices of the goods and services within the destination countries. For instance, when the consumer prices change, there is an economic impact on the destination country in terms of their revenues acquired and the GDP (Aslan, Kaplan & Kula, 2008).

The direct proportionality between industrial expansion and a country's GDP explains the relative GDP improvement in the country following the rapid growth of the tourism sector. Kucukaltan & Terzioglu (2013) point out the increased demand for tourism in the country as one of the factors contributing to the expansion of the service industry. Kucukaltan & Terzioglu base their arguments based on the economic interactions between tourism demand, the foreign exchange rates, and the GDP of Turkey in a period between the first quarters of 1987 and 2012. The article proves the rationale for the direct comparison of the tourism situation in Turkey to that of the developed countries in the short run. While the volatility of the exchange rates is a threat to the demand for tourism in Turkey, Kucukaltan & Terzioglu add that incentives and a number of travel

agencies in the nation can also play a crucial role in controlling the demand. This approach employs panel data estimations. The approach employs this method due to the presence of the static regression models can lead to the development of several issues, including natural disasters, spurious regression and structural instabilities. Researchers have, however, ignored the significant variables that have supported the tourism sector, including accommodation and infrastructure (Kucukaltan & Terzioglu, 2013). Another approach that is used to evaluate the tourism demand in Turkey is the panel data model that is used to evaluate the significant demanding function of tourism in the country concerning the chief clients such as Ukraine, Bulgaria, Iran, Austria, France, Holland, United Kingdom, Russia and Germany for a minimum period of 10 years.

The gravity model approach is another significant approach that is used to evaluate the determinants of interactions. The model tends to expound on the flow of goods, capital and the people into the country. The model is divided into two approaches, where one of the approaches is used to forecast on the variables that lead to the constant flow of individuals into the country. The second type of model tends to evaluate international tourism flows and their impact. Natural disasters are inevitable in any country (Kucukaltan & Terzioglu, 2013). Turkey and Nepal have profoundly been affected by natural disasters such as earthquakes and floods. The above-discussed models have aided these countries in bringing the destinations back on track as well as all the stakeholders with tourism.

Another important model used to measure Turkey's tourism industry is the panel gravity model. However, the inability of many models to measure the macro and micro-economic factors influencing Turkey's domestic and international tourism sector reduces the ability of the country to compete effectively in the global tourism sector (Saray & Karagoz, 2010). The paper uses two models to investigate the factors influencing Turkey's tourism industry. The dependent variable is

the number of tourists from the selected country, while the independent variables vary between the two models. In the first model, the independent variables include the country's GDP, the mid-year population of the source nation, and a weighted measure of distance between the host and source country. The only difference is that the GDP per capita replaces the GDP as the independent variables. Results indicate that with the GDP per capita as an independent variable, all the other variables are significant while using GDP population has a negative coefficient to the tourism numbers.

The exchange rate volatility model is used with a modification to include various volatility measures. The approach puts into consideration the season ability effects. The number of tourists visiting the country refers to both residents and the non-residents who visit the country for tourism (Işık & Bostancıeri, 2017). The model, therefore, evaluates the relative prices of the country's CPI that could be deflated by an index measure.

The importance of tourism to a country's economy cannot be underscored. From a commercial point of view, tourism- just like any other business- is affected by the forces of demand and supply. It is this notion that forms the augmentative baseline for the propositions of Dritsakis (2004) on the various changes in tourism demand in the long run. With the point of reference being Greece and Germany, Dritsakis introduces various macroeconomic variables that affect the demand capacity of tourism in these two European tourism powerhouses. Based on the article, it is clear that the aggregate income of the given country is crucial to the determination of the cost incurred by tourists upon visiting such destinations. Additionally, Dritsakis factors other macroeconomic variables like the fluctuating foreign exchange rates and the costs of transports as factors that affect the price levels in the tourism sector. By extension, the variables also influence

the pricing in the tourism industry in Turkey based on the structural and operational homogeneity with that in Germany and Greece.

Researchers have evaluated that an exchange rate volatility measurement is not just an observable variable. Instead, the specialists to this model have not yet established the exact measure of volatility. The application of such a model is quite advantageous. However, it has its disadvantages in the aspect that it is not able to incorporate and capture the possible effects of the low and the measure of the high peak of tourism exchange rates (Claret, 2014). The high and the low peaks, according to the researchers, tend to capture the unpredictable factors which affect the operations of the tour. Some researchers have highly commended on the significance of the uncertain exchange rates for exports while others have put into place the volatility measures in order to comprehend the volatile exchange rates in the economy as an influence of tourism.

According to researchers, the arrival of a Japanese tourist on the Island of Guam has had a significant impact on the economy of the country.

Over the years, the infrastructure levels in the Island of Guam have greatly improved. The roads, airlines, and other travelling conditions have been enhanced, thus creating an easy path to the tourist. The countries that never used to visit the states now have easy access to tourist destinations due to the improved infrastructure conditions (Isik & Bostancieri, 2017) The tourism and the travel sectors in conjunction not only have an impact on the county's GDP but also creates wealth for the private individuals, the companies, voluntary bodies, and the companies (Kucukaltan & Terzioglu, 2013). The revenue that is accrued from the tourism development activities is often essential to the well-being of the economy, and it is often boosted by significant concepts referred to as the multiplier impacts. Tourism has the capability of creating jobs in both private and public sectors and, thus, an improvement in the economic standards of living in the

destination countries (Kunwar & Chand, 2016). Employments are often created in sectors such as hotels, tour guides, travel agencies, and other tour operations. Indirectly, the tourism sector creates employment in industries that are indirectly associated with the industry, such as banking agencies, transport, and design companies.

However, much tourism has had positive impacts on the economies of countries like Guam; the sector can cause a fluctuation in the economic developments of the tourist. It could lead to the loss of traditional employment and seasonal employment. Additionally, the cost of living within the tourist destination countries has the likelihood of increasing (Yurtseven, 2015). A leakage is likely to occur in case the money is lost in the destination area. The development of the tourism sector can lead to a decline in the economy due to the loss of traditional jobs such as farming and fishing. However, it is essential to note that the economic development of a country is determined by the GDP and the revenues accrued from the tourism sector and the percentile of impact (Kucukaltan & Terzioglu, 2013).

The leads for the economic growth in various countries is due to the tourism structure of multiple tourism destinations. Taking, for instance, Turkey, Greece, and the island of Guam, tourists tend to be contained in all-inclusive star hotels with at least 60% accommodation. On the other hand, the five, four, and three-star hotels account for 40%, 30%, and 20%, respectively. These hotels have highly been invested in (Claret, 2014). They are some of the necessities of tourist attraction sites, and therefore they tend to capture many revenues for the country. They have contributed significantly to an increase of the GDP within the destination countries. It is quite notable that countries mentioned above have created a great attraction to tourists from both developing Eastern European and Middle East countries and the developed western countries. This is an indicator that the states have quality features of high development and industrial standards.

Tourist has the likelihood of expecting modified shopping, travelling, and accommodation conditions, and these countries provide to them. Additionally, the tourism sector has had a significant impact on the economy of tourist destinations (Dritsakis, 2004). Some of these economic impacts include; improved infrastructure, increased employment rates, and an economic multiplier impact.

Tourism can be termed both as an element and a product of a complex interrelated and independent systems that are comprised of societies and destinations. However, in reality, tourism can be termed as a composite industry that is characterized by other smaller industries. Nonetheless, no one has a complete idea of its impact on the economy. Tourism consists of unpredictability and uncertainty that have always been a way into consideration. Tourism has been studied and practiced throughout the world, including the United States, Turkey, Greece, Germany, Great Britain, Sweden, and the Island of Guam among others. Over the years, tourism has been a significant practice in these countries. Additionally, their economies have been highly dependent on these tourism activities. For instance, Turkey is one of the largest tourist destinations in the world. Tourism attracts higher income levels for most of the countries, and this has been on the more upper side of earnings within a country.

The causality takes between tourism and income has been evaluated for countries such as Turkey, Greece, and the United Kingdom with the aid of variables such as the real exchange rate and the actual export volume by using the multi-variate vector autoregressive approach. Several outcomes have been identified, including the developments acquired from tourism. With the use of counteraction evaluation and the auto-correction model, it is being possible to explain the demand for tourism in these countries. Tourism termed as a critical revenue source for many countries all over the world, and therefore it is associated with several economic outcomes. The

literature review will look into the numerous economic developments that are associated with tourism in various countries.

The tourism industry is one of the most thriving sectors in the world, with global tourism showing a steady increase within recent years. In this case, therefore, tourism is becoming a useful tool for economic growth and an expansion in development. For the majority of the countries, tourism comprises of prominent sources of revenues, incomes, foreign exchanges, tax, and employment. Turkey and Greece are some of the leading tourism destinations in the world. In contemporary days, tourism has become one of the leading gaining sectors within these countries' economies. Regarding developing the areas, it is essential to determine the factors that have contributed to the increase in the tourist flow within these countries.

Basing on a distinction to determine and represent the size of the economy, the two alternative data models can be used. The results can be termed as highly sensitive to the specifications of the model concerning the coefficients of tourism data and the significance. In case the GDP of a country is adopted as a proxy for the country's size of the economy, each of the variables is regarded as highly relevant. GDP is very significant in evaluating the impact of tourism on the economy. On the other hand, the GDP per capita has a high effect on tourist arrivals and their coefficients as well. Therefore, countries such as Turkey, whose tourism sectors are highly growing, their GDP per capita co-efficient are quite high.

Upon reviewing the literature review on tourism demand, a unique model was selected using variables that were individually used in previous papers but the five selected variables for this study was not used simultaneously in any study that the researcher reviewed, namely: GDP per Capita for Russia, Germany, UK and Turkish government spending and tourism price in Turkey and Shocks dummy variable and Seasonality dummy variable, Thus, this study is unique in using two dummy variables alongside all macro-economic variables which was not used in any previous study that the researcher reviewed for the purpose of this study. Many variables can be added as per the literature review like the population of the sending countries, distance between countries, airfares, bed capacity and others, but they were dropped from the model due to lack of data.

The following section discusses in details the model selection and variables interpretations.

Chapter 4: Methodology

After several iterations and trials, the following model is the final model that was used in this study:

Eq 1:

$$\ln TD_{Tur} = \alpha_1 \ln GDPpC_s + \alpha_2 \ln TP_{Tur} + \alpha_3 \ln G_{Tur}$$
$$+\alpha_4 Seasonal\ Dummy + \alpha_5 Shocks\ Dummy + \varepsilon$$

Where:

- TD: Tourism Demand in Turkey from the sampled courtiers (Russia, Germany and UK)

- GDPpC: GDP per Capita for the sampled countries, similar to Aslan, Kaplan, & Kula, (2008) & Saray & Karagoz (2010) & Abedtalas & Toprak (2015) & Dritsakis (2004), which reflects the relative purchasing power and standard of living of the sampled countries and thus enable us to measure whether tourism to Turkey is considered a luxury good or not.

- TP: Tourism Price for the sampled countries in Turkey similar to Kuçukaltan & Terzioglu (2013), which reflects the relative prices between the countries and thus enable us to measure the relative cost of travel and accommodation from the sampled countries to Turkey.

Where $TP = \frac{CPI_S}{CPI_{Tur}} * \ e_{Tur} * W$

- CPI_S: Consumer Price Index for the sampled countries
- CPI_{Tur}: Consumer Price Index for Turkey
- e_{Tur}: Effective Exchange Rate for Turkey
- W: The ratio of the number of tourists from each one of the sampled countries to the total demand from the sampled countries.

- G: Government spending in Turkey, this variable was not used in any of the previous studies reviewed by the researcher in this paper, which reflects the government efforts in enhancing the infrastructure and transportation systems to support bigger influx of tourist to Turkey as well as spending on entertainment attractions.

- Seasonal Dummy: similar to Dritsakis (2004) which is a binary dummy where (0) represents autumn and winter (Q4 and Q1), (1) represents spring and summer (Q2 and Q3).

- Shocks Dummy: similar to Abedtalas & Toprak (2015) & Aslan, Kaplan & Kula (2008) which is a binary dummy where (0) represents no shocks and (1) represents either a political shock (military coup, political tension with Russia in 2016) or a natural disaster (Izmit earthquake in 1999)

The quantitative data is collected for the years 1996-2018 on a quarterly basis. The study adopted economic model to investigate the relationship between the independent and dependent variable. Time series regression analysis; it is suitable for modeling changes in economic variables. However, it is imperative to ensure that the consistency of the data collection period. The model shows the correlation coefficient variables between the two types of variables, hence the effective interpretation of the relationship between the elements.

The ARDL bounds testing procedure introduced by Pesaran et al. (2001) to test for the long-run equilibrium between the variables namely; GDP per capita, Tourism Price and Turkish Government Spending, the ARDL became one of the most favored technique among researchers for its advantages compared with other single co-integration methods such as Engle-Granger method. The main advantages of using ARDL approach are as follows: first, both short run and long run coefficients are evaluated simultaneously. Second, even with some regrossers being endogenous to the model, ARDL will yield an unbiased estimate for the long-run relationship and a valid t-statistics. Third, ARDL approach is more useful with small samples size. Fourth, ARDL can be applied regardless of whether the parameters are I(0) or I(1) or a combination of them. Fifth, the error correction model (ECM) can be estimated easily using a linear approach.

In a nutshell, the ARDL approach is a much better approach to use. It includes two main steps, the first step is assessing whether variables are co-integrated and long-run relationship do exist, and the second step is estimating the short and long run models.

Economic and financial data usually exhibit trending behavior, thus, one of our main objectives is to find trending behaviors and try to remove it. The unit root test is applied to test for stationarity, and the test will tell the researcher if the data have unit root (non-stationary) or not.

Testing for unit root is done using the work of (Dickey and Fuller 1979) and the objective is to test for hypothesis that $\varphi=1$ in the following regression:

$$Yt = \varphi Yt\text{-}1 + ut$$

Where

H0: data have unit root (non-stationary)

H1: data is stationary

The null states that the variables are non-stationary and the alternative states that the variables are stationary. There are several variation of the Dicky Fuller test as shown below:

1. Without trend and intercept

   $\Delta Yt=\varphi Yt\text{-}1+ut$

2. With intercept only

   $\Delta Yt=\beta 0+\varphi Yt\text{-}1+ut$

3. With both intercept and trend

   $\Delta Yt=\beta 0+\beta 1t+ \varphi Yt\text{-}1+ut$

When the unit root test is stationary at level we denote it as I (0), but when variables are non-stationary at level then we have to apply first difference and test again, if the test result in stationary variable at first difference we donate as I (1). According to Ouattara (2004), the computed F-statistics suggested by Pesaran et al. (2001) will be worthless with the presence of I (2) (series integrated at order 2) variables.

Introduced by Pesaran et al. (2001), the ARDL Co-Integration method offers several advantages in comparison with other co-integration methods such as Johansen and Juselius (1990), Engle and Granger (1987), and Johansen (1988) procedures. The ARDL bounds testing approach is composed of two main steps as follows:

1. Looking for the existence of long-run relationship between all factors in the model.

Where:

H0: Co-integration does not exist

H1: Co-integration exists

The testing procedure is based on the joint F-statistic, if the value of F-statistic is higher than the upper level of the band, then we reject the null hypothesis, that is there is co-integration and thus long-run relationship can be established. Narayan (2005) argued that the current values of critical points are valid for large data sets and are not proper to use on small data sets.

2. If the variables are indeed related in the long run as per the first step, then an error correction model (ECM) must be estimated and error correction term (ECT) will be measured and added to the short run model.

The stability of the long-run and short-run coefficients is tested using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) tests which were originally proposed by Brown et al. (1975). When the plots of CUSUM and CUSUMSQ statistics are within the critical bound of 5% level of significance, then we conclude that all coefficients are stable and null hypothesis cannot be rejected.

Chapter 5: Analysis and Findings

6.1 Unit Root Test Results

As discussed earlier, the ARDL testing approach can be used whether the variables are I (0) or I (1) according to Pesaran (1997). However, the computed F-statistics provided by Pesaran et al. (2001) becomes invalid in the existence of I (2) variables. Thus, the execution of unit root tests in the ARDL technique is important to guarantee that none of the variables is integrated at an order of I (2) or beyond. So Augmented Dicky Fuller (ADF) test is used for testing for unit root. The null hypothesis states that there is a unit root. While, the alternative hypothesis states that there is no unit root (the data is stationarity). The Dickey Fuller regressions include an intercept in the levels, and include an intercept in the first differences. Each variable was tested for a unit root at the 5% level of significance.

Table (1) and Figure (8) below show that the null hypothesis cannot be rejected, which implies that the variables are nonstationary at level. This is can be shown by comparing the absolute value of the t-statistics to the critical value at 5% level of significance. When the absolute value of t-statistics is lower than the critical value at 5% level of significance the null hypothesis cannot be rejected and the variables are nonstationary.

Table 1: ADF Test for Levels

Variables	**t-statistics**	**Critical value at 5%**
LnTD	-1.34	-2.90
LnGDPpC	-1.03	-2.90
LnTP	-1.62	-2.90
LnG	-1.42	-2.90

Figure 8: Visual representation of ADF Test at Levels

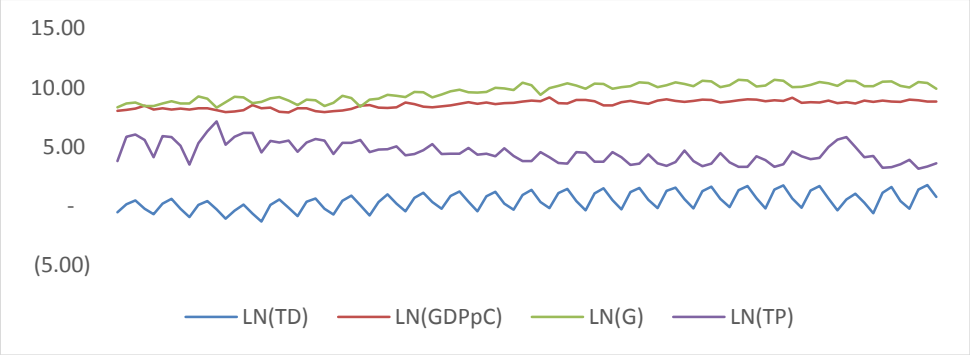
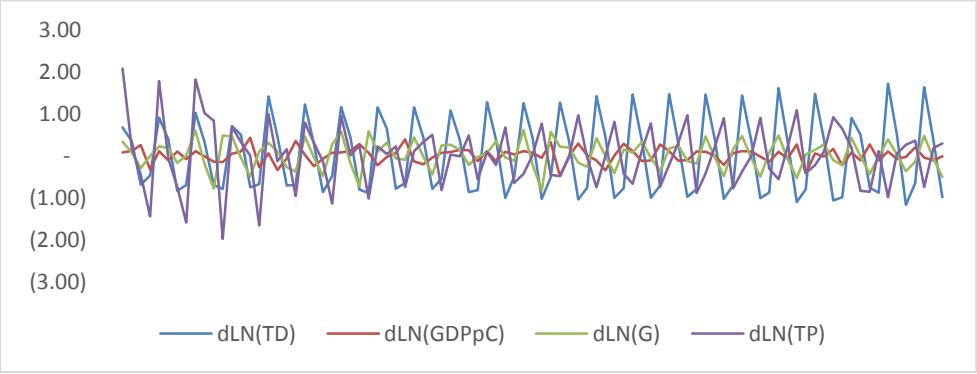


Table (2) and Figure (9) below confirms that the null hypothesis is rejected, meaning that the variables are stationary at first difference.

Table 2: ADF Test for the 1st Difference

Variables	t-statistics	Critical value at 5%
LnTD	-3.08	-2.90
LnGDPpC	-7.76	-2.90
LnTP	-3.63	-2.90
LnG	-15.09	-2.90

Figure 9: Visual representation of ADF Test for the 1st Difference



6.2 Co-integration Test Results

As discussed earlier, the ARDL bounds testing approach tries to examine whether the variables are co-integrated which means that long-run relationship exists or not.

The testing procedure is based on the joint F-statistic, if the value of F-statistic is higher than the upper level of the band, then we reject the null hypothesis that is there is no co-integration and we conclude that there is co-integration and thus long-run model must be estimated using the ECM.

Table (3) below presents the calculated F-statistics. The following four factors affect the distribution of the F-test which has a distribution that is nonstandard: the order of variables included in the ARDL model, the number of explanatory variables, whether the ARDL model includes an intercept and time trend, and the sample size.

Table 3: F-test for Co-integration

Model	**F-statistics**	**Upper Critical Value at 5%**	**Conclusion**
F(LnTD / LnGDPpC LnTP LnG Seasonal Dummy Shocks Dummy)	12.28	2.76	Co-integration

The computed F-statistic which is greater than the upper bound of the critical value of 2.76 at the 5% significance level. So, at the 5% level, it is concluded that the null hypothesis is rejected, and as such there is a co-integration among variables.

If series are co-integrated it implies that there exists a long run relationship, such series can be combined in a linear fashion because if there are shocks in the short run which may affect movements, but in the long run there will be convergence.

6.3 Long-Run Elasticity

Given the results of the co-integration test and the presence of long run relationship, the ARDL procedure is used to evaluate equation 1 with a maximum lag of 8 quarters. The smallest lag length was selected using the AIC criterion in order to minimize the loss of degrees of freedom.

Long-Run Model specification:

$Eq\ 2$:

$$\ln TD_{Tur} = \alpha_1 \ln GDPpC_s(-6) + \alpha_2 \ln TP_{Tur}(-6) + \alpha_3 \ln G_{Tur}(-4)$$

$$+\alpha_4\, Seasonal\ Dummy + \alpha_5\, Shocks\ Dummy + \ \varepsilon$$

The optimal lag was selected when running the lag structure test in Eviews, *refer to table (7) in the appendix*. The optimal lag for **G** is **4** quarters which means it takes around one year for G to affect tourism in Turkey, which makes sense when looking at huge governmental projects that require a lot of time to plan and execute. The optimal lag in both **GDPpC** and **TP** is **6** quarters, which also makes sense where any measurable impact needs time for consumers to reflect on their behavior and spending habits. Table (4) below presents the long run estimates of coefficients.

Table 4: Long-Run Estimation Results

Variables	**Coefficients**	**Std. Error**	**t-Statistic**	**Prob.**
LnGDPpC	-0.37	0.09	-4.28	0.01
LnTP	0.18	0.02	7.18	0.03
LnG	0.18	0.08	2.11	0.04
Seasonal	1.21	0.08	15.08	0.00
Shocks	-0.59	0.18	-3.29	0.02

As shown in Table (4), all variables are significant at the 5% level of significance.

Coefficients interpretation:

- As government spending increases on infrastructure and transportation as well as education and other services, tourism demand increases as a result of better tourism environment and easier and cheaper access to travel and accommodation.
- In the long run and as GDPpC for the sampled countries increases, tourism demand to Turkey decreases. This can be explained by higher purchasing power, which decreases demand on cheaper destinations and increases demand on more expensive destinations. Therefore, tourism to Turkey is not a luxury good in the long run, similar to Aslan, Kaplan & Kula (2008)).
- When TP increases; tourism demand in Turkey increases. Which reflects the expected results from normal demand function where lower relative prices increase quantity demanded similar to Kuçukaltan & Terzioglu. (2013).
- Seasonal dummy: as expected, demand increases significantly during spring and summer (Q2 & Q3) compared to autumn and winter (Q1 & Q4)
- Shocks dummy: as expected, demand decreases during political tensions and natural disasters such as Russian-Turkish political tension in 2016 and Izmit earthquake in 1999.

6.4 Short-Run Elasticity

Given the results of the long run model, ECM must be evaluated in order to estimate the long run adjustments. ECM was estimated using the residual from the long-run model as a plug-in series in the short-run model.

Short-Run Model specification:

Eq 3:

$$\Delta ln\, TD_{Tur} = \alpha_1\, \Delta ln\, GDPpC_s(-6) + \alpha_2 \Delta\, ln\, TP_{Tur}(-6) + \alpha_3\, \Delta ln\, G_{Tur}(-4) + \alpha_4\, Seasonal\ Dummy + \alpha_5\, Shocks\ Dummy + ECT(-1)$$

Table (5) below presents the short run estimates of coefficients.

Table 5: Short-Run Estimation Results

Variables	Coefficients	Std. Error	t-Statistic	Prob.
LnGDPpC	-0.35	0.17	-2.07	0.04
LnTP	-0.04	0.10	-0.39	0.70
LnG	-0.14	0.09	-1.58	0.12
Seasonal	0.42	0.10	4.23	0.00
Shocks	-0.31	0.26	-1.20	0.23
ECT	-1.81	0.20	-8.88	0.00

As shown in Table (5), TP & G & Shocks Dummy are insignificant in the short-rut while GDPpC & Seasonal variables are significant at the 5% level of significance.

The coefficient of estimated ECT is also negative and statistically significant at 5% confidence level. These values mean that any shocks that deviate values from the long-run equilibrium between variables is revised for every period to get back to equilibrium level in the long-run.

Coefficients interpretation:

- In the short-run; the most determining factor of tourist arrival to Turkey is season (spring and summer) which makes sense since the sampled countries (Russia, Germany and UK) have long cold winters and moderate short summers so as tourists they seek the sun (average yearly temperature in UK is 11c, and in Germany 10c, and in Russia 7c while in Turkey its 20c)
- In the short run and as GDPpC for the sampled countries increases, tourism demand to decreases reflecting the fact that people will be able to visit more expensive destination with growing economies and increased purchasing power.
- TP, G and Shocks are insignificant factors in the short-run.
- ECT coefficient is negative and significant at 5% level and it can be interpreted as the speed of adjustment from the short-run shocks at around 180%, or stated another way it takes around 1/180% quarters to adjust from short-run shocks. The coefficient is lower than -1 due to seasonality presence in the quarterly data.

Model Stability

Most studies of macroeconomic variables may be subject to structural breaks. Accordingly, the stability of the short and long run coefficients are diagnosed through the CUSUM and CUSUMSQ tests which were originally proposed by Brown et al. (1975). The charts below show the CUSUM and CUSUMSQ tests.

Figure 10: CUSUM. Cumulative Sum Plot

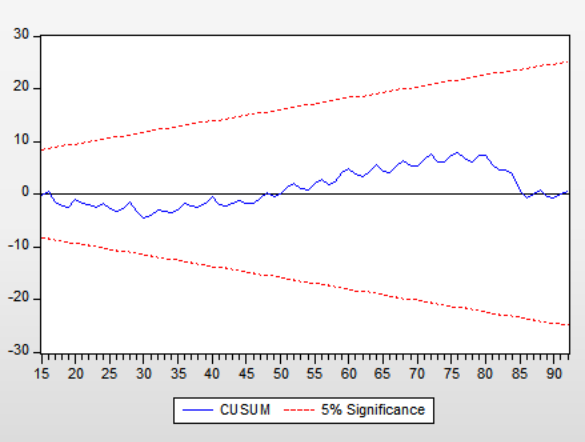


Figure 11: CUSMSQ, Cumulative Sum of Squares Plot

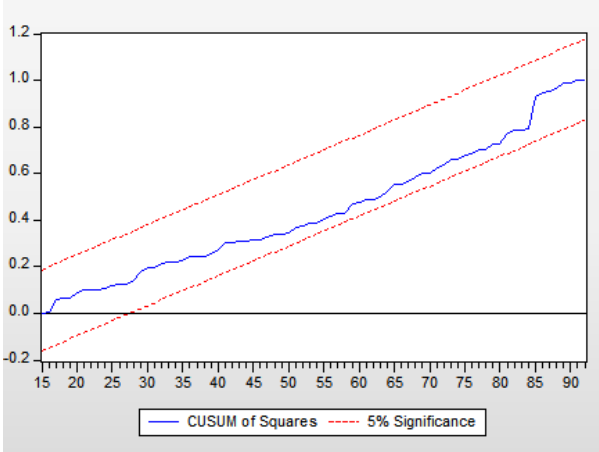


Figure (10) and (11) present the plots of CUSUM and CUSUMSQ tests statistics which are positioned inside the critical bounds of 5% significance level. This suggests that during the selected period, parameters are stable and immune for sudden changes that affect the quality of the parameters.

Chapter 6: Conclusions and Recommendations

This study examines the short and long run relationship between tourism demand in Turkey from the top three countries visiting Turkey (Russia, Germany and UK) with the Turkish government spending and tourism price in Turkey and GDP per Capita for the top three countries and seasonal dummy variable and shocks dummy variable using quarterly time-series data from 1996 to 2018 collected from several sources.

The joint F-test for co-integration confirmed the long run relationship between the variables and both the long run and short run models were estimated.

In the long run; as government spending increases, tourism demand increases as a result of better tourism environment and easier and cheaper access to travel and accommodation. And as GDP per Capita for the sampled countries increases, tourism demand to turkey decreases, this can be explained by higher purchasing power, which decreases demand on cheaper destinations and increases demand on more expensive destinations. When Tourism Price increases; tourism demand in Turkey increases, reflecting cheaper accommodation and travel cost. But looking at the extensive investments in tourism industry in Turkey and the huge advertising campaigns by both the government and the private sector we can conclude that this strategy attracted more and more tourists despite the relative increase in cost of tourism in Turkey. Another possible explanation is that the increase in Tourism Price in Turkey is small when compared with Turkey's Tourism competitors such as Greece, Malta, Cyprus and Italy.

Based on the above conclusions and interpretations, the study recommends that countries with potential rich tourism industry should start planning to attract more tourists. Governments should invest in tourism which in return will benefit the whole economy both in the short and long run. Governments should boost cooperation between public and private sectors to invest in the needed infrastructure to attract more tourists. Government should also plan to diversify its tourism industry and invest more in alternative tourism such as medical and religious tourism. Governments should also maintain a stable political climate to attract tourists. Economic and political stability are key factors along other natural and cultural factors.

References

Abedtalas, M., & Toprak, L. (2015). *The determinants of tourism demand in Turkey*. Journal of Economics and Behavioral Studies, 7(4), 90-105

Aslan, A., Kaplan, M., & Kula, F. (2008). *International Tourism Demand for Turkey: A Dynamic Panel Data Approach.* Kayseri: University of Erciyes.

Agiomirgianakis, G., Serenis, D., & Tsounis, N. (2015). The effects of exchange rate volatility on tourist flow: evidence from the UK and Sweden. *International Journal of Tourism Policy*, *6*(1), 1. doi: 10.1504/ijtp.2015.075128

Bamberger, M. (1999). *Integrating quantitative and qualitative research : lessons from the field.* Washington, D.C.: World Bank.

Claret, M. (2014). Exchange Rates and Tourism: Evidence from The Island of Guam, 165-187.

Cochran, W. G. (2006). *Sampling techniques.* New York: Wiley.

Dritsakis, N. (2004). *Cointegration Analysis of German and British Tourism Demand For Greece.* Thessaloniki: University of Macedonia.

Huseyni, I., Doru, Ö., & Tunc, A. (2017). The Effects of Tourism Revenues on Economic Growth in The Context of Neo-Classical Growth Model: in The Case of Turkey. *Ecoforum Journal*.

International Monetary Fund . (2017). *Turkey.* Washington DC: International Monetary Fund .

Küçükaltan, D., & Terzioğlu, M. K. (2013). Economic impact of tourism demand: evidence from Turkey. *Anatolia: An International Journal of Tourism and Hospitality Research*.

Kunwar, R & Limbu. B (2015). Tourism and Earthquake: A Case Study of Nepal and Turkey. *Nepal Association of Tour & Travel Agents*

Işık, N., & Bostancıeri, B. (2017). Analysis of The Tourism Flows from Europe to Turkey with Panel Gravity Model. *International Journal of Contemporary Tourism Research*, *1*(2), 1-15. DOI: 10.30625/ijctr.356313

Pruzan, P. (2016). *Research methodology : the aims, practices and ethics of science.* Cham: Springer.

Saray, O. M., & Karagoz, K. (2010). Determinants of Tourist Inflows in Turkey: Evidence From Panel Gravity Model. *Journal of Social Sciences*, 33-46.

Trading Economics Data Base, Using internet

Turkish Statistical Institute(TurkStat). Using internet

T. Bieger, A. Wittmer (2006). *Air transport and tourism—Perspectives and challenges for Destinations*. airlines and governments Journal of Air Transport Management 12 (2006) 40–46

World Bank, World Bank Data Bank. Using internet

Xhiliola Agaraj & Merita Murati, 2009. "Tourism an Important Sector of Economy Development," Annals - Economy Series, Constantin Brancusi University, Faculty of Economics, vol. 1, pages 83-90, May.

Yurtseven, C. (2010). International Tourism and Economic Development in Turkey: A Vector Approach. *Afro Eurasian Studies*, *1*(2), 37-50.

Appendix

Table 1: Raw Data

Quarter	LN(TD)	LN(GDPpC)	LN(G)	LN(TP)	Seasonal	Shocks
Q1'1996	(0.55)	8.21	8.47	3.68	-	-
Q2'1996	0.12	8.07	8.63	4.56	1.00	-
Q3'1996	0.46	8.17	8.69	4.47	1.00	-
Q4'1996	(0.24)	8.42	8.46	3.84	-	-
Q1'1997	(0.71)	8.20	8.55	3.64	-	-
Q2'1997	0.20	8.27	8.23	3.84	1.00	-
Q3'1997	0.58	8.03	8.53	3.80	1.00	-
Q4'1997	(0.25)	8.27	9.13	3.37	-	-
Q1'1998	(0.95)	8.29	8.95	4.21	-	-
Q2'1998	0.07	8.35	8.51	3.32	1.00	-
Q3'1998	0.39	8.02	8.88	3.57	1.00	-
Q4'1998	(0.30)	8.05	9.15	3.54	-	-
Q1'1999	(1.10)	8.07	9.09	5.43	-	-
Q2'1999	(0.40)	8.12	9.07	4.31	1.00	1.00
Q3'1999	0.09	8.07	8.90	4.37	1.00	1.00
Q4'1999	(0.66)	8.38	8.94	4.89	-	-
Q1'2000	(1.34)	8.47	8.91	6.50	-	-
Q2'2000	0.07	8.21	9.10	5.31	1.00	-
Q3'2000	0.53	7.91	8.42	5.43	1.00	-
Q4'2000	(0.18)	7.71	9.38	5.56	-	-

Q1'2001	(0.88)	8.46	8.66	6.86	-	-
Q2'2001	0.34	8.15	7.85	6.07	1.00	-
Q3'2001	0.63	7.95	8.11	6.41	1.00	-
Q4'2001	(0.24)	7.82	9.54	6.29	-	-
Q1'2002	(0.73)	7.98	8.30	7.62	-	-
Q2'2002	0.43	8.10	8.71	7.00	1.00	-
Q3'2002	0.87	8.59	9.00	6.87	1.00	-
Q4'2002	0.06	8.01	9.44	6.89	-	-
Q1'2003	(0.83)	8.53	9.31	8.02	-	-
Q2'2003	0.32	8.35	8.67	7.58	1.00	-
Q3'2003	0.97	8.43	9.27	7.59	1.00	-
Q4'2003	0.18	8.15	9.40	7.56	-	-
Q1'2004	(0.47)	8.60	9.36	8.47	-	-
Q2'2004	0.68	8.78	9.05	7.79	1.00	-
Q3'2004	1.11	8.03	8.90	7.58	1.00	-
Q4'2004	0.31	8.58	10.04	7.52	-	-
Q1'2005	(0.24)	8.35	9.62	8.28	-	-
Q2'2005	0.84	8.62	9.07	7.92	1.00	-
Q3'2005	1.21	8.71	9.75	7.83	1.00	-
Q4'2005	0.35	8.64	9.94	7.68	-	-
Q1'2006	(0.47)	8.59	8.88	8.29	-	-
Q2'2006	0.80	8.86	9.85	8.23	1.00	-
Q3'2006	1.18	8.45	9.66	7.86	1.00	-

Q4'2006	0.18	8.75	10.31	7.60	-	-
Q1'2007	(0.32)	8.80	9.45	8.39	-	-
Q2'2007	0.93	8.82	10.12	8.36	1.00	-
Q3'2007	1.36	8.97	9.15	8.34	1.00	-
Q4'2007	0.33	8.71	10.70	7.99	-	-
Q1'2008	(0.18)	8.56	9.98	8.41	-	-
Q2'2008	1.08	8.87	10.19	8.66	1.00	-
Q3'2008	1.44	8.91	9.43	8.52	1.00	-
Q4'2008	0.39	9.13	10.69	8.07	-	-
Q1'2009	(0.37)	9.13	9.80	8.31	-	-
Q2'2009	1.05	8.71	10.26	8.60	1.00	-
Q3'2009	1.49	8.70	9.51	8.56	1.00	-
Q4'2009	0.49	8.09	10.64	8.13	-	-
Q1'2010	(0.29)	8.74	9.89	8.63	-	-
Q2'2010	1.16	9.14	10.40	8.74	1.00	-
Q3'2010	1.52	8.55	10.27	8.75	1.00	-
Q4'2010	0.51	8.53	10.44	8.29	-	-
Q1'2011	(0.20)	9.15	10.05	9.07	-	-
Q2'2011	1.27	8.95	10.15	8.89	1.00	-
Q3'2011	1.55	8.84	10.27	9.07	1.00	-
Q4'2011	0.57	8.59	10.51	8.51	-	-
Q1'2012	(0.22)	9.19	10.24	8.91	-	-
Q2'2012	1.24	8.79	10.26	9.10	1.00	-

Q3'2012	1.62	9.07	10.30	9.32	1.00	-
Q4'2012	0.59	8.37	10.55	8.74	-	-
Q1'2013	(0.12)	8.94	10.48	9.10	-	-
Q2'2013	1.31	8.88	9.56	9.62	1.00	-
Q3'2013	1.67	9.09	10.20	9.48	1.00	-
Q4'2013	0.66	8.84	10.96	9.03	-	-
Q1'2014	(0.22)	9.29	10.27	9.58	-	-
Q2'2014	1.38	8.40	10.55	9.78	1.00	-
Q3'2014	1.73	9.04	9.78	9.71	1.00	-
Q4'2014	0.63	8.92	10.76	9.37	-	-
Q1'2015	(0.17)	8.64	10.08	9.65	-	-
Q2'2015	1.30	8.88	10.05	10.41	1.00	-
Q3'2015	1.68	8.79	10.44	10.40	1.00	-
Q4'2015	0.62	8.84	10.55	10.11	-	-
Q1'2016	(0.38)	8.89	10.45	9.48	-	-
Q2'2016	0.53	8.62	10.17	8.18	1.00	1.00
Q3'2016	1.02	8.68	10.33	8.89	1.00	1.00
Q4'2016	0.26	8.82	10.51	10.23	-	-
Q1'2017	(0.62)	9.07	10.50	10.36	-	-
Q2'2017	1.10	8.67	9.77	11.03	1.00	-
Q3'2017	1.59	8.92	10.01	11.01	1.00	-
Q4'2017	0.42	8.58	10.76	10.62	-	-
Q1'2018	(0.24)	9.02	9.97	10.28	-	-

Q2'2018	1.39	8.96	9.48	10.79	1.00	-
Q3'2018	1.76	8.99	10.31	10.69	1.00	-
Q4'2018	0.77	8.57	10.73	10.62	-	-

Table 2: ADF tests at level

Null Hypothesis: LNTD has a unit root				
Exogenous: Constant				
Lag Length: 8 (Automatic - based on AIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-1.339022	0.608
Test critical values:	1% level		-3.511262	
	5% level		-2.896779	
	10% level		-2.585626	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNTD)				
Method: Least Squares				
Date: 02/03/20 Time: 17:40				
Sample (adjusted): 10 92				
Included observations: 83 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNTD(-1)	-0.060103	0.044886	-1.339022	0.1847
D(LNTD(-1))	-0.113196	0.112972	-1.001989	0.3197
D(LNTD(-2))	-0.34226	0.109452	-3.127038	0.0025
D(LNTD(-3))	-0.062819	0.116462	-0.539391	0.5913
D(LNTD(-4))	0.312637	0.114212	2.737339	0.0078
D(LNTD(-5))	-0.185407	0.116614	-1.589914	0.1162
D(LNTD(-6))	0.023831	0.1182	0.20162	0.8408
D(LNTD(-7))	-0.2642	0.109639	-2.40973	0.0185
D(LNTD(-8))	0.353974	0.111442	3.176309	0.0022
C	0.047125	0.025789	1.827325	0.0717
R-squared	0.972853	Mean dependent var		0.020689
Adjusted R-squared	0.969507	S.D. dependent var		0.920465
S.E. of regression	0.160735	Akaike info criterion		-0.705537
Sum squared resid	1.886008	Schwarz criterion		-0.414111
Log likelihood	39.2798	Hannan-Quinn criter.		-0.588458
F-statistic	290.678	Durbin-Watson stat		1.901441
Prob(F-statistic)	0			

Null Hypothesis: LNGDP has a unit root				
Exogenous: Constant				
Lag Length: 5 (Automatic - based on AIC, maxlag=11)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-1.030071	0.7394
Test critical values:	1% level		-3.508326	
	5% level		-2.895512	
	10% level		-2.584952	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNGDP)				
Method: Least Squares				
Date: 02/03/20 Time: 17:41				
Sample (adjusted): 7 92				
Included observations: 86 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP(-1)	-0.093445	0.090717	-1.030071	0.3061
D(LNGDP(-1))	-0.825645	0.133554	-6.182109	0
D(LNGDP(-2))	-0.704384	0.154668	-4.554168	0
D(LNGDP(-3))	-0.672906	0.152144	-4.422815	0
D(LNGDP(-4))	-0.388043	0.144551	-2.68447	0.0088
D(LNGDP(-5))	-0.22768	0.11073	-2.056171	0.0431
C	0.829035	0.777955	1.06566	0.2898
R-squared	0.494672	Mean dependent var		0.00342
Adjusted R-squared	0.456293	S.D. dependent var		0.343554
S.E. of regression	0.253325	Akaike info criterion		0.169601
Sum squared resid	5.069692	Schwarz criterion		0.369373
Log likelihood	-0.292824	Hannan-Quinn criter.		0.25
F-statistic	12.88904	Durbin-Watson stat		1.972105
Prob(F-statistic)	0			

Null Hypothesis: LNTP has a unit root				
Exogenous: Constant				
Lag Length: 5 (Automatic - based on AIC, maxlag=11)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-1.620663	0.4678
Test critical values:	1% level		-3.508326	
	5% level		-2.895512	
	10% level		-2.584952	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNTP)				
Method: Least Squares				
Date: 02/03/20 Time: 17:41				
Sample (adjusted): 7 92				
Included observations: 86 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNTP(-1)	-0.03835	0.023663	-1.620663	0.1091
D(LNTP(-1))	-0.142448	0.103856	-1.371588	0.1741
D(LNTP(-2))	-0.362983	0.10088	-3.598173	0.0006
D(LNTP(-3))	-0.431841	0.095958	-4.500309	0
D(LNTP(-4))	0.285111	0.099223	2.873427	0.0052
D(LNTP(-5))	-0.321708	0.103147	-3.118921	0.0025
C	0.460266	0.192603	2.389711	0.0192
R-squared	0.536211	Mean dependent var		0.07881
Adjusted R-squared	0.500987	S.D. dependent var		0.592701
S.E. of regression	0.418689	Akaike info criterion		1.174517
Sum squared resid	13.84877	Schwarz criterion		1.374289
Log likelihood	-43.50422	Hannan-Quinn criter.		1.254916
F-statistic	15.2227	Durbin-Watson stat		2.040337
Prob(F-statistic)	0			

Null Hypothesis: LNG has a unit root				
Exogenous: Constant				
Lag Length: 3 (Automatic - based on AIC, maxlag=11)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-1.424432	0.5669
Test critical values:	1% level		-3.506484	
	5% level		-2.894716	
	10% level		-2.584529	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNG)				
Method: Least Squares				
Date: 02/03/20 Time: 17:42				
Sample (adjusted): 5 92				
Included observations: 88 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNG(-1)	-0.085922	0.06032	-1.424432	0.1581
D(LNG(-1))	-0.928131	0.095504	-9.71821	0
D(LNG(-2))	-0.828722	0.106854	-7.755636	0
D(LNG(-3))	-0.637987	0.086691	-7.359334	0
C	0.891954	0.582842	1.530354	0.1297
R-squared	0.645496	Mean dependent var		0.025876
Adjusted R-squared	0.628411	S.D. dependent var		0.60922
S.E. of regression	0.371369	Akaike info criterion		0.911898
Sum squared resid	11.44693	Schwarz criterion		1.052656
Log likelihood	-35.12353	Hannan-Quinn criter.		0.968606
F-statistic	37.78247	Durbin-Watson stat		2.048623
Prob(F-statistic)	0			

Table 3: ADF tests at 1st difference

Null Hypothesis: D(LNTD) has a unit root				
Exogenous: Constant				
Lag Length: 7 (Automatic - based on AIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.084101	0.0316
Test critical values:	1% level		-3.511262	
	5% level		-2.896779	
	10% level		-2.585626	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNTD,2)				
Method: Least Squares				
Date: 02/03/20 Time: 17:41				
Sample (adjusted): 10 92				
Included observations: 83 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNTD(-1))	-1.489461	0.482948	-3.084101	0.0029
D(LNTD(-1),2)	0.33221	0.43753	0.759285	0.4501
D(LNTD(-2),2)	-0.048432	0.399174	-0.12133	0.9038
D(LNTD(-3),2)	-0.141282	0.354477	-0.398565	0.6914
D(LNTD(-4),2)	0.150843	0.315918	0.477474	0.6344
D(LNTD(-5),2)	-0.06568	0.250942	-0.261733	0.7943
D(LNTD(-6),2)	-0.06456	0.174955	-0.369009	0.7132
D(LNTD(-7),2)	-0.34373	0.111773	-3.075242	0.0029
C	0.022641	0.018283	1.238343	0.2195
R-squared	0.986679	Mean dependent var		-0.00352
Adjusted R-squared	0.985239	S.D. dependent var		1.330063
S.E. of regression	0.161594	Akaike info criterion		-0.70537
Sum squared resid	1.932331	Schwarz criterion		-0.44309
Log likelihood	38.27282	Hannan-Quinn criter.		-0.6
F-statistic	685.164	Durbin-Watson stat		1.888437
Prob(F-statistic)	0			

Null Hypothesis: D(LNGDP) has a unit root				
Exogenous: Constant				
Lag Length: 4 (Automatic - based on AIC, maxlag=11)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-7.755868	0
Test critical values:	1% level		-3.508326	
	5% level		-2.895512	
	10% level		-2.584952	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNGDP,2)				
Method: Least Squares				
Date: 02/03/20 Time: 17:41				
Sample (adjusted): 7 92				
Included observations: 86 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	-4.047137	0.521816	-7.755868	0
D(LNGDP(-1),2)	2.142545	0.454566	4.713389	0
D(LNGDP(-2),2)	1.374357	0.346051	3.971542	0.0002
D(LNGDP(-3),2)	0.655841	0.229821	2.853704	0.0055
D(LNGDP(-4),2)	0.24084	0.110033	2.1888	0.0315
C	0.028192	0.027629	1.020387	0.3106
R-squared	0.830728	Mean dependent var		-0.00586
Adjusted R-squared	0.820148	S.D. dependent var		0.597566
S.E. of regression	0.253421	Akaike info criterion		0.159686
Sum squared resid	5.137783	Schwarz criterion		0.33092
Log likelihood	-0.866511	Hannan-Quinn criter.		0.2286
F-statistic	78.52239	Durbin-Watson stat		1.974255
Prob(F-statistic)	0			

Null Hypothesis: D(LNTP) has a unit root				
Exogenous: Constant				
Lag Length: 7 (Automatic - based on AIC, maxlag=11)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.633849	0.007
Test critical values:	1% level		-3.511262	
	5% level		-2.896779	
	10% level		-2.585626	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNTP,2)				
Method: Least Squares				
Date: 02/03/20 Time: 17:42				
Sample (adjusted): 10 92				
Included observations: 83 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNTP(-1))	-1.975127	0.543536	-3.633849	0.0005
D(LNTP(-1),2)	0.82071	0.49852	1.646292	0.1039
D(LNTP(-2),2)	0.425345	0.448745	0.947855	0.3463
D(LNTP(-3),2)	0.02857	0.384158	0.07437	0.9409
D(LNTP(-4),2)	0.251353	0.328229	0.765787	0.4462
D(LNTP(-5),2)	-0.051373	0.244555	-0.210067	0.8342
D(LNTP(-6),2)	-0.026603	0.17161	-0.155021	0.8772
D(LNTP(-7),2)	-0.089148	0.112206	-0.794505	0.4294
C	0.157736	0.064508	2.445227	0.0169
R-squared	0.820061	Mean dependent var		-0.01093
Adjusted R-squared	0.800608	S.D. dependent var		0.958792
S.E. of regression	0.428133	Akaike info criterion		1.243327
Sum squared resid	13.56405	Schwarz criterion		1.505611
Log likelihood	-42.59808	Hannan-Quinn criter.		1.348698
F-statistic	42.15617	Durbin-Watson stat		1.782434
Prob(F-statistic)	0			

Null Hypothesis: D(LNG) has a unit root				
Exogenous: Constant				
Lag Length: 2 (Automatic - based on AIC, maxlag=11)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-15.08715	0.0001
Test critical values:	1% level		-3.506484	
	5% level		-2.894716	
	10% level		-2.584529	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNG,2)				
Method: Least Squares				
Date: 02/03/20 Time: 17:42				
Sample (adjusted): 5 92				
Included observations: 88 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNG(-1))	-3.506976	0.232448	-15.08715	0
D(LNG(-1),2)	1.517463	0.172869	8.778109	0
D(LNG(-2),2)	0.652867	0.086585	7.540213	0
C	0.063667	0.039972	1.592785	0.115
R-squared	0.882692	Mean dependent var		0.007458
Adjusted R-squared	0.878502	S.D. dependent var		1.071926
S.E. of regression	0.373637	Akaike info criterion		0.913323
Sum squared resid	11.72676	Schwarz criterion		1.025929
Log likelihood	-36.18621	Hannan-Quinn criter.		0.958689
F-statistic	210.6872	Durbin-Watson stat		2.049036
Prob(F-statistic)	0			

Table 4: ARDL

Dependent Variable: LNTD				
Method: ARDL				
Date: 02/03/20 Time: 20:05				
Sample (adjusted): 8 92				
Included observations: 85 after adjustments				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (8 lags, automatic): LNGDP LNTP LNG				
Fixed regressors: C @TREND				
Number of models evalulated: 729				
Selected Model: ARDL(1, 6, 6, 4)				
Note: final equation sample is larger than selection sample				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNTD(-1)	0.12794	0.105067	1.217698	0.2275
LNGDP	-0.141973	0.188107	-0.754747	0.453
LNGDP(-1)	0.672077	0.191313	3.512971	0.0008
LNGDP(-2)	0.388902	0.190748	2.038821	0.0453
LNTP	0.085208	0.085683	0.994462	0.3235
LNTP(-1)	0.114077	0.086523	1.318463	0.1917
LNG	-0.288475	0.128191	-2.250363	0.0276
LNG(-1)	-0.347712	0.120591	-2.883386	0.0052
LNG(-2)	0.418772	0.128077	3.269701	0.0017
LNG(-3)	0.270078	0.135368	1.995142	0.05
LNG(-4)	-0.306388	0.134569	-2.276813	0.0259
LNG(-5)	-0.551004	0.125925	-4.375654	0
LNG(-6)	0.26217	0.134084	1.95527	0.0546
LNG(-7)	0.563926	0.124762	4.520019	0
C	-8.610362	2.188315	-3.9347	0.0002
@TREND	-0.013174	0.007253	-1.816444	0.0736
R-squared	0.804991	Mean dependent var		0.442563
Adjusted R-squared	0.762598	S.D. dependent var		0.76664
S.E. of regression	0.373537	Akaike info criterion		1.036326
Sum squared resid	9.627556	Schwarz criterion		1.496119
Log likelihood	-28.04385	Hannan-Quinn criter.		1.221267
F-statistic	18.98869	Durbin-Watson stat		1.862863
Prob(F-statistic)	0			
*Note: p-values and any subsequent tests do not account for model selection.				

Table 5: Long Run Model

Dependent Variable: LNTD				
Method: Least Squares				
Date: 02/03/20 Time: 17:50				
Sample (adjusted): 7 92				
Included observations: 86 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP(-6)	-0.372613	0.087049	-4.280503	0.0050
LNTP(-6)	0.177828	0.024766	7.180336	0.0320
LNG(-4)	0.178035	0.084558	2.105484	0.0383
SEASONAL	1.21117	0.080298	15.08337	0.0000
SHOCKS	-0.591246	0.179569	-3.292589	0.0215
R-squared	0.811857	Mean dependent var		0.444187
Adjusted R-squared	0.802566	S.D. dependent var		0.762266
S.E. of regression	0.338702	Akaike info criterion		0.728986
Sum squared resid	9.292216	Schwarz criterion		0.871681
Log likelihood	-26.3464	Hannan-Quinn criter.		0.786414
Durbin-Watson stat	1.808033			

Table 6: Short Run Model

Dependent Variable: D(LNTD)				
Method: Least Squares				
Date: 02/03/20 Time: 18:01				
Sample (adjusted): 8 92				
Included observations: 85 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-6))	-0.350935	0.169456	-2.070951	0.0416
D(LNTP(-6))	-0.037423	0.09714	-0.385253	0.7011
D(LNG(-4))	-0.141252	0.089625	-1.576042	0.119
SEASONAL	0.42379	0.100185	4.230069	0.0001
SHOCKS	-0.310334	0.259039	-1.198021	0.2345
ECM(-1)	-1.806568	0.203393	-8.882174	0.0000
R-squared	0.731279	Mean dependent var		0.002161
Adjusted R-squared	0.714272	S.D. dependent var		0.917395
S.E. of regression	0.49038	Akaike info criterion		1.480701
Sum squared resid	18.99734	Schwarz criterion		1.653124
Log likelihood	-56.9298	Hannan-Quinn criter.		1.550054
Durbin-Watson stat	1.375365			

Table 7: Optimal Lag Structure

VAR Lag Order Selection Criteria						
Endogenous variables: LNGDP						
Exogenous variables: C						
Date: 02/03/20 Time: 17:36						
Sample: 1 92						
Included observations: 84						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-34.87858	NA	0.13757	0.854252	0.88319	0.865885
1	-18.88228	31.23088	0.096263	0.497197	0.555074	0.520463
2	-11.80099	13.65678	0.083289	0.352404	0.439219	0.387303
3	-10.30452	2.850417	0.082313	0.340584	0.456337	0.387116
4	-4.422402	11.06398	0.073285	0.224343	0.369034*	0.282508
5	-3.026248	2.592858	0.072605	0.214911	0.38854	0.284708
6	-0.846729	3.995785*	0.070604*	0.186827*	0.389395	0.268258*
7	-0.829874	0.030499	0.07229	0.210235	0.441741	0.303299
8	0.449056	2.283804	0.07183	0.203594	0.464039	0.30829
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

VAR Lag Order Selection Criteria						
Endogenous variables: LNTP						
Exogenous variables: C						
Date: 02/03/20 Time: 17:37						
Sample: 1 92						
Included observations: 84						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-168.0819	NA	3.28013	4.025759	4.054697	4.037392
1	-72.74785	186.1283	0.347095	1.779711	1.837587	1.802977
2	-69.32684	6.597664	0.32766	1.722068	1.808883	1.756967
3	-67.30725	3.846837	0.319815	1.697792	1.813545	1.744324
4	-51.66314	29.42583	0.225685	1.349122	1.493814	1.407287
5	-46.56235	9.472893	0.204712	1.251485	1.425114	1.321282
6	-41.56619	9.159637*	0.186159*	1.156338*	1.358906*	1.237768*
7	-41.55802	0.014782	0.190644	1.179953	1.411459	1.273016
8	-41.33885	0.391367	0.19427	1.198544	1.458989	1.303241
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

VAR Lag Order Selection Criteria						
Endogenous variables: LNG						
Exogenous variables: C						
Date: 02/03/20 Time: 17:34						
Sample: 1 92						
Included observations: 84						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-90.47175	NA	0.516863	2.177899	2.206837	2.189532
1	-69.87471	40.21328	0.324145	1.711303	1.769179	1.734568
2	-59.87997	19.27556	0.261661	1.497142	1.583957	1.532041
3	-55.20156	8.911259	0.23973	1.409561	1.525314	1.456093
4	-33.02286	41.71708*	0.144796*	0.905306*	1.049998*	0.963471*
5	-32.96213	0.112782	0.148086	0.92767	1.1013	0.997468
6	-32.8866	0.138486	0.151403	0.949681	1.152249	1.031112
7	-32.49317	0.711916	0.153635	0.964123	1.195629	1.057187
8	-31.82653	1.190431	0.154898	0.97206	1.232505	1.076757
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						