Economic Sentiment Indicator as a Demand Determinant in Tourism: A Case of Turkey

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ABSTRACT

Tourism is one of the fastest growing industries in the world, employing approximately 220 million people and generating over 9.4% of the world's GDP. The growing contribution of tourism is accompanied by an increased interest in understanding the major factors which influence visitation levels to those countries. Therefore, finding the right variables to understand and estimate tourism demand becomes very important and challenging in policy formulations. The purpose of this study is to introduce Economic Sentiment Indicator (ESI) to the field of tourism demand studies. Using ESI in demand analysis, this study will assist in the ability to tap into individuals' hopes and/or worries for the present and future.

The study developed a demand model in which the number of tourist arrivals to Turkey from select EU countries is used as the dependent variable. ESI along with more traditional variables such as Interest Rate, Relative Price, and Relative Exchange Rate were brought into the model as the independent demand determinants. The study utilized such econometric models as ARIMA for seasonality adjustment and ARDL Bound test approach to cointegration for the long and short-run elasticities. ESI was statistically significant in 8 countries out of 13, three of those countries had a negative coefficient and five had a positive sign as proposed by the study.

The study posits that ESI is a good indicator to gauge and monitor tourism demand and adding the visitors' state of mind into the demand equation could reduce errors and increase variance in arrivals. Policy makers should monitor ESI as it fluctuates over time. Since we do not have direct influence on travelers' demand for tourism, it is imperative that we use indirect approaches such as price adjustment and creating new packages or promotional expenditures in order to influence or induce demand. Using this information generated from the study, government officials and tourism suppliers could adjust their promotional activities and expenditures in origin countries accordingly.

DEDICATION

I dedicated this work to my one and only love, my wife Damla. You are the most important person beyond description. Without your support and encouragement this could not have been possible.

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CHAPTER ONE: INTRODUCTION

1.1. INTRODUCTION

Tourism is one of the fastest growing industries in the world and plays a key role in the economic development of large number of countries, employing approximately 220 million people and generating over 9.4% of the world's GDP (WTTC, 2009). According to the World Tourism Organization, in 2008 there were 922 million international tourist arrivals that generated US$ 944 billion or 30% of the world's export of services. Tourism is considered an important aspect of export activities, which generates foreign currency and income in addition to creating employment for many countries throughout the world.

The growing contribution of tourism has been accompanied by an increased interest in understanding the major factors which influence visitation levels to those countries (Koc & Altinay, 2007; Uysal & Crompton, 1984). While there are some arguments that tourism might not be beneficial to residents because of the price increases related to higher demand for goods (previously non-internationally traded goods), Clarke and and Ng (1995) showed that, these residents are always at least compensated by the income they earn as sellers of the same goods. To be able to capture the full benefit from tourism transactions, each country as a destination wants to know who the identity of its international visitors are and their tourism receipts in order to choose an appropriate strategy for its economic well-being (Akal, 2004).

Modeling tourism demand has been one of the most rigorously investigated areas of tourism studies. Analyzing both the effects of various demand determinants and accurately forecasting the future demand for tourism are the two major focuses of tourism demand studies (Song, Li, & Witt, 2008). Governments and investors need to know the factors affecting the destination choice and the type of trips in order to create effective marketing and strategic planning decisions (Kim & Uysal, 1998). Therefore finding the right variables to understand and estimate tourism demand becomes very important and challenging in policy formulations.

Turner et al, (1998) studied the differences and similarities for different types of visiting purposes on demand to be able to understand the effects on the tourism industry. Similarly, most of the tourism demand studies published over the years have attempted to find the right model and correct variables to better understand the relationship between economic conditions and tourism demand in general. Most of the variables used in demand studies are able to explain certain aspects of the tourism demand, but little, if any research has been conducted on how the prospective tourists' state of mind regarding to their financial situation for both today and tomorrow may play a role in their demand for tourism. Thus, the objective of this study is to develop a demand model that incorporates not only traditional demand determinants such as CPI, relative price, and exchange rate, but also incorporates Economic Sentiment Indicator (ESI) as a new demand determinant into the model of tourism demand.

The addition of Economic Sentiment Indicator is intended to capture the extent to which tourists as consumers may have for the general state of the economy. It is a very difficult task to try to understand what and how people may think about their economic conditions. One of the problems with this approach is that generating such information is very difficult and costly for individual destinations. Fortunately, there is such an indicator called Economic Sentiment Indicator (ESI) which is created to gauge and monitor consumer sentiments about the general health of the economy. The ESI is a very valuable composite indicator in understanding European Union countries' economic health and well-being. There are different tools similar to this (Consumer Confidence Indices and such), but this study will employ ESI. The ESI was generated by the European Commission Directorate General for Economic and Financial Affairs and is now part of the European statistic tool called Eurostat. The survey for ESI uses about 125,000 firms and 40,000 consumers and is done every month across to EU countries. These surveys are essential to understand economic conditions, valuable for research and forecasting. Lower values of the indicator would imply that individuals as consumers do not perceive the health of the economy favorably, thus its poor perception may manifest itself in different consumption patterns and consumer behavior. There are five surveys conducted on a monthly basis for manufacturing, construction, consumers, retail trade and services (Eurostat, 2007).

Using the Economic Sentiment Indicator for demand analysis for this study will assist in the ability to tap into individuals' hopes and/or worries for the present and future. Therefore, the hypothesized model of this study will demonstrate if the economic sentiment indicator is a viable demand determinant along with traditional ones identified from previous studies. All things being equal, it is hypothesized that the higher the index score, the higher its effect on demand will be. The estimation of the model will use econometric models which cover ARIMA, ARDL, Cointegration, and Error Correction Models.

1.2. TOURISM IN TURKEY

Turkey is one of the fastest growing countries in the world for tourist arrivals, and tourism is becoming more important than ever as an economic engine for this moderately developed country. The Turkish government welcomed and invested in the idea of tourism for greatly needed foreign currency and to ease unemployment problems. The Mediterranean region and specifically Turkey has been the cradle of earlier civilizations and has played a main part for the some of the world's greatest cultures, including the Arab, Byzantine, Carthaginian, Egyptian, Greek, Ottoman, Phoenician, and Roman (Apostolopoulos & Sonmez, 2000). Turkey's Geography is surrendered on three sides by sea, which allows for varying temperature from the hotter Mediterranean to cooler Black sea. This geographical location has enabled more than 4000 years of diverse history and culture. While rich historical and cultural heritage may draw tourists for heritage- based tourism, the majority of tourists come for the beauty of Aegean and Mediterranean seas. Lately however, tourists have been drawn to the Black sea region because of the cooler climate and greener nature compared to southern part of the country.

A number of demand studies have been conducted for Turkey. Earlier works related to tourism demand heavily relied on the use of OLS (Ordinary Least Squares) regression models with double-log forms using available data points. For example, Uysal and Crompton, (1984) used OLS with double logarithmic forms for arrivals and expenditures to generate country-specific demand models for a select group of European countries. The data used covered the years of 1960-1980 when there were a severe economic downturn and political unrest. More recent research by Var et al, (1990) studied data from 1979 to 1987 when the country was stable and tourism was accelerating. On the other hand, Icoz et al, (1998) used supply-related factors influencing tourism demand to Turkey. Akis (1998) also used data from 1980-1993 with OLS double logarithmic regression analysis to determine tourism demand for Turkey. In subsequent years, some econometric models considering problems that relate to time series started to show up. Using lagged variables and first - order autoregressive data Akal (2004) was able to forecast the time periods of 2002-2007 based on 1963-2001 data points (Akal, 2004). Halicioglu (2005) utilized an ARDL model to estimate the elasticities for period of 1960 to 2002. Baum and Mudambi also (1996) studied to isolate the characteristics that explain tourist expenditure based on the tourist originating countries to Turkey.

During the 1980's through the 1990's the government encouraged investments, and the Turkish government has directly invested more money to promote tourism than any country in the world (Uysal & Crompton, 1984) thus creating a booming tourism industry. Following statistics will give an idea to show how fast tourism grew in Turkey:

- In 1984, there were 68,266 beds in Turkey but by the 2007 this figure went up to 532,262 beds, almost 700% increase in little over 20 years.
- Similarly in 1985, the number of total tourist arrivals was about 2.6 million, by 2007, this figure reached 23.3 million, an increase of 800%.
- As of 2007, the rate of tourism receipts in export earning was 17.3% comparing to 2-3% by the late sixties.
- In 2009, travel and tourism investment was estimated to be 10% of total investment in Turkey.

- In 2009 employment (direct + indirect) was estimated at 6.4% of the employment total.
- Today, the number of tourist arrivals is about 28 million in Turkey.

1.3. STATEMENT OF THE PROBLEM

Turkey is one of the fastest growing countries in the world for tourist arrivals, and tourism is becoming more important than ever as an economic engine for this moderately developed country. The Turkish government welcomed and invested in the idea of tourism for highly needed foreign currency and to ease the unemployment problem in the country. Finding the correct estimation model and right variables is very important for both academics and policy makers. Without the right tools, policy makers might not be able to correctly determine the future demand.

Most of tourism demand studies published over the years have attempted to find the right models or right variables to correctly estimate tourism demand. Moreover, most of these studies published have focused on the variables related to monetary values measured by income, exchange rate and such, consumer choice in tastes and preferences were also included in some of these studies. Ayres, (1998) argues that," by treating demand as a reaction to price, quality and competition, orthodox theory fails to take account of how consumer choice is formed. There is increasing evidence that consumer choice is agonistic, rooted in culture and reflected in life-style. The consumer has a strong notion of what he or she wants and is therefore at the same time rejecting" (p.353). While this study does not use cultural and life style issues as variables it attempts to understand the consumers' minds from the perspective of economic approach. There are no studies that focused on what the prospective tourists' state of mind regarding to their financial situation currently and in the future within in the context of demand estimation. One of the problems with this approach was that, it is very hard and costly to collect that kind of information, fortunately there are some information already collected by government agencies around the world namely, Economic Sentiment Indicator (ESI) (There are some other methods and estimates such as Consumer Confidence Index). ESI tries to predict the health of the economy via surveying people and asking what they think about the current and the future of the economy, the Economic Sentiment Indicator can allow us to tap into people's hopes and/or worries for today and tomorrow. Therefore, using such an index as ESI with ARIMA, ARDL, Cointegration, and Error Correction Models may reveal information that may shed further light on our understanding of tourism demand and its determinants.

This study will generate information that will enable policy makers and destination managers to assess the relative importance of demand determinants for the select countries. The study will also demonstrate the usefulness of Economic Sentiment Indicator as an important demand determinant in tourism demand estimations models. The elasticities to be obtained from the double-log form of the model will also reveal the level of demand responsiveness to changes in cost of living, exchange rate differentials, interest rates and Economic Sentiment Indicator. Knowing how such variables affect demand would help policy makers to develop appropriate measures to encourage demand from EU countries.

1.4. HYPOTHESES

The general hypothesis of the study is that tourist arrivals from the selected countries of EU can be explained as a function of ESI, Relative Price, Exchange Rate, and Interest Rate. Accordingly, the study has four separate hypotheses.

H_1= Economic Sentiment Indicator positively affects Tourist Arrivals

It is hypothesized that when people think that current and future economic conditions are favorable then they are more likely to spend money. For that underlying reason it is expected that ESI will positively affect tourism demand.

H_2= Relative Price negatively affects Tourist Arrivals

Relative Price is an exchange rate adjusted pricing index, which indicates that if prices are higher or becomes higher over time, then destination prices will be higher and there will be less tourist arrivals. The expected sign is then negative.

H_3= Exchange Rate positively affects Tourist Arrivals

Exchange rate is the value of origin countries' currency in the terms of the destination country's currency. In a sense it shows how much of the one country's money worth in the terms of other country's money. People are more aware of this variable than others, like cost of living (Artus, 1970) and Exchange rate is hypothesized to positively affect the tourist arrivals.

H_4= Interest Rate negatively affects Tourist Arrivals

One of the least used variables in tourism demand is interest rate; this variable can be an important determinant in demand studies, because it affects not only loans that consumer gets but credit cards and other parts of the economy. It is therefore hypothesized that interest rates negatively affect the tourist arrivals.

CHAPTER TWO: REVIEW OF LITERATURE AND DEMAND MODELS

2. LITERATURE REVIEW

2.1. VARIABLES

There are more than 110 post-1990 econometrics studies listed in the Advanced Econometrics of Tourism Demand (Song, et al., 2008). Seventy-five studies have used annual data, 25 used quarterly data and 10 used monthly data (2 did not report any data use). The majority of these papers used tourist arrivals as a dependent variable to measure demand directly, or indirectly adjusting with other variables. There were 82 studies that used tourist arrivals as their dependent variable. Second most commonly used dependent variable was tourist expenditures/receipts, there were 23 studies that used tourist expenditure/receipt related dependent variable, four studies also used tourism imports and tourism exports data as a dependent variable. Number of nights spent also used as a dependent variable in several cases. Additionally, number of inclusive tour charters, number of tourist accommodations, travel propensity and Gini-coefficients were also utilized.

There are also varieties of independent variables used. The most commonly used independent variable was income in origin country which was used in 83 studies of 110 post 1990 demand studies, exchange rate adjusted relative price were used 79 times, dummy variables were also used 73 times, substitute prices were used 43 times, exchange rate was also one of the most used independent variable in international tourism demand studies, travel cost (airfare) used 26 times, and deterministic (linear) trend used 22 times.

The following section will explain further in detail some of commonly used dependent and independent variables.

2.1.1. DEPENDENT VARIABLES

Tourist Arrival

Tourist arrivals data indicate the total number of tourists to a destination country from visitor generating countries and the variable of tourist arrivals is most commonly used dependent variable in tourism demand studies (Crouch, Schultz, & Valerio, 1992; Kulendran, 1996; Song, Wong, & Chon, 2003; Uysal & Crompton, 1984; Var, et al., 1990). While majority of research has directly used raw tourist arrivals, there were also tourist arrivals divided by population (Crouch, et al., 1992; Witt & Witt, 1991), tourist arrivals for holidays (Morley, 1998), for visiting friends and relatives (Kulendran & Witt, 2003; Turner, et al., 1998), and for business trips (Kulendran & Witt, 2003). Tourist Arrival information is easier to obtain because most countries require international tourists to register or pass through visa process at the borders.

Tourist Expenditure

Tourist expenditure is calculated by multiplying total tourist arrivals times per capita expenditures of tourists, and is second mostly commonly used dependent variable (Di Matteo & Di Matteo, 1996; Jensen, 1998; Uysal & Roubi, 1999). It is also used in several different ways such as dividing expenditure to population (Li, Wong, Song, & Witt, 2006). This is very important especially for the local government and industry because it shows the real revenue generated from the visitors. This allows for valuation of the financial impact of tourist activity in real terms (Algieri, 2006).

Tourism Export and/or Imports

When tourists come and spend money for services and goods, it is considered a tourism export, similarly if own country's people go and spend on other countries' service and goods it is considered a tourism import. This variable is used as a dependent variable to explain tourists' spending patterns (Boo, Koh, & Jones, 2008; Egon Smeral, Witt, & Witt, 1992).

Number of Night Spent

Tourists' length of the stay has also been studied to understand the reasons for different length for different countries (Smallman & Moore, 2010). Number of nights spent by tourists is determined by multiplying average stay by tourist arrivals and is often used as a dependent variable (Cho, 2008). Brida and Risso, (2009) used overnights stays of international visitors in hotels and apartments in each of 116 destinations in South Tyrol. According to Jensen, (1998) nightly stay is a better predictor for tourism demand because change in the length of stay could signal for a shift in the real demand. Barros et al., (2008) used this for Portuguese tourists traveling to Latin American destinations, and find that longer staying tourists have larger budgets and often belong to higher social class, in addition, these types of tourists are more interested in nature, culture and gastronomy. According to Bakkal, (1991) despite some advantages to using this as a dependent variable there are also several disadvantages. First, only few of the tourists really check into registered accommodations. Second, there are different kinds of accommodations and pricing and that these places might be disregarded because of the price sensitivity of guests. Lastly, different governmental rules applied to define registered accommodations to gather information and not all countries provide this kind of information. But even with all the disadvantages there are studies that have considered this as a very important variable (Gokovali, Bahar, & Kozak, 2007).

This study will employ tourist arrivals or tourist expenditure as a dependent variable. Especially tourist arrivals' availability, consistency the way it is reported and compatibility among the origin countries make it excellent selection.

2.1.2. INDEPENDENT VARIABLES

Income

In economic theory, income effect explains how the change in income will impact the demand for a good or service. According to the theory, income and quantity demanded have a positive relationship, which means when income rises, so does the level of demand for goods and services. Income is one of the most important determinants and is widely used for tourism demand analysis. Usually it is calculated by dividing Gross Domestic Product (GDP) of a given country to population of that country and adjusting it with Consumer Price Index (CPI) as shown here.

$$Y = \frac{GDP}{POP * CPI}$$

Increases in income create higher purchasing power. While the assumption is that income is positively related to demand, this requires more information to able to determine the true nature of demand, because sometime an increase in income can create a negative impact on goods and services (i.e. inferior goods). For example, up to a certain income point, one can afford to go to country A but as s/he moves into higher income scales s/he might consider country B with an upper scale destination environment because s/he can afford it now. The other problem related to using this variable is that visitors from low-income countries may come from the highest income strata, while those from high-income countries may come from lower income groups (Baum & Mudambi, 1996). While some researchers have used the destination countries' income, most studies have used the origin countries' income (Akis 1998; Crouch, 1992; Gunadhi & Boey, 1986; Song & Witt, 2003; Uysal & El Roubi, 1999). How the income is determined depends on the measures and how the research study is designed. Some researchers used personal disposable income but others used GDP because they believe tourists arriving are mostly business travelers (Song, Wong, & Chon, 2003). There are also studies that have used whole World GDP. For example Algieri, (2006) finds that an increase of 1% in world GDP leads to a rise in Russian revenues of about 7.8%. This means that income tends to be the most important determinant of international tourism demand. Crouch (1992) believes that income elasticities of demand are quite varied in numerous studies carried over the years, which accounts for one reason that might be related to certain substantive and methodological features.

As seen from the extant literature review on demand, income, regardless of its model definitions, is very commonly used variable in demand studies, however this study will not use income as an independent variable, since the study uses monthly data points it will be difficult to disaggregate per capita income into monthly income, and more importantly, the use of ESI may already account or assume to account for the notion of income and the prosperity level of tourist generating countries, namely EU countries.

Price

Economic theory ensures that price must be included in demand studies (Crouch, 1994). However there are problems with getting the correct values to measure price. Different approaches created different use of the variable, but in general studies used exchange rates, price levels (CPI) and substitute prices. It is very hard to measure tourism prices, because the tourism product itself is not clearly defined. This is why many studies use CPI as a proxy for this variable (Carey, 1991). Smeral, (1996) also considers price to be used in demand reflecting the true social cost for endangered areas in a form of fee or tax. In general, it is accepted that the lower the price, the higher the demand it creates. However sensitivity of tourists might change the demand of leisure tourists if it is found to be more sensitive to price than demand by non-leisure tourists (Divisekera, 2010). Therefore, these two price proxies are the most used price variables.

Relative (Own) Price

Determining the cost of living in the destination country is difficult. Some studies use CPI (Consumer Pricing Index) for the cost of living, while others use exchange rates between countries because tourists often know more about exchange rates than CPI. While CPI is not considered reasonable measure for tourism price, because of convenience, and its potency to show average consumer spending patterns that which will be close proxy for tourism prices (Morley, 1994). Relative Price in a sense uses CPIs of countries and is usually adjusted by exchange rates. Calculation is as follows:

$$RP_{ij} = \frac{CPI_j / X_j}{CPI_i / X_i}$$

Where RP_{ij} is Relative Price in origin *i* for destination *j*, *CPI* is Consumer Price Index, *X* is Exchange Rate, *i* is origin country and *j* is destination country. There are quite a few studies that have used it in the fashion described here (Morley, 1997; Song, et al., 2003; Uysal & Crompton, 1984; Uysal & Crompton, 1985; Vanegas Sr, 2008). Kim and Uysal found that relative price is a significant factor for international tourism and affects demand negatively (Kim & Uysal, 1998).

Price is important demand variable and suggested that it be used in demand studies because of the importance assigned to this variable. This study will also use it as an independent variable.

Substitute Price

In economics, if one kind of goods is used (consumed) in a place of another, it is considered a substitute good, and changes in prices will change demand for the substitute good. Similarly, price changes in the tourism destination will likely affect competing tourist destinations. For a given destination country, one must be able to identify substitute destinations in order to able to calculate the substitute price. Each substitute destination's weight depends on tourist arrivals multiplied by adjusted Consumer Price Index and added for all substitute destinations.

$$SP = \sum_{j=1}^{n} \left({CPI_j}/{X_j} \right) * \left({TA_j}/{\sum_{j=1}^{n} TA_j} \right)$$

Where *SP* is substitute price, *CPI* is Consumer Price Index, *X* is Exchange Rate, *TA* is Tourist Arrivals, and *j* is substitute destination countries (Marcelpoil & Francois, 2009). When substitute countries are chosen they should offer similar climate, cultural and geography in order to be considered a substitute of the destination (Song, et al., 2003).

Exchange Rate

Exchange rate is the value of an origin country's currency in terms of the destination countries' currency. In a sense, it shows how much one country's money is worth in terms of other country's money. "If a currency devalues in a foreign country, international tourism becomes 'less expensive' and results in increased travel flows to that country. Conversely, an increase in the value of a country's currency will make international tourism 'more expensive' and cause decreased travel in that country" (Uysal 1998). Exchange rate is a major force for a stable long-run relationship between demand and explanatory variables when the cointegration method is used (Lathiras & Siriopoulos, 1998). This is an important indicator of tourism demand and is used in several ways (Algieri, 2006; Dritsakis, 2004; Eugenio-Martin, Martin-Morales, & Sinclair, 2008; Kulendran & Witt, 2003). However the argument for inclusion of exchange rates and relative prices as independent variables in the same model is that they both measure the same thing (Di Matteo & Di Matteo, 1993). The justification for this is that consumers are more aware of the exchange rate than the cost of living in the destination countries (Artus, 1970). Using only the exchange rate as a cost of living may be misleading due to the relatively high inflation which can eliminate the benefit observed (Witt & Witt, 1995). Especially if the consumer assumed little or no knowledge about the cost of living in the destination place than both variables should be used separately (Uysal & Roubi, 1999). Exchange rates have been found to be significant and elastic in several studies (Garin-Munoz & Amaral, 2000; Lee, Var, & Blaine, 1996).

Most studies suggest that tourists are more aware of this variable than anything else and thus, this study will use it as an independent variable.

Travel Cost

Travel cost is used to determine if distance or cost of travel affects demand. Travel cost is often used as air fare cost or surface cost (automobile driving distance, gas prices etc.). In some studies travel cost is used to substitute destinations. While studies have used travel cost (Martin

& Witt, 1987; Song & Wong, 2003; Witt & Martin, 1987), some studies find problems with travel cost data, such as the difficulty in obtaining the data, or multicollinearity between income and air fares (Uysal & Crompton, 1984). One important point to consider is the elasticity of air vs. automobile for international tourism and that this elasticity changes over time. In their study of *effects of expo 86 on US demand*, Holmes & Shamsuddin, (1997) found that air is luxury good (high income elasticity of 2.0) comparing to automobile (income inelastic of 0.9). Jensen, (1998) studied tourist arrivals to Denmark and used oil prices because the majority countries visiting Denmark were neighboring countries and they were using automobile to travel (adjusted with their CPI). Similarly Garín-Muñoz and Montero-Martín, (2007) used crude oil price as a travel cost indicator. In an earlier work Fuji & Mak, (1981) used real airfare to Honolulu. Kulendran, (1996) also used one-way economy airfare in terms of origin countries' currency (ABC World Airways Guide) from London to Sydney, Tokyo to Sydney, Auckland to Sydney, San Francisco to Sydney, and Tokyo to Honolulu, and is included in the demand models as the real cost of transport in the origin country's currency. Some studies used more elaborate form of this variable such as gasoline cost between origin and destination major cities, including the cost of ferry if needed, and cheapest air fare available on any day of the week and bookable in advance (Martin & Witt, 1988). Another problem with the calculation of this variable, especially in Turkey, is that most agencies use charter flights or buses directly to destinations. This kind of wholesale approach makes very hard to determine travel cost in the whole travel package. In addition there are other difficulties related to measuring travel cost such as variability in airfares between countries, different class and carriers, cost differences for earlier booking, chartered vs. scheduled travel and different entry and exit point to nations (Qiu & Zhang, 1995). According to Song, et al., (2003) "empirical studies, such as Martin and Witt (1987), Witt and Witt (1992) and

Kim and Song (1998), found that the variable of travel cost was insignificant in many of the tourism demand models. The reason for this is that the average economy airfare is not considered to be a good proxy for the travel cost variable" (p.439).

Population

Population is also used in different forms such as dividing GDP by population to find income or dividing tourist arrivals by population to see what percentage of the origin country visits the destination country. For example, calculating the PCI income of the country is generated by dividing GDP by its population. Once the resultant figure is adjusted with CPI, then, PCI would be expressed in real per capita income (Lathiras & Siriopoulos, 1998). Turner, et al., (1998) used population in their studies when they estimated demand from UK to seven major destinations over the period of 1978 to 1995.

Other Variables

Lagged Dependent Variables: Lagged dependent variables could be added to a model as an explanatory variable. One of the reasons is that, when people like a certain vacation destination they tend to return to the same place to eliminate uncertainty risk associated with other unknown vacation destinations. Furthermore, experiences of the visitors (positive or negative) shared with family members, friends, or strangers because of the current social media such as blog and twitter may be another reason for using lagged variables. This word of mouth effect plays a very important role in the future vacation destination selection (Song, et al., 2003).

And these previous effects are reflected in using lagged dependent variables as an independent variable in our models.

Unemployment: Unemployment is considered one of the leading indicators in economics. The International Labour Organization defines unemployment as a condition where people are without jobs and they have actively looked for a job within the past four weeks (ILO, October 1982). It is calculated that, a percentage value of the unemployed people of the total work force. Turner et al., (1997) used this to measure demand form USA, Japan, UK, and New Zealand to Australia. It is also used earlier by Wander & Van Erden (1980) to determine tourism demand to Puerto Rico.

Immigration: Qiu and Zhang, (1995) used immigration data as a positive influence made by the immigrants on their friends and families. Similar effects might be seen in the USA as the population includes immigrants from all over the world.

Crime Rate: Safety is very important in selecting destination places and violent offenses, including homicide, attempted murder, sexual assault, and robbery could be used to measure safety of the destination country. If international tourists have reliable information, regarding this kind of statistics it could be expected that crime rate would have a negative effect on tourism demand (Qiu & Zhang, 1995).

Gasoline and Oil Prices: Gasoline and oil prices are also a very important part of the travel cost variable, while some of the studies used fares between destinations some used oil or gasoline prices as a proxy like Di Matteo and Di Matteo, (1993) who used gasoline prices to determine tourism demand from Canada to USA.

Terrorism: While this variable has been used in demand for certain regions in the past, more and more regions affected by terrorism and related activities today. Drakos and Kutan, (2003) used terrorism and spillover effects on other countries in Mediterranean region where the effect of terrorism was used as a dummy variable.

Other variables also used that include age levels as an independent variable to measure age effect of American tourists to Ireland (Hanly & Wade, 2007), meteorological variables (Álvarez-Diaz & RossellÓ-Nadal, 2010), CPI adjusted tourism investment as a tourism supply and marketing expenditure to Tunisia (Choyakh, 2008), and marketing expenditures (Crouch, et al., 1992).

Given this large portfolio of dependent and independent variables, this study uses tourist arrivals as the dependent variable of the hypothesized demand model and ESI, relative price, exchange rate, and interest rate as the independent variables of the model. In addition, two dummy variables were also entertained in order to account for two events: 1) September 11, 2001 and Iraq War in 2003.

2.2. TIME SERIES DEMAND MODELS

This section first introduces the essentials of time series and problems related to earlier models in demand forecasting. Later, the section focuses on newer econometric models that are considered in this particular study.

2.2.1. INTRODUCTION

A basic model for time series is:

$$y_t = \beta x_t + \epsilon_t \text{ Where } t=1, 2, 3\ldots., \text{T}$$

Where y_t= is dependent variable at time t, x_t is independent variable at time t and β is coefficient of explanatory variable, and ϵ_t is error term. A time series is basically a set of observations x_t, each one being recorded at a specific time t (Jurdana, 2009). The study focuses on discrete-time series where t=1, 2, 3…., T is observed in a set of intervals such as annually, quarterly, and monthly. As in any other analyses, the time series analysis assumes that there are two components in time series. The first one is the identifiable part and other one is the error term. The idea behind the most time series models involves some type of method to eliminate or understand the error coefficient. There are two main components used to describe the time series, namely, trend and seasonality. Seasonality repeats itself overtime, for example, Mediterranean tourist arrivals increase in the summer and decrease in the winter time. This trend could have a linear or a non-linear form and changes over time, and may not repeat in the time range used. Take for example, the growth rate in tourist arrivals over the last 20 years to Turkey. Most of the statistics used in the financial observation of countries are time series such as GDP and CPI.

Similarly, tourist arrivals are usually found in monthly, quarterly, and annual data. Identifying the patterns in the time series data and testing the impact of independent variables over time has been goal in many research applications. Most researchers also use time series to forecast future patterns of demand using different variables and models.

One of the most important things to consider in time series analysis is the serial (auto) correlation. Therefore, this section will focus on the detection (Durbin-Watson, Breusch Godfrey/Lagrange Multiplier) and the solution (Cochrane Orcutt, Prais Winsten) for the serial correlation problem. While many of the earlier models have used these solutions, those models assume stationary time series in the data. Using OLS (Ordinary Least Squares) regression without testing the stationarity of the series, has led to spurious results with high value R^2 and smaller DW (Choyakh, 2008). After focusing on the stationarity and testing method(s) for non stationarity (Unit root test), this study will introduce the most commonly used econometric models for time series in the tourism demand analysis.

2.2.2. EARLIER MODELS

2.2.2.1. AUTO CORRELATION / SERIAL CORRELATION

Autocorrelation happens when there is a correlation between errors of the different observations of the time series. We can say that ε_t is not independent of

ε_{t-s} Where E $[\varepsilon_t, \varepsilon_{t-s}] \neq 0$ (t > s) disturbance occurring at time t is related to the disturbance occurring at time $(t - s)$. There are authors who separate and put different meanings to serial correlation and autocorrelation for different reasons, where autocorrelation refers to correlation between the disturbance for the same series and serial correlation used for two different time series. This study follows most common practice and uses them interchangeably.

An important question is why autocorrelation is important to us? This is because if there is an autocorrelation in our data, our Ordinary Least Square (OLS) regression result will give correct estimates but the standard errors will be either deflated or inflated. In turn, this will change the significance of the relationship as such that it may show a non-significant relationship as significant or show no significant relationship at all. This violates the assumption that the error term of one observation must be uncorrelated with the error term of other observations:

$$E\,[\varepsilon_t, \varepsilon_{t-s}] \neq 0 \;(t > s).$$

Next section focuses on how to detect the serial correlation, while there are more than few methods the following will show two most commonly used methods, Durbin-Watson and Breusch Godfrey.

2.2.2.2. DURBIN WATSON

Durbin and Watson (DW) introduced their methods to test serial correlation for least square regression in 1951 (Cracolici & Nijkamp, 2009). Several assumptions need to be followed in order to use DW test. Error process in the model is AR1 (First Order Auto Regressive), Error term is normally distributed, no lagged dependent variable used, and no missing variable in the data. The hypothesis for DW is:

$$H_0 = \rho = 0$$

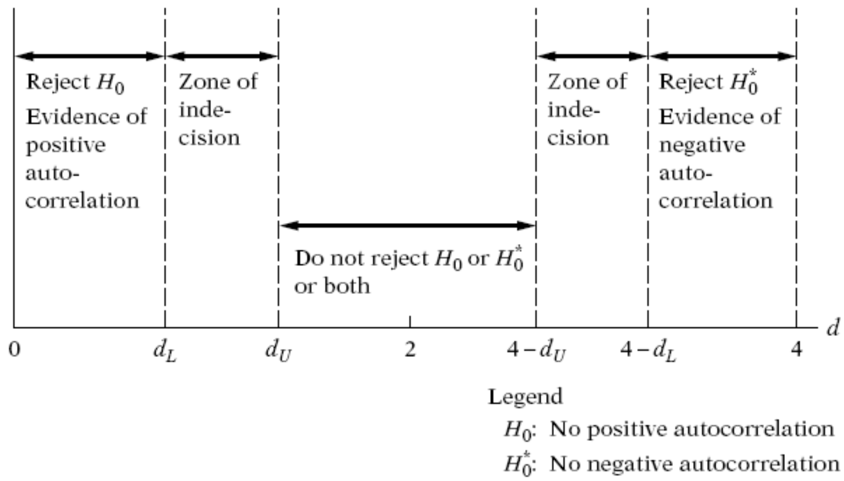
$$H_A = \rho > 0$$

And test statistic is:

$$d = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2}$$

Where e_t is the error term and calculated by observed value subtracted from the predicted value at the time t. Result of the calculation is d ≈ 2 (1- ρ). If ρ=0 than there is no serial correlation and d=2. If ρ=1 that is perfect positive serial correlation and d ≈ 0. If ρ= -1 that is perfect negative serial correlation and d =4. From the calculations, Durbin and Watson derived lower dL and upper bound dU values and created a table.

If d < dL	reject $H_0 = \rho = 0$
If d > dU	do not reject $H_0 = \rho = 0$
If dL < d < dU	test is inconclusive.



(Gujarati, 2003)

2.2.2.3. BREUSCH GODFREY / LAGRANGE MULTIPLIER (LM)

Another method used to test the serial correlation is Breusch Godfrey or Lagrange Multiplier LM). The main difference between DW and this one is that this particular one allows use of lagged dependent variables and not limited with the first order Autoregressive process. Let assume our model is as follows:

$$y_t = \beta_0 + \beta_1 x_t + e_t$$

And error term e_t follows kth order autoregressive, AR(k) is then

$$e_t = \rho_1 e_{t-1} + \rho_2 e_{t-2} + \rho_3 e_{t-3} + \cdots + \rho_k e_{t-k} + u_t$$

Where u_t is a white noise error term. And the null hypothesis is:

$$H_0 = \rho_1 = \rho_2 = \cdots = \rho_k = 0$$

Which means there is no serial correlation of any order. When the sample size is large, R^2 will be $(n-k)R^2 \sim \chi_k^2$ where $(n-k)R^2$ exceeds χ_k^2 at the significance level, we reject the null hypothesis of no serial correlation. “The Lagrange multiplier test for serial correlation (LM) shows that the null hypothesis of no serial correlation is not rejected, and hence serial correlation is deemed to be absent in the residuals” (Algieri, 2006). Major problem with the Breusch Godfrey test is which lags to be chosen cannot be predetermined.

2.2.2.4. GENERALIZED LEAST SQAURES

Let assume to have AR(1) and where ρ is known.

$$y_t = \beta_1 + \beta_2 x_{2t} + \cdots + \beta_k x_{kt} + e_t$$

$$e_t = \rho e_{t-1} + v_t \quad E(v_t) = 0 \quad E(v_t^2) = \sigma_v^2$$

Then lagging the equation and multiplying it by ρ creates

$$\rho y_{t-1} = \beta_1 \rho + \beta_2 \rho x_{2t-1} + \cdots + \beta_k \rho x_{kt-1} + \rho e_{t-1}$$

Subtracting this from the first equation, the following model is generated:

$$y_t - \rho y_{t-1} = \beta_1 - \beta_1\rho + \beta_2(x_{2t} - \rho x_{2t-1}) + \cdots + \beta_k(x_{kt} - \rho x_{kt-1}) + e_t\text{-}\ \rho e_{t-1}$$

But e_t- $\rho e_{t-1} = v_t$ which is usable for OLS analysis. The following section explains two GLS applications, namely Cochrane Orcutt and the Prais Winsten methods. Both use similar approach. Cochrane Orcutt method uses a lag and loses the first observation, Prais Winsten preserves the first observation.

2.2.2.4.1. COCHRANE ORCUTT

After the estimating the model with OLS, residuals are regressed on the lagged residuals:

$$e_t = e_{t-1} + v_t$$

The coefficient on the lagged residual is estimated ρ value. Using ρ that can generate

$$y_t^* = y_t - \rho y_{t-1}\ and\ x_t^* = x_t - \rho x_{t-1}$$

This process loses first observation because of this process we regress y_t^* on x_t^*. We regress new residuals on lags' new residuals to get new ρ. We repeat this process until we get convergence.

2.2.2.4.2. PRAIS WINSTEN

As explained earlier, the difference between Cochran Orcutt and Prais Winsten is in Prais Winsten we don't lose first observation. Following transformation achieves that

$$y_0 = y_0\left(\sqrt{1-\rho^2}\right)\ and\ x_0 = x_0\left(\sqrt{1-\rho^2}\right)$$

Earlier models used to analyze tourism demand have solved the serial correlation problem by Cochran Orcutt and Prais Winston methods. However, these methods may cause "technical violations" in Ordinary Least Square analysis. When there are no lagged dependent variables used and there is a serial correlation, GLS solves the problem. But over time these models fell out of favor because they just provide corrected standard errors and ignore the dynamic structure of the data and stationarity.

2.2.3. STATIONARITY

As stated, earlier models have employed standard OLS methods, which resulted in a common problem from the inconsistent estimations and unreliable test statistics related to the stationarity problem. This problem results in spurious regression, when using biased results and accepting the wrongly drawn conclusions from the data. To eliminate this problem, we should test for non-stationary time series (Wong, 1997).

One of the assumptions for the regression is that mean, variance, and covariance of the data are constant. “A stationary time series will have a mean and variance that do not change through time. The covariance between values of the process at two time points will depend only on the distance between these time points and not on time itself. If a series is non-stationary, then its mean, variance and covariance may be changing so that regression models which assume these are all constant may be misleading” (Kulendran, 1996, p.204). So when we measure statistical values at time t for our series that won’t be different than the measurement at the time t'.

Mean stationary time means that expected value of the process is constant over time

$$E[Y_t] = \mu \; \forall \; t$$

Similarly stationary variance means

$$var[Y_t] = E[(Y_t - \mu)^2] = \sigma_Y^2 \forall \; t$$

And stationarity covariance is

$$cov\;[Y_t, Y_{t-s}] = E[(Y_t - \mu)(Y_{t-s} - \mu)] = \gamma_s \forall \; s$$

When we differentiate the series once it is said to be integrated order of 1. So if series is stationarity without differencing is I(0) and series differentiated x times to be integrated order of x and denoted I(x) where:

$$Y_t = \beta + Y_{t-1} + \varepsilon_t \rightarrow I(1)$$

$$\Delta Y_t = Y_t - Y_{t-1} = \beta + \varepsilon_t \rightarrow I(0)$$

"This is because nonstationarity in the data will produce inconsistent parameter estimators as well as unreliable test statistics since the variance of the underlying time series is unbounded (not finite) and increases as time passes. In the case of a stationary process, a shock to the time series will only have a *temporary memory effect* in which the time series will quickly return to its previous level as time increases. That is, the time series has the tendency to revert back to its mean or what is often referred to as mean-reverting. This behavior is in direct contrast to a non-stationary process where the effect of a shock on the time series does not disappear and uncertainty about its level extends indefinitely. In other words, the shock has a *permanent memory effect* and the level of the time series will be permanently raised by the shock. This main difference in the behavior of these two broad classes of time series property can often be observed from a visual inspection. However, since graphical analysis in itself cannot lead to the confirmation of the type and actual form of behavior, formal test procedures are required to determine their time series properties "(Wong, 1997 p.186). Most common method used to determine if time series stationary or nonstationary is Unit Root Test.

2.2.4. UNIT ROOT TEST

The nature of t time series and the problems related to nonstationarity and spurious regression require us to check unit roots of given data (Hanly & Wade, 2007). "The implementation of further stationarity tests, including the Dickey–Fuller unit root test, the Phillips– Perron test and the Dickey–Fuller generalized least squares test, revealed that the resultant first differenced variables were deemed stationary at relevant degrees of confidence " (Hanly & Wade, 2007). Unit root test is extremely important to financial time series because most of them contain unit roots. The most common tests used are Augmented Dickey Fuller Test (Dickey & Fuller, 1979) and Phillips – Perron Test (Phillips & Perron, 1988). There are many studies that used unit root test (Alleyne, 2006; Dougan, 2007; Gustavsson & Nordstrom, 2001; Narayan, 2003).

Dickey Fuller (DF) Unit Root Test could be used for any type of time series data. DF unit root test is based on following:

$$\Delta Y_t = \gamma Y_{t-1} + u_t$$

Which means change in Y_t is equal to certain value of the previous period plus the error term. It could be added the constant and trend the equation:

$$\Delta Y_t = \alpha + \beta T + \gamma Y_{t-1} + u_t$$

Hypothesis for the result is

$H_0: \gamma = 0$ Unit Root

$H_1: \gamma \neq 0$

According to Wong (1997) Augmented Dickey Fuller test is one of the most commonly used test and it tests the null hypothesis of a unit root against a stationary alternative. The test is based on OLS (Ordinary Least Squares) regression and is written as

$$\Delta Y_t = \alpha + \rho Y_{t-1} + \sum_{i=1}^{k} \varphi \, \Delta Y_{t-i} + \varepsilon_t \quad \text{(Wong, 1997)}$$

2.2.5. NEW ECONOMETRIC MODELS

2.2.5.1. ARDL (Auto Regressive Distributed Lag)

In economics, the effects of certain investments should linger over time. When a new machine installed in a factory, the benefits from it might become evident only after certain period of time. In other words, whenever there is time involved with the decision, one should not only look into current factors, because the decision/result is affected by past factors as well as current factors. There are several reasons related to this such as psychological habits and effects, technological and technical delays, and mainly related to income theory of consumption (theory indicates that when there is an income change it might take some time for a consumer to decide if change in real disposable income was temporary or permanent).

When modeling is done for autocorrelation, in Cochran-Orcutt and Prais-Winsten models, researcher can solve the problem but may ignore the dynamic structure in the data. The tourism decision process is like any other decision process is affected by current and past factors. As the Song et al., (2003) stated “current tourism demand variable to the current values of the influencing factors, and does not consider the dynamic feature of tourists' decision process. We know that tourism demand is a dynamic process, as tourists make decisions about destination choice with time leads. Therefore, the model used for analyzing and forecasting tourism demand should reflect this feature" (p.440).

Autoregressive Distributed Lag (ARDL) is introduced earlier into econometric world to use for lagged economic variables. In its simplest form ADL (1, 1) is defined as:

$$y_t = \beta_1 x_t + \beta_2 y_{t-1} + \beta_3 x_{t-1} + \varepsilon_t$$

This form is later used in tourism demand studies by Song and Witt and took the form

$$lnQ_{it} = \alpha_0 + \alpha_1 lnQ_{it-1} + \alpha_2 lnP_{it} + \alpha_3 lnP_{it-1} + \alpha_4 lnY_{it} + \alpha_5 lnY_{it-1} + \alpha_6 lnP_{st} + \alpha_7 lnP_{st-1} + \varepsilon_{it}$$

(Haiyan Song, et al., 2003)

How the lags are introduced depends on the data used and the period of data (i.e. monthly, quarterly etc.). There are many studies that utilized ARDL method in tourism (Halicioglu, 2005; Ketenci, 2010; Mervar & Payne, 2007; Narayan, 2004).

2.2.5.2. VAR (Vector Autoregressive)

VAR is an extension of univariate autoregression model and is used to describe dynamic behavior of macroeconomic time series. The earlier popularity of the simultaneous equations approach started to crumble because of the restrictions imposed over the models. Sims (1980) criticized this kind of approach because ad hoc restrictions are needed for identification and for the ad hoc classification of exogenous and endogenous variables in the system (cited in (Baltagi, 2008). It is suggested "that it would be better to use models that do not depend on the imposition of incorrect prior information" (Song, et al., 2008, p. 91). In this model, VAR assumes all the variables as endogenous variables, but VAR can still include the exogenous variables such as trend, dummy variables, seasonality etc.

Next question we should ask is why it is important to use endogenous variables for economic time series? Lest look into a simple single market economic model such as supply-demand model. In a single market supply and demand functions together to determine the equilibrium point which means supply and demand depend on each other. Similarly in any given market everything in the market is affected, and this depends on everything else implies endogenous variables.

While there are non-stationary VAR models, using VAR technique with multivariate cointegration analysis such as Johansen cointegration model (Song, et al., 2008) became popular over the years (i.e. (Algieri, 2006)). Basic of VAR analysis could be written as:

"General VAR specifications starts with two AR(1) processes

$$y_{1t} = \pi_{11} y_{1t-1} + e_{1t}; \qquad e_{1t} \sim IID\ (0, \sigma_{11})$$

$$y_{2t} = \pi_{22} y_{2t-1} + e_{2t}; \qquad e_{2t} \sim IID\ (0, \sigma_{22})$$

Turning into Vector format gives us

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} \pi_{11} & 0 \\ 0 & \pi_{22} \end{bmatrix} \begin{bmatrix} y_{1t-1} \\ y_{2t-1} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix}$$

Or in a matrix form

$$Y_t = \Pi_1 Y_{t-1} + \mathrm{E}_t; \qquad \mathrm{E}_t \sim IID\ (0, \Sigma)$$

If no restriction imposed on the matrix unrestricted VAR model of order 1 could be obtained, or VAR(1) which represents the following equations:

$$y_{1t} = \pi_{11} y_{1t-1} + \pi_{12} y_{2t-1} + e_{1t}; \qquad e_{1t} \sim IID\ (0, \sigma_{11})$$
$$y_{2t} = \pi_{21} y_{1t-1} + \pi_{22} y_{2t-1} + e_{2t}; \qquad e_{2t} \sim IID\ (0, \sigma_{22})$$

Similarly unrestricted VAR could be generalized to VAR (p) model:

$Y_t = \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \cdots + \Pi_p Y_{t-p} + \mathrm{E}_t; \qquad \mathrm{E}_t \sim IID\ (0, \Sigma)$" (Song & Witt, 2000 p.106)

2.2.5.3. ARCH/GARCH (Autoregressive Conditional Heteroskedasticity)

When using certain regression techniques such as OLS (Ordinary Least Squares) one of the important assumptions made is that the error term has a constant variance. This may not be true for financial time series such as CPI or Exchange rates. When the time series observed, it is often found that variation for the time series changes apparently without any reason. For example CPI or Exchange rates might change due to Federal Reserve policies. This suggests that variance of the time series could be heteroskedastic and it would be important to include this variation changes into our model.

For example, when there is a random variable Y_t givenX_t, the Y_t is heteroskedastic if conditional variance of Y_t givenX_t changes over time t. While possibility of Heteroskedasticity in cross-sectional data and the autocorrelation in time series was known, Engle (1982) found that Heteroskedasticity could be a problem in time series as well. Heteroskedasticity does not affect coefficient estimates of OLS but creates problem of the estimates of variance. This means that the regression analysis will still provide an unbiased estimate between dependent and independent variable, but standard errors therefore inferences will be biased, so the result of the relevant hypothesis will be wrong. GARCH is an extension of ARCH, according to Bollerslev (1986) “While conventional time series and econometric models operate under an assumption of constant variance, ARCH (Autoregressive Conditional Heteroskedastic) process introduced in Engle (1982) allows the conditional variance to change over time as a function of past errors leaving the unconditional variance constant. The extension of the ARCH process to the GARCH process bears much resemblance to the extension of the standard time series AR process to the general ARMA process and, as is argued that permits a more parsimonious description in many situations” (p. 307) .

2.2.5.4. Cointegration and ECM (Error Correction Model)

The concept of cointegration introduced by Engle and Granger, (1987) and has been suggested as a solution to "spurious regression" problem. According to Engle and Granger (1987) "If each element of a vector of time series x_t, first achieves stationarity after differencing, but a linear combination $\alpha' x_t$, is already stationary, the time series x_t, are said to be co-integrated with co-integrating vector α ." (p.275)

What does it mean in practical terms? Murray, (1994) explained this with good analogy in his article titled "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction." A drunken person walks in a pattern similar to random walk path. Similarly, a dog also walks in a random pattern, each time dog got new scent it changes direction. Let say we know the location of drunk, probably that doesn't say anything to us about the dog's location. And assuming they both left the bar at the same time, there is a likely chance that they will be separated from each other. This growing variance of location between them characterized the non-stationarity. If dog belongs to drunk and she calls out the dog certain times and correct her path to direction of dog's calling, now they don't have a random walk between them and we added what is called error correction mechanism. When the drunk get out of the bar with dog and if there is an error correction such as calling the dog or adjustable leash between them, for an outsider it might look like that they are still wondering around aimlessly but if you know the location of the dog or drunk they won't be far from each other. Then we can say that their path is non-stationary but distance between two paths is stationarity. And drunk and her dog said to be cointegrated.

Most of the tourism demand models use economic time series and existence of common (stochastic) trends in the series made this model quite useful. One of the earlier uses of cointegration was about Australia's tourist flows from four originating countries (Kulendran, 1996). Error Correction Models were used to study short run dynamics in tourism demand such as Tunisian hotel arrivals from origin countries between 1962-2005 using macroeconomic variables such as income, and relative prices (Choyakh, 2008). Dougan (2007) also used Japanese arrivals to Guam to determine short and long term elasticities of price and income. There are many studies that used the cointegration and error correction model (Algieri, 2006; Daniel & Ramos, 2002; Dritsakis, 2004; Ouerfelli, 2008; Vogt & Wittayakorn, 1998).

CHAPTER THREE: METHODOLOGY

3. INTRODUCTION

This chapter focuses on the model generation for use in this study, operationalization and justifications of the selected variables for inclusion in the developed model.

The demand function for the Origin country *i* to Destination country *j* is given by:

$$ARRV_{ij} = f(ESI_i, IR_i, RP_{ij}, EX_{ij})$$

Where

$ARRV_{ij}$ =Visitor arrivals from Origin country *i* to Destination country *j* at given time

ESI_i = Economic Sentiment Indicator for the origin country *i*

IR_i = Interest Rate in the Origin Country *i*

RP_{ij} = Relative Price for tourists from origin country *i* to destination country *j*

EX_{ij} = Exchange Rate for tourists from origin country *i* to destination country *j*

The simplest relationship of tourism demand is the linear relationship which is given by the following additive model:

$$ARRV_{ij} = \alpha + ESI_i^{\beta 1} + IR_i^{\beta 2} + RP_{ij}^{\beta 3} + EX_{ij}^{\beta 4} + \varepsilon_{ij}$$

Where, α, βs' are coefficients that will be estimated empirically and ε_{ij} is the error term. Empirical studies show that many of the tourism demand relationship between dependent and independent variables can be approximately represented by the linear relationship over the sample period under the consideration (Smeral et al., 1992).

A measure of sensitiveness is also calculated for demand, called elasticity. We can get demand elasticity from the linear function for each given independent variable. For example demand elasticity for ESI is calculated by:

$$\epsilon_{ESI} = \frac{\Delta ARRV_{ij} / ARRV_{ij}}{\Delta ESI_i / ESI_i} = \frac{\Delta ARRV_{ij}}{\Delta ESI_i} * \frac{ESI_i}{ARRV_{ij}}$$

Where $\Delta ARRV_{ij}$ is change in tourist arrivals and, ΔESI_i is change in Economic Sentiment Indicator. This result shows the percentage change in tourist arrivals, attributable to a given percentage change in an independent variable such as ESI, which is called ARC Elasticity (Song, et al., 2008). At the limit where $\Delta ARRV_{ij}$ and ΔESI_i are very small we can obtain the point elasticity:

$$\epsilon_{ESI} = \frac{\partial ARRV_{ij}}{\partial ESI_i} * \frac{ESI_i}{ARRV_{ij}} = \frac{\partial(\alpha + ESI_i^{\beta 1} + IR_i^{\beta 2} + RP_{ij}^{\beta 3} + RX_{ij}^{\beta 4} + \varepsilon_{ij})}{\partial ESI_i} * \frac{ESI_i}{ARRV_{ij}}$$

$$= \alpha \frac{ESI_i}{ARRV_{ij}}$$

We are using partial derivative to get the effect of ESI on tourist arrivals by holding others constant. As we can see from the result the point elasticity is obtained from the expressed linear relationship by finding the α value and multiplying it with $ESI_i/ARRV_{ij}$. But because of $ESI_i/ARRV_{ij}$ variation over time our demand elasticity will also vary over time.

3.1.POWER MODEL AND ELASTICITY

The study will use econometric approach of power model (Cobb & Douglas, 1928) to analyze demand for tourism to Turkey from the European countries.

Power Model is:

$$ARRV_{ij} = A\ ESI_i^{\alpha}\ IR_i^{\beta}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij}$$

Power model implies that the marginal effects of each independent variable on tourism demand are not constant but depend on the value of the variable as well as on the other variable values (Song, et al., 2008). Similar to linear relationship A, α, β, γ, δ are coefficients that will be estimated empirically and ε_{ij} is the error term. For example if we want to know how the change in IR affects the ARRV than we need to take partial derivative of the model

$$\frac{\partial ARRV_{ij}}{\partial IR_i} = \beta A\ ESI_i^{\alpha}\ IR_i^{\beta-1}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij}$$

This shows that change on the interest rate affects tourist arrivals but this also depends on the other variables in the model. There are a couple of other features that make power model more valuable; first, the way it is, we cannot use regression models to estimate the model but using log form turns power model into linear relationship. Witt and Witt (1995) found that in tourism demand studies 75% of the models used double log functional forms. When model turns into the double log form, it could be easier to interpret the results. All the coefficients from the model are simply demand elasticities. Secondly, the estimation of elasticity becomes easier like the following example:

The elasticity of ESI is calculated as follows

$$\epsilon_{ESI} = \frac{\partial ARRV_{ij}}{\partial ESI_i} * \frac{ESI_i}{ARRV_{ij}}$$

The calculation for the elasticity of ESI for the power model is:

$$\epsilon_{ESI} = \frac{\partial ARRV_{ij}}{\partial ESI_i} * \frac{ESI_i}{ARRV_{ij}}$$

from the earlier calculation

$$\frac{\partial ARRV_{ij}}{\partial ESI_i} = \alpha A \, ESI_i^{\alpha-1} \, IR_i^{\beta} \, RP_{ij}^{\gamma} \, EX_{ij}^{\delta} \, \varepsilon_{ij}$$

$$\text{And } ARRV_{ij} = A\ ESI_i^{\alpha}\ IR_i^{\beta}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij}$$

So it can be written as

$$\alpha A\ ESI_i^{\alpha-1}\ IR_i^{\beta}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij} * \frac{ESI_i}{A\ ESI_i^{\alpha}\ IR_i^{\beta}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij}}$$

and

$$ESI_i^{\alpha-1} = \frac{ESI_i^{\alpha}}{ESI_i}$$

$$\frac{\alpha A\ ESI_i^{\alpha}\ IR_i^{\beta}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij}}{ESI_i} * \frac{ESI_i}{A\ ESI_i^{\alpha}\ IR_i^{\beta}\ RP_{ij}^{\gamma}\ EX_{ij}^{\delta}\ \varepsilon_{ij}} = \alpha$$

Elasticity of ESI is essentially the same as the coefficient of the ESI variable. This result is same for all the other variables. Constant Demand Elasticity obtained from the Cobb-Douglas is important for policy makers because it allows them asses percentage impact on tourism demand resulting from 1 percentage change in variable while holding others constant (Song, et al., 2008).

3.2.VARIABLES and DATA

This section will explain the variables that were employed in this study. Earlier sections already provided justified for use of some of the variables in the model. Sources of the data are also included in the section.

3.2.1. ARRV (Tourist Arrivals)

Tourist arrivals from Origin country *i* to Destination country *j*. For this particular study monthly statistics (2001-2007) from European Union countries to Turkey data collected from the Turkish Ministry of Tourism web pages (Turkish Statistical Institute, 2010). There are two main reasons why the study used EU arrivals to Turkey. First one is availability of the data. Secondly, Turkey's key market for tourism exports is Europe (Halicioglu, 2005). Between 2000 and 2009, 49% to 60% of the total arrivals came from EU countries. Since 1964, Ministry of Tourism and the Ministry of Interior has been compiling entry and exit statistics. (See Appendix for Tourist Arrival vs. ESI Charts).

There are many studies that have used Tourist Arrivals as a dependent variable. Crouch, et al. (1992) used the tourist arrivals data to determine demand to Australia. Hailin and Yin-sik (2006) also used arrivals from Canada with other economic variables. Icoz, et al., (1998) utilized arrivals to determine tourism demand while using supply side as an independent variable. There are many more studies that used tourist arrivals as stated earlier in the dependent variables section.

3.2.2. ESI (Economic Sentiment Indicator)

Economic Sentiment Indicator currently surveys 125,000 firms and 40,000 consumers every month across EU. There are 5 different types of surveys collected from Industry, Construction, Retail Trade, Services and Consumers. Each survey creates confidence indicators;

Economic Sentiment Indicator is made up of 15 individual components of those confidence indicators. Weights of the sectors are as follows:

Industry	40 Percent
Services	30 Percent
Consumers	20 Percent
Construction	5 Percent
Retail Trade	5 Percent

Above weights are not directly applied to the five confidence indicator but to their standardized individual component series. Monthly statistical data for Economic Sentiment Indicator obtained from Eurostat web pages (Eurostat, 2007). Eurostat is the office responsible for providing statistics for European Communities (See Appendix for Tourist Arrival vs. ESI Charts).

3.2.3. IR (Interest Rate)

Interest rate is the rate that which is paid by borrower to lender for the use of borrowed money, in a sense, interest rate is the cost of the money used. Interest rate data collected from OECD statistical databases on a monthly short term rate for all the given countries.

3.2.4. RP (Relative Price)

Determining the cost of living in the destination country is hard. Some uses CPI (Consumer Pricing Index) for the living cost, some others use the exchange rate because tourists know more about exchange rate than CPI. While CPI is not considered a reasonable measure for tourism price because of the convenience and its potency to show average consumer spending patterns it will serve as a c lose proxy for tourism prices (Morley, 1994). Relative Price in a sense uses CPI's of countries and adjusts it with the exchange rates of countries. Calculation is as follows:

$$RP_{ij} = \frac{CPI_j / X_j}{CPI_i / X_i}$$

Where RP_{ij} is Relative Price in origin *i* for destination *j*, *CPI* is Consumer Price Index, *X* is Exchange Rate, *i* is origin country and *j* is destination country.

3.2.5. EX (Exchange Rate)

Exchange rate is the value of origin countries' currency in terms of the destination country's currency. In a sense it shows how much of one country's money worth in relation to that of other country's money. "If a currency devalues in a foreign country, international tourism becomes 'less expensive' and results in increased travel flows to that country. Conversely, an increase in the value of a country's currency will make international tourism 'more expensive' and cause decreased travel in that country" (Uysal1998). It is an important indicator of tourism demand and is used in several ways (Algieri, 2006; Eugenio-Martin, et al., 2008; Kulendran & Witt, 2003). Monthly Exchange Rate data are gathered from the OECD databases.

Lately tourism demand studies have started to explore dynamic part of the analysis and focused on the cointegration methods. Tourism field is replete with such studies that used cointegration methods (Dritsakis, 2004; Kim & Song, 1998; Kulendran & Witt, 2001; Lathiras & Siriopoulos, 1998; Lim & McAleer, 2002; Mervar & Payne, 2007; P. Narayan, 2004; P. Narayan, 2003; Ouerfelli, 2008; Webber, 2001).

There are several approaches to the cointegration method, most common ones are Engle and Granger Cointegration (Engle & Granger, 1987) , multivariate approach made by Johansen and Juselius (Johansen, 1988; Johansen & Juselius, 1990), and the ARDL Bound test approach based on Unrestricted Error Correction Model developed by Pesaran (M. Pesaran & Shin, 1995; M. H. Pesaran, Shin, & Smith, 1996, 2001).

3.3.ARDL Bound Test Approach

For this study, the ARD bound test approach is employed for the following reasons. First, most of the cointegration methods require large sample size to be valid and perform poorly in the case of small sample sizes. On the other hand, the ARDL approach performs well with small sample sizes compare to other cointegration methods. For example, this study employs 84 monthly data points and the ARDL bound test approach is best fit for this kind of small sample size. Second, this approach can estimate long and short run relationships of the model simultaneously, furthermore the approach can distinguish between the dependent variable and explanatory variables when cointegration relation exists (Narayan, 2004). Third, pre-testing requirement for the unit root for cointegration methods is eliminated, which in turn eliminates the problems created by the very low power of the unit root test. Fourth, most importantly the ARDL bound test approach applicable to testing the existence of the relationship whether the regressors in the model are integrated order of I(1) , integrated order of I(0) or fractionally cointegrated. Conventional cointegration methods require all variables to be integrated order of I(1) and according to (M. H. Pesaran, et al., 2001) “This inevitably involves a certain degree of pre-testing, thus introducing a further degree of uncertainty into the analysis of levels relationships” (p.289). However one important point should be mentioned, while the ARDL approach works well with I(0) or I(1), in the presence of any integrated order higher than 1 will crush this method.

Procedure is simple, once the optimum lag order has been identified and the presence of the cointegration relationship established it can be estimated using OLS (Ordinary Least Square) regression method. Similarly a dynamic approach to ECM (Error Correction Model) can be derived from the result via simple linear transformation (Banerjee, Lumsdaine, & Stock, 1992). For all the reasons mentioned before, this study employs the ARDL bound test approach to examining long and short run relationships between tourist arrivals and selected independent variables.

ARDL representation of the demand for Turkey can be written as follows:

$$\Delta \text{LnSTA}_t = c_0 + \sum_{i=1}^{n} \alpha_i \Delta \text{LnSTA}_{t-i} + \sum_{i=0}^{n} \beta_i \Delta \text{LnESI}_{t-i} + \sum_{i=0}^{n} \gamma_i \Delta \text{LnINT}_{t-i} + \sum_{i=0}^{n} \delta_i \Delta \text{LNRP}_{t-i} + \sum_{i=0}^{n} \theta_i \Delta \text{LnEX}_{t-i} + \lambda_1 LnSTA_{t-1} + \lambda_2 LnESI_{t-1} + \lambda_3 LnINT_{t-1} + \lambda_4 LnPR_{t-1} + \lambda_5 LnEX_{t-1} + \epsilon_t$$

Where Δ is the first difference operator, $\alpha_i, \beta_i, \gamma_i, \delta_i, and\ \theta_i$ represent short run dynamics of the model, $\lambda_1, \lambda_2, \lambda_3, \lambda_4, and \lambda_5$ represent long run elasticities, n is the optimum lag length and ϵ_t is the error term.

ARDL Bound test approach involves two steps to test relationship of the variables in the model. First step is to examine whether there is a cointegration among dependent and independent variables. Using F-test or Wald coefficient restriction test, the null hypothesis of "no cointegration"

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$$

are tested against the alternative hypothesis of "cointegration"

$$H_a: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0$$

for each country. This can also be denoted as:

$$F_{LnSTA}(LnSTA | LnESI, LnINT, LnPR, LnEX)$$

Pesaran et al. (2001) reported two sets of critical values using Monte Carlo simulation for different significance levels and different scenarios (whether model contains trend and/or intercept). If the computed F-statistic value is smaller than the lower bound I(0) Critical Value, then the null hypothesis of "no cointegration" cannot be rejected. Similarly if computed F-statistics is higher than upper bound I(1) Critical Value, the null hypothesis of "no cointegration" rejected. If computed F-statistics falls in between lower and upper bound, then the result become inconclusive. When result is inconclusive error correction term could be used to establish cointegration. After confirming that there is a cointegration in the model, second step is used to estimate long run and short run coefficients of the same equation simultaneously. Optimal lag selection on ARDL model can be derived using critical values such as Akaike Information Criterion (AIC), or Schwartz Bayesian Information Criterion (SBIC). However Pesaran and Shin (1999) recommend using SBIC instead of AIC due to difference in lag selection method. After the long run ARDL model estimated with optimal lag selection the short run dynamic parameters could be obtained. The general ECM (Error Correction Model) version of the equation is given as follows:

$$\Delta \text{LnSTA}_t = c_0 + \sum_{i=1}^{n} \alpha_i \Delta \text{LnSTA}_{t-i} + \sum_{i=0}^{n} \beta_i \Delta \text{LnESI}_{t-i} + \sum_{i=0}^{n} \gamma_i \Delta \text{LnINT}_{t-i} + \sum_{i=0}^{n} \delta_i \Delta \text{LNRP}_{t-i} + \sum_{i=0}^{n} \theta_i \Delta \text{LnEX}_{t-i} + \xi ECM_{t-1} + \varepsilon_t$$

Where $\alpha_i, \beta_i, \gamma_i, \delta_i, and\ \theta_i$ represent short run dynamics of the model, ECM represent the Error Correction term derived from the long run relationship, and ξ is the speed of adjustment parameter.

CHAPTER FOUR: DATA ANALYSIS and EMPIRICAL RESULTS

4. Introduction

As it was stated earlier, the Bound test approach does not require variables to be tested for non-stationarity. At the same time, this approach without non-stationarity test will have a problem with estimates if there is any variable that is higher than integrated order of 1 I(1). The unit root tests are calculated to be sure that all the variables are I(1) or lower. ADF (Augmented Dickey Fuller) and (P-P) Phillips Peron are the most commonly used tests for the non-stationarity. Detailed Results of both ADF and P-P unit root tests, the estimated long and short term coefficients with their associated tests, including the various diagnostic tests results such as LM serial correlation, Ramsey's reset test, LM normality and LM heteroscedasticity, and CUSUM and CUSUMSQ graphs are presented under each country.

At the outset the study generated Pearson correlations between the variables included in the model. The analysis indicated that most of the country-specific variable correlations were below .70. Thus, since the study utilizes time-series data, it is assumed that there is not a major concern about the problem of multicollinearity among the variables.

The following section provides study findings for each of the selected 15 countries separately. This is done for the sake of simplicity in reporting the findings. In reporting the findings, the study used the following steps: 1) checking for stationary among the variables for each country; 2) applying Unit Root Tests; and 3) testing the cointegration relation using Wald test. Once these steps have been conducted, and the optimal lag for ARDL model was determined, then using OLS, the study estimated coefficients of the selected variables for each country.

4.1.1. Austria

The analysis revealed that both of the unit root tests (ADF and P-P), indicate that Exchange rate is stationary and the remaining other variables are integrated order of 1 I (1) (Table 1.A). The next step in the analysis was testing the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). Preliminary results from using all the variables indicated that there is no cointegration relationship among the variables. Some of the variables might have correlation problems that might change the value of F-test, this study also tested cointegration while eliminating some of the insignificant variables. F-Test result without using exchange rate is also calculated. The result of F-test is 4.88, which is higher than the upper bound of 4.57 from the Pesaran table (Table 1.B). This result clearly indicates cointegration relationships among the variables. In the subsequent analysis the study estimated the long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the result of the long term ARDL estimates, ESI and Interest rate are statistically significant at the 1% probability level. Relative Price, Dummy of 2001(D01) and Dummy of 2003(D03) are not statistically significant at the 5% probability level. The sign of Interest rate is negative as the hypothesis suggested and is inelastic with a value of -0.18. On the other hand, ESI has a negative sign and is not aligned with the hypothesis, and also elastic, ranging from -1.26 to -1.65. This implies that 1 percent decrease in Economic Sentiment Indicator could increase tourist arrivals by 1.6 percent (Table 1.C).

There could be several reasons for these findings. First, Austria is a member country of EU, uses Euro as a currency and follows common monetary policy such as European Central Bank interest rates. Primarily, higher interest rates could create budget constraints for borrowing money even if there is higher ESI. Second, as explained earlier Euro is not a country specific and calculations of Relative Price and Exchange Rate include common Currency "Euro", which means Austria might not able to adjust its own economy and trade balance as needed, this could explain part of the negative outcome. Another reason for this result could be that, people from Austria recognize Turkey as an inferior good. When there is a doubt about the future, people could decide to prefer better options for lower priced destinations such as Turkey instead of going to more expensive vacation destinations. This study posits that most probable approach could be the notion of "Safe Harbor" effect. Because of the problems perceived to be associated with other possible destinations related to September 11, visitors from Austria could perceive Turkey as a safe place to visit.

The coefficient of the error correction term is -0.04 and highly significant. The inferences are that long-term relations are valid and exist among the variables and that the imbalance created by the short term shocks adjusts itself about 4% per period toward the long term equilibrium (Table 1.D). Diagnostic Tests and structural stability test results are presented in Table 1.D and Figure 1, respectively.

Table 1.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA ΔLNSTA	-1.117 -3.628***	-1.841 -3.766***	I(1)
LNESI ΔLNESI	-1.309 -9.344***	-1.356 -9.344***	I(1)
LNINT ΔLNINT	-1.278 -2.643*	-0.887 -3.403**	I(1)
LNEX ΔLNEX	-3.806***	-5.441***	I(0)
LNRP ΔLNRP	-1.767 -6.981***	-1.811 -6.371***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 1.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
2.94	3.12	4.25	No
	no LnEX		
4.88	3.47	4.57	Yes

Table 1.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,1) SBIC	ARDL(4,0,2,1)AIC
Variable	**Coefficient**	**Coefficient**
LNESI	-1.258** (0.541)	-1.647*** (0.526)
LNINT	-0.183*** (0.063)	-0.174*** (0.057)
LNRP	0.016 (0.252)	-0.141 (0.243)
C	16.047*** (2.418)	17.828*** (2.359)
D01	0.101 (0.083)	0.099 (0.075)
D03	0.087 (0.086)	0.115 (0.082)

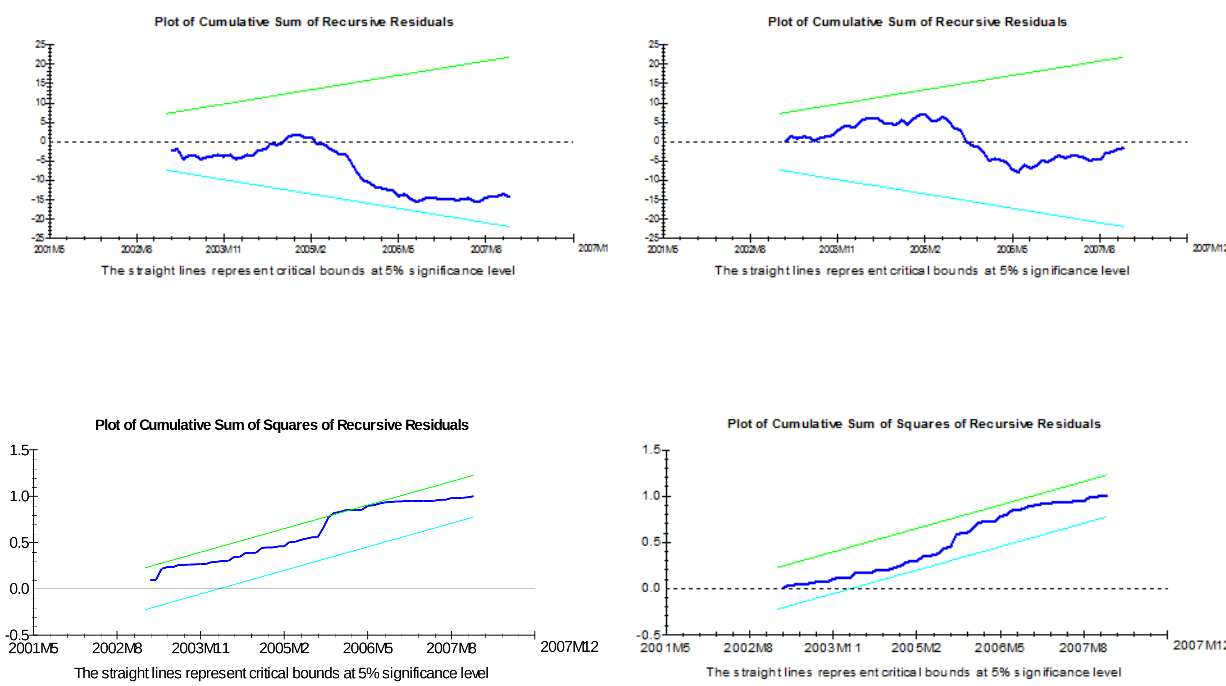
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 1.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,1) SBIC	ARDL(4,0,2,1)AIC
Variable	**Coefficient**	**Coefficient**
ΔLNSTA(-1)	2.227***	2.234***
ΔLNSTA(-2)	-1.990***	-1.995***
ΔLNSTA(-3)	0.779***	0.788***
ΔLNESI	-0.049**	-0.071***
ΔLNINT	-0.007***	0.006
ΔLNINT(-1)	-	0.042
ΔLNRP	0.028*	0.029**
ΔD01	0.004	0.004
ΔD03	0.003	0.005
ecm(-1)	-0.039***	-0.043***
	Diagnostic Tests	
Test A	16.793 (0.158)	14.056 (0.297)
Test B	3.481 (0.062)	6.895 (0.009)
Test C	4.326 (0.115)	13.685 (0.001)
Test D	5.8632 (0.015)	5.619 (0.018)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 1. CUSUM and CUSUMSQ for ARDL(4,0,0,1) SBIC and ARDL(4,0,2,1)AIC



4.1.2. Belgium

According to the results of unit root tests from Augmented Dickey Fuller and Phillips Perron all the variables are integrated order of 1 I(1) with the exception of the variable of Exchange Rate , which is integrated order of 0 I(0) (Table 2.A). The next step in the analysis was testing the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The value of F-test result is 4.43 and higher than the result from the CI (v) at the 5% probability level from the Pesaran table (which is 4.25) (Table 2.B). This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. Optimal lags for both AIC and SBIC were found to be the same for the ARDL Model. ESI has a correct sign as indicated in the hypothesis. However, it is not statistically significant. Similarly Relative Price also has a correct sign but not statistically significant. Interest rate is the only variable that is significant and has a correct sign (-0.24) (Table 2.C). While it is not highly elastic, still 1 percent increase in interest rate could lower tourist arrivals by 0.25 percent. According to the result of dummy D01, September 11 did not appear to have affected arrivals negatively that confirms our “Safe Harbor” approach. This result implies that tourists from Belgium consider Turkey as a safe vacation destination.

The coefficient of the error correction term is -0.03 and highly significant, suggesting that long-term relations are valid among the variables. This finding also implies that the imbalance created by the short term shocks adjusts about 3% per period toward the long term equilibrium (Table 2.D). Diagnostic Tests and structural stability test results are presented in Table 2.D and Figure 2, respectively.

Table 2.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LSTA	-1.071	-0.547	I(1)
ΔLSTA	-3.449**	-3.035**	
LESI	-1.624	-1.780	I(1)
ΔLESI	-9.434***	-9.434***	
LINT	-1.278	-0.887	I(1)
ΔLINT	-2.215	-3.403**	
LEX	-3.806***	-5.441***	I(0)
ΔLEX			
LNRP	-1.895	-1.932	I(1)
ΔLNRP	-6.797***	-6.495***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 2.B: F-Test Results

F-Test Result			
F-Test	**Table CI(v) at 5% Level**		**Cointegration**
	I(0)	*I(1)*	
4.43	3.12	4.25	Yes

Table 2.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0,0) SBIC	ARDL(4,0,0,0,0) AIC
Variable	**Coefficient**	**Coefficient**
LNESI	0.381	Same as SBIC
	(0.093)	-
LNINT	-0.237**	-
	(0.093)	-
LNRP	-0.419	-
	(0.496)	-
LNEX	-0.255	-
	(0.443)	-
C	8.491***	-
	(1.787)	-
D01	0.182**	-
	(0.085)	-
D03	-0.044	-
	(0.101)	-

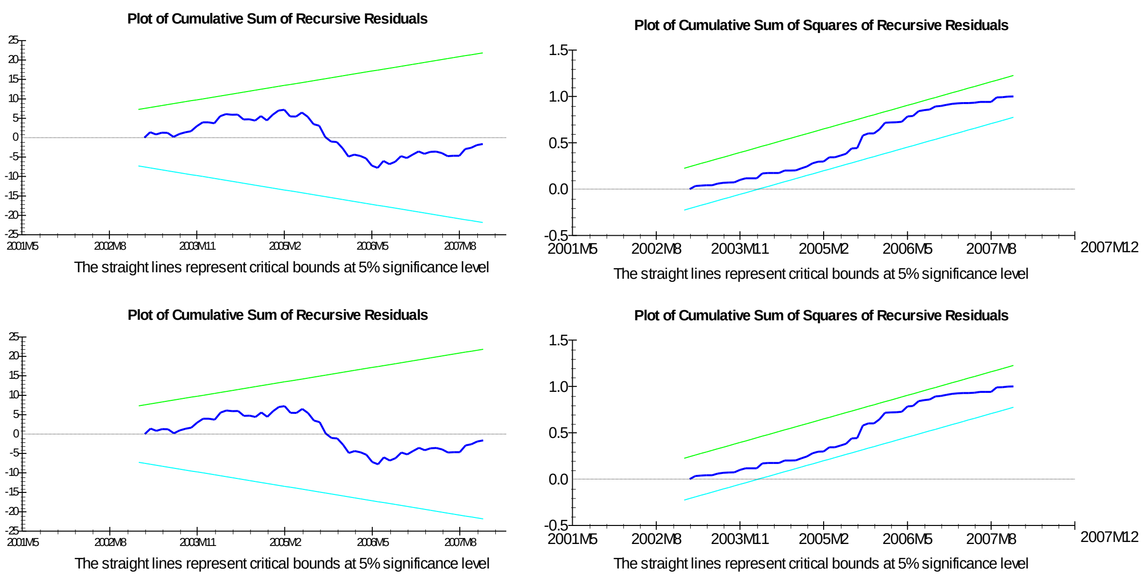
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 2.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0,0) SBIC	ARDL(4,0,0,0,0) AIC
Variable	**Coefficient**	**Coefficient**
ΔLNSTA(-1)	2.179***	Same as SBIC
ΔLNSTA(-2)	-1.914***	-
ΔLNSTA(-3)	0.684***	-
ΔLNESI	0.0101	-
ΔLNINT	-0.006*	-
ΔLNINT(-1)	-	-
ΔLNRP	-0.011	-
ΔLNEX	-0.007	-
ΔD01	0.005**	-
ΔD03	0.001	-
ecm(-1)	-0.027***	-
Diagnostic Tests		
Test A	10.089 (0.608)	-
Test B	0.229 (0.633)	-
Test C	1.215 (0.545)	-
Test D	0.089 (0.765)	-

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 2. CUSUM and CUSUMSQ for ARDL(4,0,0,0,0) SBIC and ARDL(4,0,0,0,0) AIC



4.1.3. Denmark

The analysis of Denmark data based on Augmented Dickey Fuller and Phillips Perron tests revealed that all the variables are integrated order of 1 I(1) except the variable of Exchange Rate which is integrated order of 0, I(0) (Table 3.A). The cointegration relation using Wald test (Joint significance F-Test) showed that the value of F-test is 4.58 and higher than the result from the CI (v) at the 5% probability level obtained from the Pesaran table (which is 4.25) (Table 3.B). This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables (Denmark uses own currency and monetary policy). The next step was to estimate long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the long term ARDL estimates, while ESI has a correct sign as indicated in the hypothesis, it is not statistically significant. Similarly, Relative Price also has a correct sign but not statistically significant. Interest rate is the only variable that is significant and has a correct sign of -0.35 (Table 3.C). While it is not highly elastic still 1 percent increase in interest rate could lower tourist arrivals by 0.35 percent. According to the result of dummy D01, September 11 did not affect arrivals negatively. This finding is again attributed to the notion of positive “safe Harbor” which confirms that Turkey is considered as a safe destination.

The coefficient of the error correction term is -0.02 and highly significant. The inferences are that long-term relations are valid and exist among the variables and that the imbalance created by the short term shocks adjusts itself about 2% per period toward the long term equilibrium (Table 3.D). Diagnostic Tests and structural stability test results are presented in Table 3.D and Figure 3, respectively.

Table 3.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA	-1.641	-1.332	I(1)
ΔLNSTA	-3.294**	-3.009**	
LNESI	-1.599	-1.74	I(1)
ΔLNESI	-10.241***	-10.169***	
LNINT	-1.405	-1.159	I(1)
ΔLNINT	-3.234**	-3.706***	
LNEX	-3.824***	-5.461***	I(0)
ΔLNEX			
LNRP	-1.633	-1.751	I(1)
ΔLNRP	-7.036***	-6.334***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 3.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
4.58	3.12	4.25	Yes

Table 3.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0,0) SBIC	ARDL(4,2,4,0,0) AIC
Variable	**Coefficient**	**Coefficient**
LESI	0.058	0.044
	(0.472)	(0.831)
LINT	-0.352***	-0.366***
	(0.117)	(0.119)
LNRP	-0.126	0.367
	(0.516)	(0.519)
LEX	-0.138	0.028
	(0.419)	(0.377)
C	9.192***	9.034**
	(2.218)	(4.003)
D01	0.216**	
	(-0.099)	
D03	-0.006	
	-0.109	

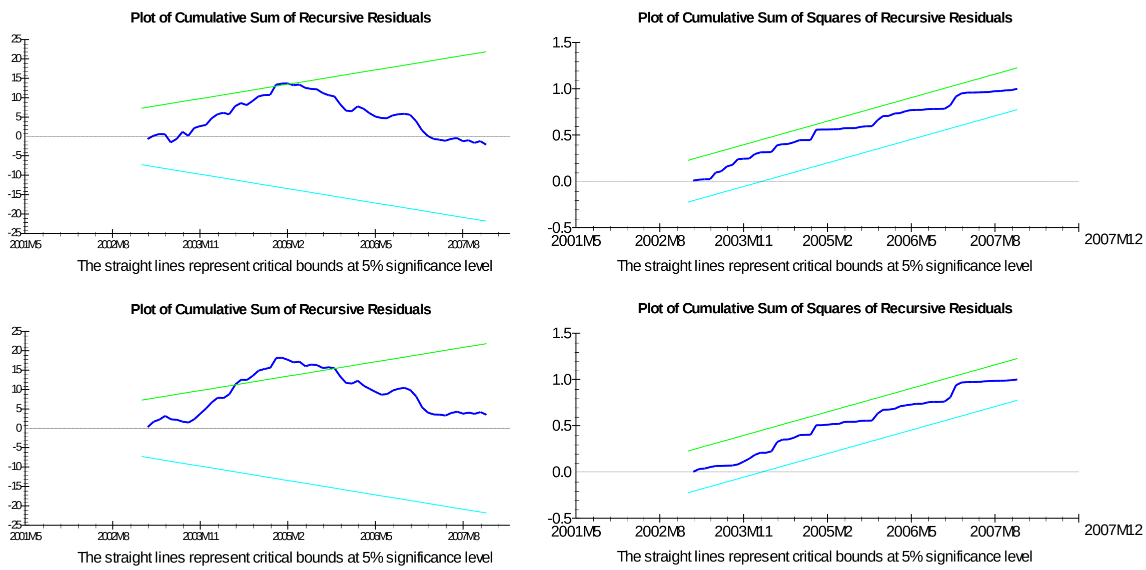
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 3.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0,0) SBIC	ARDL(4,2,4,0,0) AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.271***	2.301***
ΔLSTA(-2)	-2.078***	-2.099***
ΔLSTA(-3)	0.784***	0.779***
ΔLESI	0.001	-0.033
ΔLESI(-1)	-	-0.033*
ΔLINT	-0.007	-0.001
ΔLINT(-1)	-	0.006
ΔLINT(-2)	-	-0.023
ΔLINT(-3)	-	0.042**
ΔLNRP	-0.003	0.008
ΔLEX	-0.003	0.0006
ΔD01	0.004**	0.006***
ΔD03	-0.0001	-0.0002
ecm(-1)	-0.021***	-0.023***
Diagnostic Tests		
Test A	19.758 (0.072)	23.513 (0.024)
Test B	0.9155 (0.339)	0.251 (0.617)
Test C	0.4635 (0.793)	4.071 (0.131)
Test D	0.7093 (0.400)	0.0008 (0.977)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 3. CUSUM and CUSUMSQ for ARDL(4,0,0,0,0) SBIC and ARDL(4,2,4,0,0) AIC



4.1.4. United Kingdom (UK)

According to the results of the unit root tests from Augmented Dickey Filler and the Phillips and Perron revealed that Exchange rate is stationary and remaining other variables are integrated order of 1 I(1) (Table 4.A). F-test analysis was conducted to test the cointegration relation among variables (Joint significance F-Test/Wald Test) and comparing the result with the table from Pesaran (2001). The Preliminary result of F-test using all the variables indicated that the result lies in the inconclusive region. This study also tested cointegration relationship while eliminating some of the insignificant variables. F-Test result without using interest rate is also calculated. F-test result without interest rate was 5.64, which is higher than the upper bound of 4.57 from the Pesaran table (Table 4.B). It clearly indicates cointegration relationships among the variables. In the next step the study estimated the long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). Long term ARDL estimates (Table 4.C) indicate that, ESI has positive elasticity (0.85-1.1), if there is a 1 percent change in ESI will increase tourist arrivals from UK by 1.1 percent. UK uses own currency and follows own monetary policies (except some mandatory requirements) comparing to the other origin countries, this also confirms why ESI result from the countries without own currency and monetary policy could be negative. Relative Price result (0.89-1.23) was significant but not aligned with the hypothesis, this result might suggest that price is not very important factor in the selection of Turkey as a vacation destination for visitors from UK. Result of the Exchange rate variable (0.8) has the correct sign and is not affected by the use of Euro like the other countries, which confirms earlier explanations regarding the difference when country uses own currency vs. common currency approach. Similar to the earlier findings, the result of Dummy D01(0.397) confirms the existence of “Safe Harbor” approach, thus visitors from UK consider Turkey as a safe vacation destination.

The coefficient of the error correction term is -0.02 and highly significant. The inferences are that long-term relations are valid and exist among the variables and that the imbalance created by the short term shocks adjusts itself about 2% per period toward the long term equilibrium (Table 4.D). Diagnostic Tests and structural stability test results are presented in Table 4.D and Figure 4, respectively.

Table 4.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA ΔLNSTA	-0.707 -4.263***	-0.146 -2.740*	I(1)
LNESI ΔLNESI	-1.964 -11.586***	-2.484 -11.598***	I(1)
LNINT ΔLNINT	-0.599 -4.206***	-0.880 -5.317***	I(1)
LNEX ΔLNEX	-4.104***	-6.010***	I(0)
LNRP ΔLNRP	-1.402 -6.692***	-1.206 -6.174***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 4.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
3.56	3.12	4.25	Inconclusive
	No LnINT		
5.64	3.47	4.57	Yes

Table 4.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0) SBIC	ARDL(4,3,4,4) AIC
Variable	**Coefficient**	**Coefficient**
LNESI	0.852* (0.541)	1.103** (0.500)
LNRP	0.890* (0.485)	1.230** (0.542)
LNEX	0.814* (0.431)	0.745* (0.404)
C	7.653*** (2.301)	6.919*** (2.082)
D01	0.397** (0.168)	0.267** (0.128)
D03	-0.051 (0.108)	-0.114 (0.097)

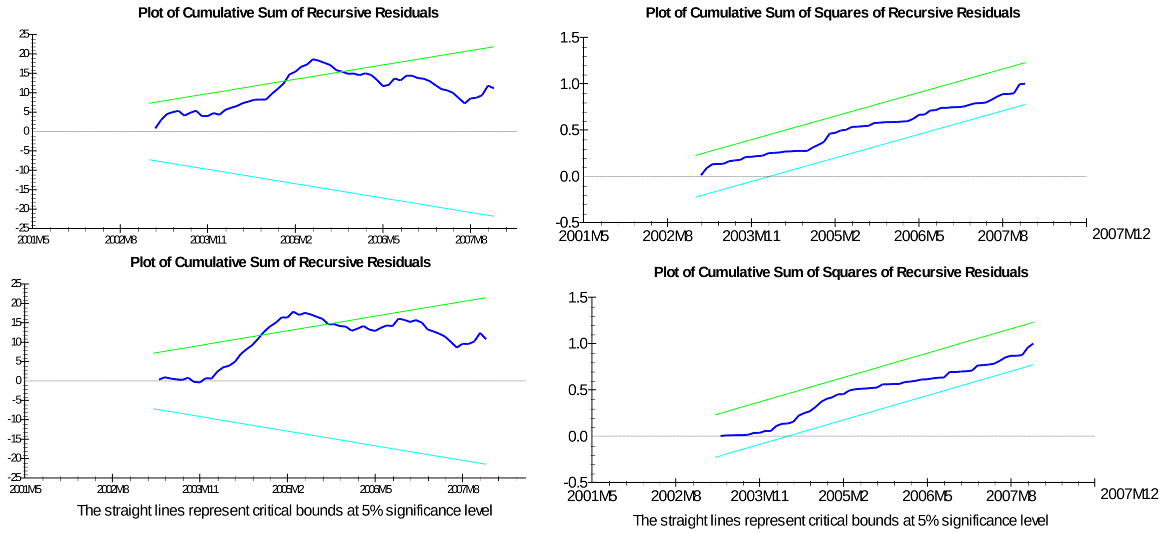
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 4.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0) SBIC	ARDL(4,3,4,4) AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.0605***	2.119***
ΔLSTA(-2)	-1.777***	-1.866***
ΔLSTA(-3)	0.611***	0.662***
ΔLESI	0.019*	0.017
ΔLESI(-1)	-	-0.049***
ΔLESI(-2)	-	-0.032**
ΔLNRP	0.020**	0.084*
ΔLNRP(-1)	-	-0.032
ΔLNRP(-2)	-	-0.046
ΔLNRP(-3)	-	0.091***
ΔLEX	0.018***	0.076
ΔLEX(-1)	-	-0.019
ΔLEX(-2)	-	-0.032
ΔLEX(-3)	-	0.084**
ΔD01	0.009***	0.007***
ΔD03	-0.001	-0.003
ecm(-1)	0.023***	-0.027***
Diagnostic Tests		
Test A	31.715 (0.002)	24.503 (0.017)
Test B	5.206 (0.023)	13.244 (0.000)
Test C	1.197 (0.550)	0.601 (0.740)
Test D	0.301 (0.584)	0.008 (0.930)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 4. CUSUM and CUSUMSQ for ARDL(4,0,0,0) SBIC and ARDL(4,3,4,4) AIC



4.1.5. Finland

The analysis revealed that both ADF and P-P unit root tests indicate that Exchange rate is stationary and the remaining other variables are integrated order of 1 I(1) (Table 5.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The value of F-test result is 4.8 and higher than the result from the CI(v) at the 5% probability level from the Pesaran table (Table 5.B). This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. The next step was to estimate long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the long term ARDL estimates, ESI, Interest rate and Dummy of 2001(D01) are statistically significant.

Relative Price and Exchange rate are not statistically significant. Interest rate is negative with a value of -0.26 as the hypothesis suggested. On the other hand ESI is negative and not aligned with the hypothesis and also elastic with a value ranging from -1.21 to -1.47 (Table 5.C). This implies that 1 percent decrease in ESI could increase tourist arrivals by 1.5 percent.

There could be several explanations for this outcome. Finland follows a common monetary policy by EU, and uses Euro as a currency. As explained earlier, Euro is not a country specific currency and calculations of Relative Price and Exchange Rate include the common Currency of “Euro”, which means Finland might not able to adjust its own economy and trade balance as needed, this could explain part of the negative outcome. Another reason for this result could be that, people from Finland recognize Turkey as an inferior good. When there is a doubt about the future, people could decide to prefer better options for lower priced destinations such as Turkey instead of going to more expensive vacation destinations. This study posits that most probable approach could be the notion of “Safe Harbor” effect. Visitors from Finland perceive Turkey as a safe place to visit. This finding is confirmed by the result of Dummy 2001(0.239); the result indicates positive and significant relationship between September 11 and tourist arrivals from Finland to Turkey.

The coefficient of the error correction term is -0.03 and highly significant, there are two outcomes from this result. First this indicates that long-term relations are valid among the variables, secondly this implies that the imbalance created by the short term shocks adjust itself about 3% per period toward long term equilibrium (Table 5.D). Diagnostic Tests and structural stability test results are presented in Table 5.D and Figure 5, respectively.

Table 5.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA	-1.537	-1.748	I(1)
ΔLNSTA	-4.216***	-2.780*	
LNESI	-2.025	-2.611*	I(0)
ΔLNESI	-11.139***	-11.346***	
LNINT	-1.278	-0.887	I(1)
ΔLNINT	-3.619***	-3.403**	
LNEX	-3.806***	-5.510***	I(0)
ΔLNEX			
LNRP	-1.513	-1.554	I(1)
ΔLNRP	-6.965***	-6.309***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 5.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
4.8	3.12	4.25	Yes

Table 5.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0,0) SBIC	ARDL(4,0,1,0,2) AIC
Variable	**Coefficient**	**Coefficient**
LNESI	-1.205* (0.762)	-1.486* (0.880)
LNINT	-0.265** (0.126)	-0.305** (0.134)
LNRP	-0.203 (0.517)	-1.125 (0.707)
LNEX	-0.703 (0.425)	-0.958** (0.476)
C	13.566*** (3.530)	15.807*** (4.083)
D01	0.239** (0.099)	0.223** (0.102)
D03	-0.091 (0.124)	-0.051 (0.130)

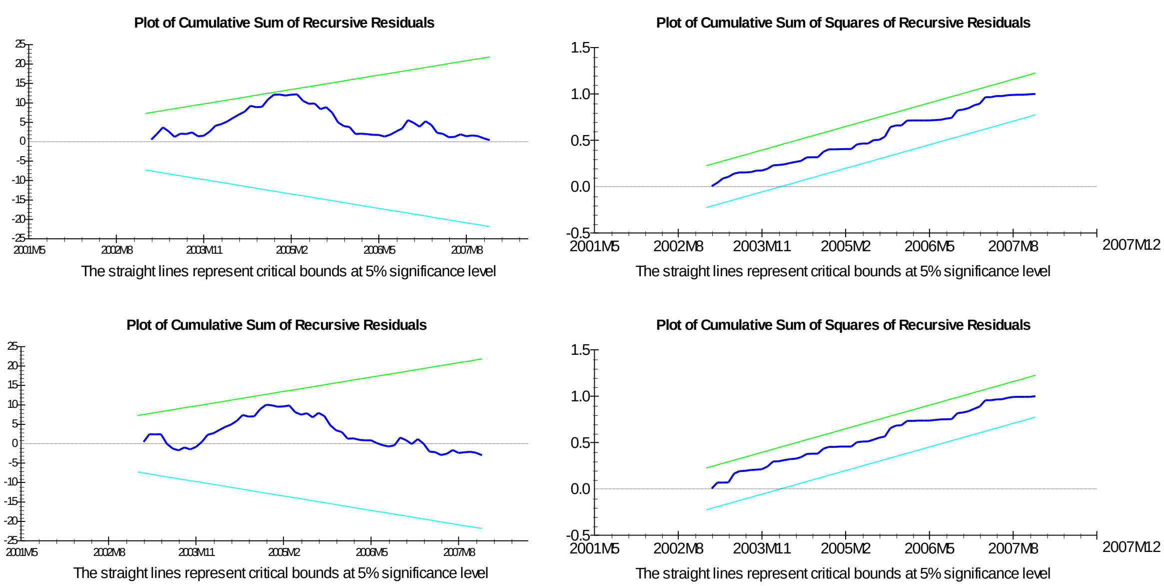
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 5.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0,0) SBIC	ARDL(4,0,1,0,2) AIC
Variable	**Coefficient**	**Coefficient**
ΔLNSTA(-1)	2.203***	2.179***
ΔLNSTA(-2)	-2.041***	-1.997***
ΔLNSTA(-3)	0.788***	0.770***
ΔLNESI	-0.027	-0.037**
ΔLNINT	-0.007**	0.034
ΔLNRP	-0.005	-0.028*
ΔLNEX	-0.018*	-0.048***
ΔD01	0.006***	0.006**
ΔD03	-0.002	-0.001
ecm(-1)	-0.026***	-0.025***
Diagnostic Tests		
Test A	26.702 (0.009)	27.182 (0.007)
Test B	0.295 (0.587)	1.931 (0.165)
Test C	0.467 (0.792)	1.060 (0.588)
Test D	1.581 (0.209)	0.999 (0.318)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 5. CUSUM and CUSUMSQ for ARDL(4,0,0,0,0) SBIC and ARDL(4,0,1,0,2) AIC



4.1.6. France

The analysis of France data based on Augmented Dickey Fuller and Phillips Perron tests revealed that all the variables are integrated order of 1 I(1) except the variable of Exchange Rate which is integrated order of 0, I(0) (Table 6.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The value of F-test result is 3.19 and lies in the inconclusive region from the CI(v) at the 5% probability level from the Pesaran table (Table 6.B). The result indicates that there might be partial cointegration relationship among the variables. However the notion of partial cointegration approach is beyond the scope of this study.

Table 6.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA	-0.660	-0.942	I(1)
ΔLNSTA	-3.756***	-3.332**	
LNESI	-2.474	-2.344	I(1)
ΔLNESI	-7.750***	-7.840***	
LNINT	-1.278	-0.887	I(1)
ΔLNINT	-3.619***	-3.403**	
LNEX	-3.806***	-5.441***	I(0)
ΔLNEX			
LNRP	-1.782	-1.881	I(1)
ΔLNRP	-6.995***	-6.335***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 6.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
3.19	3.12	4.25	Inconclusive

4.1.7. Germany

The analysis revealed that both ADF and P-P unit root tests indicate that Exchange rate is stationary and the remaining other variables are integrated order of 1 I(1) (Table 7.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). Preliminary result from using all the variables indicated that the result lies in the inconclusive region. F-Test result without using exchange rate is also calculated. The result of F-test is 4.71, which is higher than the upper bound of 4.57 from the Pesaran table (Table 7.B). This result indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. The next step was to estimate long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the long term ARDL estimates, ESI and Interest rate are statistically significant. Relative Price and Exchange rate are not statistically significant. The sign of Interest rate is negative as the hypothesis suggested and inelastic with value of -0.21. On the other hand, ESI has a negative sign and is not aligned with the hypothesis, and also elastic, ranging from -0.62 to -0.8 (Table 7.C), meaning 1 percent decrease in Economic Sentiment Indicator could increase tourist arrivals by 0.6 percent.

There could be several reasons for this outcome. First, Germany is a member country of EU, uses Euro as a currency and follows common monetary policy such as European Central Bank interest rates. Primarily, higher interest rates could create budget constraints for borrowing money even if there is higher ESI. Second, as explained earlier Euro is not a country specific and calculations of Relative Price and Exchange Rate include common Currency “Euro”, which means Germany might not able to adjust its own economy and trade balance as needed, this could explain part of the negative outcome. Another reason for this result could be that, people from Germany recognize Turkey as an inferior good. When there is a doubt about the future, people may prefer better options for lower priced destinations such as Turkey instead of going to more expensive vacation destinations. This study posits that most probable approach could be the notion of “Safe Harbor” effect. Because of the problems perceived to be associated with other possible destinations related to September 11, visitors from Germany could perceive Turkey as a safe place to visit. One other probable approach could be that Germany has a significant number of Turkish populations, more than 2 million people and they visit Turkey no matter how they feel about the economy.

The coefficient of the error correction term is -0.04 and highly significant. The inferences are that long-term relations are valid and exist among variables and that the imbalance created by sort term shocks adjusts itself about 4% per period toward the long term equilibrium (Table 7.D). Diagnostic tests and structural stability test results are presented in Table 7.D and Figure 7 respectively.

Table 7.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA ΔLNSTA	-1.990 -4.315***	 -3.247**	I(1)
LNESI ΔLNESI	-1.241 -7.478***	-1.276 -7.613***	I(1)
LNINT ΔLNINT	-1.272 -3.582***	-0.887 -3.403**	I(1)
LNEX ΔLNEX	-3.806***	-5.441***	I(0)
LNRP ΔLNRP	-1.750 -6.612***	-1.769 -6.298***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 7.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
3.97	3.12	4.25	Inconclusive
	no LnEX		
4.71	3.47	4.57	Yes

Table 7.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0) SBIC	ARDL(4,3,0,0)AIC
Variable	**Coefficient**	**Coefficient**
LESI	-0.617*	-0.803**
	(0.323)	(0.384)
LINT	-0.201***	-0.179***
	(0.047)	(0.053)
LPR	-0.022	-0.099
	(0.176)	(0.193)
C	15.274***	16.012***
	(1.399)	(1.629)
D01	0.089	0.097
	(0.059)	(0.068)
D03	-0.004	-0.049
	(0.069)	(0.071)

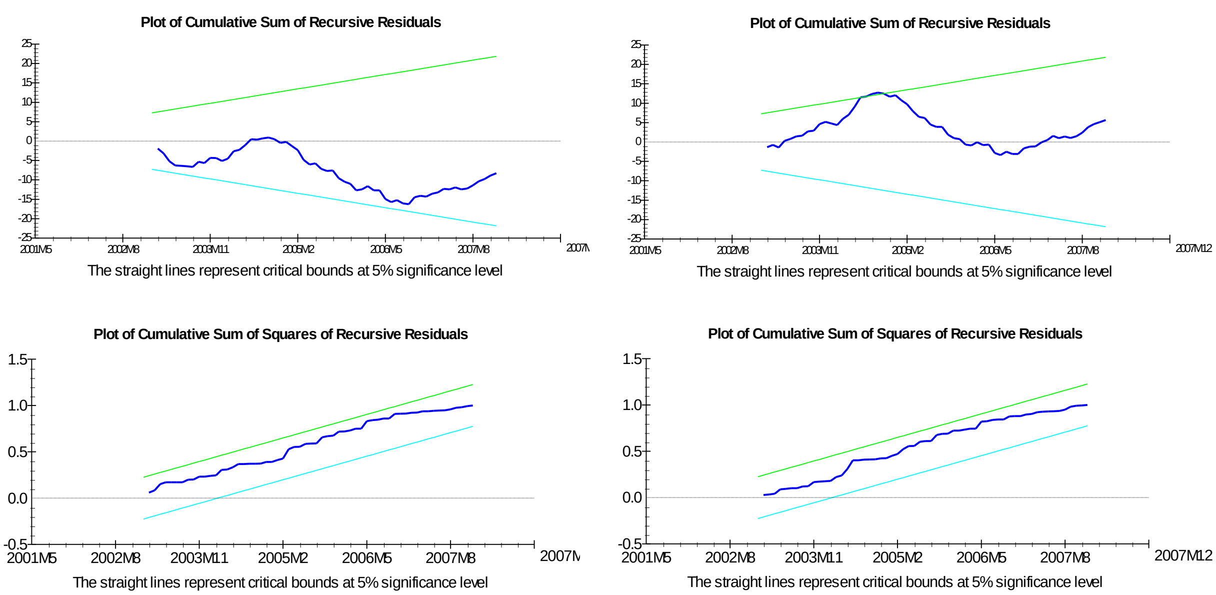
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 7.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0) SBIC	ARDL(4,3,0,0)AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.272***	2.259***
ΔLSTA(-2)	-2.044***	-2.037***
ΔLSTA(-3)	0.0782***	0.790***
ΔLESI	-0.024*	0.015
ΔLESI(-1)		0.036
ΔLESI(-2)		-0.041
ΔLINT	-0.008***	0.007***
ΔLPR	-0.0008	-0.004
ΔD01	0.003	0.004
ΔD03	-0.0001	-0.002
ecm(-1)	-0.039***	-0.038***
	Diagnostic Tests	
Test A	24.977 (0.015)	18.392 (0.104)
Test B	0.375 (0.540)	4.808 (0.028)
Test C	1.742 (0.418)	1.069 (0.586)
Test D	0.090 (0.764)	1.020 (0.313)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 7. CUSUM and CUSUMSQ for ARDL(4,0,0,0) SBIC and ARDL(4,3,0,0)AIC



4.1.8. Greece

According to the results of unit root tests from Augmented Dickey Fuller and Phillips Perron all the variables are integrated order of 1 I(1) with the exception of the variable of Exchange Rate, which is integrated order of 0 I(0) (Table 8.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The preliminary F-test result using all the variables indicated that the result lies in the inconclusive region. The result of F-test calculation is 5.17, which is higher than the upper bound of 4.57 from the Pesaran table (Table 8.B). This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. In the subsequent analysis the study estimated the long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the result of the long term ARDL estimates, Interest rate and Relative Price are statistically significant. ESI is not statistically significant. The sign of Interest rate is negative as the hypothesis suggested with value of -0.7. Similarly the sign of Relative Price is negative as the hypothesis suggested with the value ranging from -0.68 to -0.78 (Table 8.C).

The coefficient of the error correction term is -0.03 and highly significant, suggesting that long term relations are valid among variables. This finding also implies that the imbalance created by the short term shocks adjust about 3% per period toward long term equilibrium (Table 8.D). Diagnostic tests and structural stability test results are presented in Table 8.D and Figure 8, respectively.

Table 8.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA	-2.205	-1.695	I(1)
ΔLNSTA	2.155	-3.167**	
LNESI	-2.213	-2.142	I(1)
ΔLNESI	-8.675***	-8.682	
LNINT	-1.278	-0.887	I(1)
ΔLNINT	-3.619***	-3.403**	
LNEX	-2.805*	-5.510***	I(0)
ΔLNEX			
LNRP	-2.214	-2.520	I(1)
ΔLNRP	-7.143***	-6.378***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 8.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
3.67	3.12	4.25	Inconclusive
No LnEX			
5.17	3.47	4.57	Yes

Table 8.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0) SBIC	ARDL(4,0,0,1)AIC
Variable	**Coefficient**	**Coefficient**
LESI	-0.623 (0.423)	-0.015 (0.391)
LINT	-0.703*** (0.086)	-0.706*** (0.079)
LNRP	-0.676** (0.333)	-0.780** (0.324)
C	10.851*** (1.898)	10.640*** (1.754)
D01	0.076 (0.096)	0.029 (0.089)
D03	-0.052 (0.110)	-0.066 (0.101)

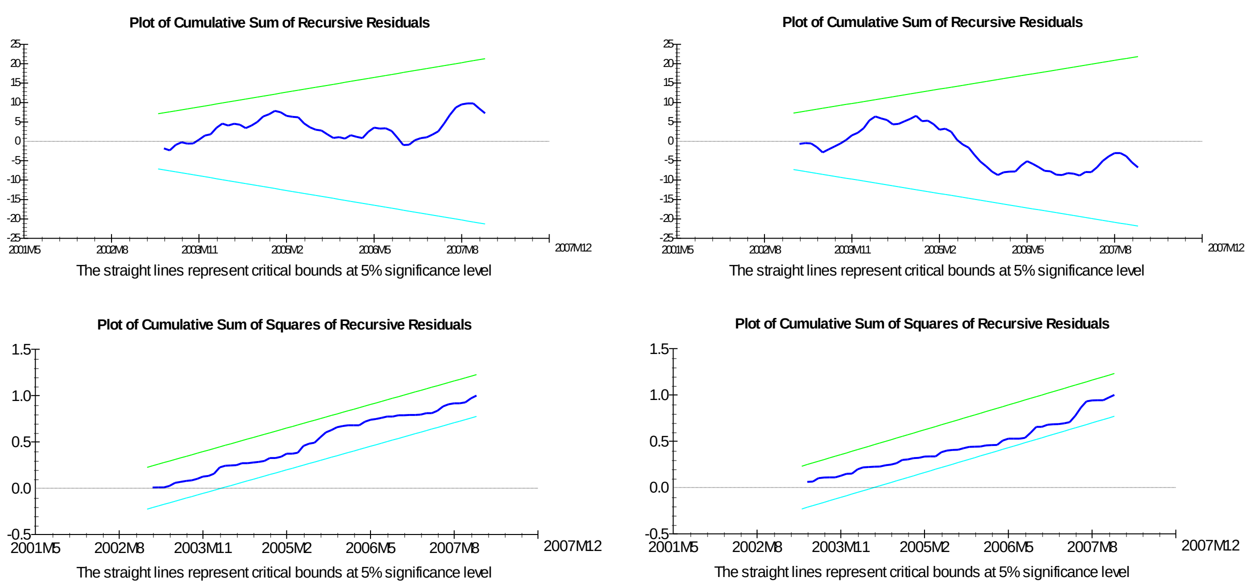
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 8.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0) SBIC	ARDL(4,0,0,1)AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.259***	2.222***
ΔLSTA(-2)	-2.070***	-2.019***
ΔLSTA(-3)	0.798***	0.779***
ΔLESI	-0.002	-0.0004
ΔLINT	-0.019***	-0.020***
ΔLNRP	-0.018**	-0.004
ΔD01	0.002	-0.0008
ΔD03	-0.001	-0.002
ecm(-1)	-0.027***	-0.029***
Diagnostic Tests		
Test A	32.770 (0.001)	30.099 (0.003)
Test B	0.1999 (0.655)	0.105 (0.746)
Test C	1.798 (0.407)	2.623 (0.269)
Test D	0.0366 (0.848)	0.022 (0.881)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 8. CUSUM and CUSUMSQ for ARDL(4,0,0,0) SBIC and ARDL(4,0,0,1)AIC



4.1.9. The Netherland

The analysis of The Netherland data based on Augmented Dickey Fuller and Phillips Perron tests revealed that all the variables are integrated order of 1 I(1) except the variable of Exchange Rate which is integrated order of 0, I(0) (Table 9.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The value of F-test result is 2.64 and is below from the CI(v) at the 5% probability level from the Pesaran table (Table 9.B). This indicates that there is no long term cointegration relationship among the variables.

Table 9.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA ΔLNSTA	-2.03 3.364**	-1.740 -3.107**	I(1)
LNESI ΔLNESI	-1.098 -7.403***	-1.085 -7.337***	I(1)
LNINT ΔLNINT	-1.278 -3.619***	-0.809 -3.403**	I(1)
LNEX ΔLNEX	-3.806***	-5.510***	I(0)
LNRP ΔLNRP	-1.586 -7.109***	-1.802 -6.137***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 9.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
2.64	3.12	4.25	No

4.1.10. Ireland

The analysis revealed that both ADF and P-P unit root tests indicate that Exchange rate and Economic Sentiment Indicator are stationary and the remaining other variables are integrated order of 1 I(1)(Table 10.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The result of F-test is 5.63, which is higher than the upper bound of 4.25 from the Pesaran table (Table 10.B). This result clearly indicates cointegration relationships among the variables. Optimal lags for the variables of the ARDL model found using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the long term ARDL estimates, all of the variables are statistically significant except the variable for Dummy 2001. The sign of ESI is positive as the hypothesis suggested and ranges from 0.6 to 1.5 depending on the lag structure of the model. The sign of Interest rate is negative and inelastic with a value of -0.35. The sign of Relative Price is negative and elastic with a value of -1. Exchange rate is the only significant variable with the incorrect sign (-0.88) (Table 10.C). Ireland is member of EU, uses Euro as a currency, and also part of the PIIGS (EU members with economic problems). Euro is not a country specific and the calculation of Exchange Rate includes common Currency “Euro”, which means Ireland might not able to adjust its own economy and trade balance as needed, this could explain part of the negative outcome of the exchange rate finding. Dummy 2003 is also statistically significant and positive, which suggest that tourist arrivals from Ireland were not affected by Iraq War. This finding, again, is consistent with the tenant of “Safe Harbor” approach.

The coefficient of the error correction term is -0.01 and highly significant, there are two outcomes from this result. First, the result indicates that the long-term relations are valid among the variables, secondly this implies that the imbalance created by the short term shocks adjust itself about 1% per period toward long term equilibrium (Table 10.D). Diagnostic tests and structural stability test results are presented in Table 10.D and Figure 10 Respectively.

Table 10.A: Unit Root Tests Results: ADF and P-P

Variables	**Augmented Dickey Fuller (ADF)**	**Phillips Perron (P-P)**	**Decision**
LNSTA ΔLNSTA	-1.328 -4.970***	0.079 -2.086	I(1)
LNESI ΔLNESI	-3.310**	-3.355**	I(0)
LNINT ΔLNINT	-1.278 -3.619***	-0.887 -3.403**	I(1)
LNEX ΔLNEX	-2.805*	-5.510***	I(0)
LNRP ΔLNRP	-2.038 -6.882***	-2.305 -6.196***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 10.B: F-Test Results

F-Test	**Table CI(v) at 5% Level**		**Cointegration**
	I(0)	*I(1)*	
5.63	3.12	4.25	Yes

Table 10.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,2,2) SBIC	ARDL(4,3,0,4,4) AIC
Variable	**Coefficient**	**Coefficient**
LESI	0.615* (0.337)	1.534** (0.660)
LINT	-0.349*** (0.093)	-0.299*** (0.089)
LNRP	-0.996** (0.417)	-0.843 (0.613)
LEX	-0.882*** (0.316)	-0.667 (0.437)
C	5.814*** (1.516)	1.771 (2.951)
D01	0.073 (0.082)	0.107 (0.091)
D03	0.202** (0.092)	0.190** (0.095)

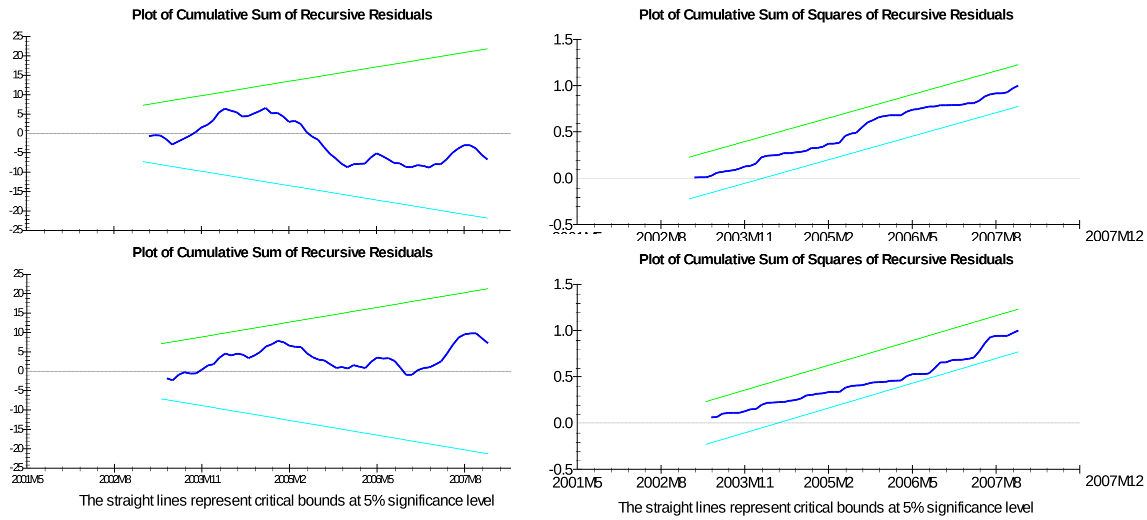
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 10.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,2,2) SBIC	ARDL(4,3,0,4,4) AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.222***	2.252***
ΔLSTA(-2)	-1.724***	-1.777***
ΔLSTA(-3)	0.475***	0.489***
ΔLESI	0.005**	0.004*
ΔLESI(-1)	-	-0.009***
ΔLESI(-2)	-	-0.008***
ΔLINT	-0.003***	-0.002***
ΔLNRP	-0.009	-0.009
ΔLNRP(-1)	0.031***	0.028***
ΔLNRP(-2)	-	-0.002
ΔLNRP(-3)	-	-0.019**
ΔLEX	-0.013	-0.014
ΔLEX(-1)	0.032***	0.026***
ΔLEX(-2)	-	-0.005
ΔLEX(-3)	-	-0.020**
ΔD01	0.0006	-0.0008
ΔD03	0.002**	-0.008***
ecm(-1)	-0.009***	-0.008***
Diagnostic Tests		
Test A	30.563 (0.002)	32.391 (0.001)
Test B	-	-
Test C	0.685 (0.710)	0.452 (0.798)
Test D	2.102 (0.147)	0.028 (0.867)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 10. CUSUM and CUSUMSQ - ARDL(4,0,0,2,2) SBIC and ARDL(4,3,0,4,4) AIC



4.1.11. Italy

According to the results of unit root tests from Augmented Dickey Fuller and Phillips Perron Exchange rate and ESI are stationary and the remaining other variables are integrated order of 1 I(1) (Table 11.A). The cointegration relation using Wald test (Joint significance F-Test) showed that the value of F-test is 5.8 and higher than the result from the CI(v) at the 5% probability level obtained from the Pesaran table (table 11.B). This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. The next step was to estimate long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the long term ARDL estimates, none of the variables are statistically significant except the variable of Dummy 2003. While ESI, Interest rate, and

Relative Price all have a correct sign as indicated in the hypothesis, they are not statistically significant (Table 11.C). According to the result of dummy D03, Iraq war did not affect arrivals negatively. This finding is again attributed to the notion of positive "Safe Harbor" which confirms that Turkey is considered as a safe destination.

The coefficient of the error correction term is -0.03 and highly significant. The inferences are that long-term relations are valid and exist among the variables and that the imbalance created by the short term shocks adjusts itself about 3% per period toward long term equilibrium (Table 11.D). Diagnostic Tests and structural stability test results are presented in Table 11.D and Figure 11, respectively.

Table 11.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA	-0.893	-0.538	I(1)
ΔLNSTA	-2.796*	-3.510**	
LNESI	-2.531	-2.806*	I(0)
ΔLNESI	-10.035***		
LNINT	-1.278	-0.887	I(1)
ΔLNINT	-3.619***	-3.403**	
LNEX	-2.805*	-5.510***	I(0)
ΔLNEX			
LNRP	-1.878	-2.017	I(1)
ΔLNRP	-7.020***	-6.185***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 11.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
5.8	3.12	4.25	Yes

Table 11.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,1,0) SBIC	ARDL(4,3,0,4,4) AIC
Variable	**Coefficient**	**Coefficient**
LESI	0.611 (0.919)	0.874 (1.252)
LINT	-0.175 (0.181)	-0.152 (0.187)
LNRP	-0.377 (1.194)	-0.290 (1.266)
LEX	-0.386 (1.045)	-0.336 (1.073)
C	7.012 (4.341)	5.699 (5.916)
D01	0.107 (0.143)	0.084 (0.145)
D03	-0.305* (0.184)	-0.376* (0.218)

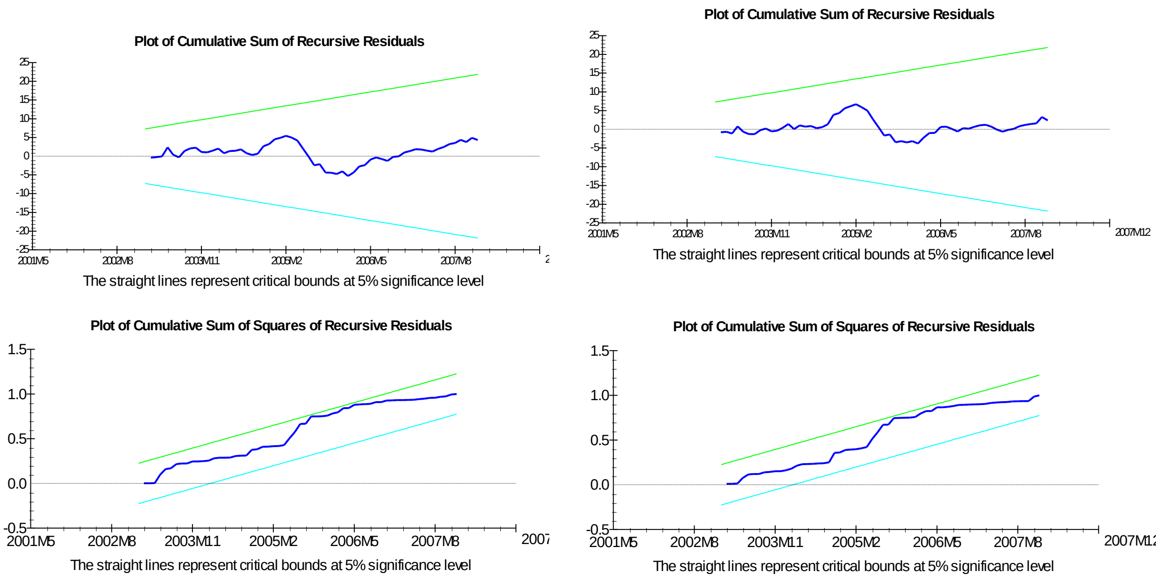
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 11.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,1) SBIC	ARDL(4,0,2,1)AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.099***	2.107***
ΔLSTA(-2)	-1.844***	-1.866***
ΔLSTA(-3)	0.668***	0.685***
ΔLESI	0.016	0.023
ΔLINT	-0.005	-0.025
ΔLINT(-1)	-	0.065*
ΔLINT(-2)	-	-0.097***
ΔLNRP	0.034	0.029
ΔLEX	-0.011	-0.008
ΔD01	0.003	0.002
ΔD03	-0.008	-0.010**
ecm(-1)	-0.027***	-0.026***
Diagnostic Tests		
Test A	31.988 (0.001)	31.372 (0.002)
Test B	2.197 (0.139)	0.391 (0.532)
Test C	6.853 (0.033)	0.147 (0.929)
Test D	5.136 (0.023)	2.181 (0.140)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 11. CUSUM and CUSUMSQ for ARDL(4,0,0,1,0) SBIC and ARDL(4,0,3,1,0) AIC



4.1.12. Luxembourg

The analysis of Luxembourg data based on Augmented Dickey Fuller Phillips Perron tests revealed that Exchange rate and ESI are stationary and the remaining other variables are integrated order of 1 I(1) (Table 12.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The preliminary result of F-test using all the variables indicated that the result lies in the inconclusive region. F-Test result without interest rate is 4.97, which is higher than the upper bound of 4.57 from the Pesaran table (Table 12.B). This result clearly indicates cointegration relationships among the variables. In the subsequent analysis the study estimated the long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the result of the long term ARDL estimates, ESI, Relative Price and Dummy 2001 are statistically significant. The sign of ESI is positive as the hypothesis suggested and highly elastic with a value of 2.4. On the other hand, Relative Price has a positive sign and is not aligned with the hypothesis. Dummy 2001also has a positive sign and its estimated coefficient value was the highest in the selected countries of EU (Table 12.C).

Luxembourg is a member country of EU, uses Euro as a currency and follows EU monetary policies. Luxembourg might not able to adjust its own economy and trade balance as needed, this could explain part of the positive outcome in price instead of having a negative sign as suggested by economic theory. According to the significant and high value result of dummy D01, September 11 did not affect arrivals negatively. This finding is again attributed to the notion of positive "Safe Harbor" which confirms that Turkey is considered as a safe destination.

The coefficient of the error correction term is -0.006 and highly significant, suggesting that long term relations are valid among variables. This finding also implies that the imbalance created by the short term shocks adjust slowly about 0.6 % per period toward long term equilibrium (Table 12.D). Diagnostic tests and structural stability test results are presented in Table 12.D and Figure 12, respectively.

Table 12.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA ΔLNSTA	-1.692 -2.778*	-1.457 -2.566	I(1)
LNESI ΔLNESI	-2.591*	-2.989**	I(0)
LNINT ΔLNINT	-1.278 -3.619***	-0.887 -3.403**	I(1)
LNEX ΔLNEX	-2.805*	-5.510***	I(0)
LNRP ΔLNRP	-2.211 -6.856***	-2.318 -6.126***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 12.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
3.54	3.12	4.25	Inconclusive
	No LINT		
4.97	3.47	4.57	Yes

Table 12.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0) SBIC	ARDL(4,0,0,3)AIC
Variable	**Coefficient**	**Coefficient**
LESI	2.39** (1.12)	2.28** (1.09)
LNRP	1.08 (0.79)	0.66 (1.01)
LEX	2.18*** (0.79)	2.02*** (0.74)
C	-6.07 (5.09)	-5.53 (4.95)
D01	0.70*** (0.26)	0.67** (0.26)
D03	-0.40 (0.27)	-0.41 (0.26)

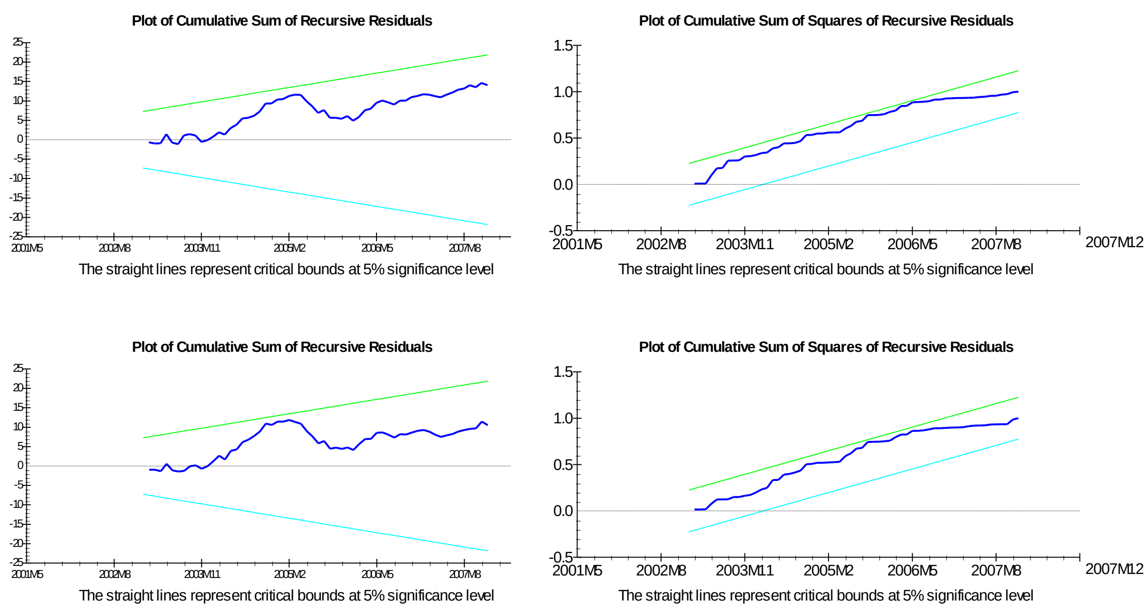
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 12.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0) SBIC	ARDL(4,0,0,3)AIC
Variable	**Coefficient**	**Coefficient**
ΔLSTA(-1)	2.343***	2.382***
ΔLSTA(-2)	-1.945***	-2.024***
ΔLSTA(-3)	0.564***	0.607***
ΔLESI	0.015*	0.014*
ΔLNRP	0.007	0.004
ΔLEX	0.014***	0.012
ΔD01	0.004***	0.004***
ΔD03	-0.002	-0.003
ecm(-1)	-0.006***	-0.006***
	Diagnostic Tests	
Test A	22.05 (0.04)	20.37 (0.06)
Test B	0.63 (0.43)	0.412 (0.52)
Test C	5.60 (0.06)	1.344 (0.51)
Test D	6.31 (0.01)	4.74 (0.03)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 12. CUSUM and CUSUMSQ for ARDL(4,0,0,0) SBIC and ARDL(4,0,0,3)AIC



4.1.13. Portugal

The analysis revealed that both ADF and P-P unit root tests indicate that Exchange rate is stationary and the remaining other variables are integrated order of 1 I(1) (Table 13.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The result of F-test is 14.06, which is higher than the upper bound of 4.25 from the Pesaran table (Table 13.B). This result clearly indicates cointegration relationships among the variables. In the subsequent analysis the study estimated the long run relationships and selection of the optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the result of the long term ARDL estimates, ESI and dummy D03 are statistically significant. ESI has a positive sign as the hypothesis suggested and elastic with a value of 1.3. This implies that 1 percent increase in Economic Sentiment Indicator could increase tourist arrivals by 1.3 percent. Dummy D03 is also positive with value of 0.14 (Table 13.C).

The coefficient of the error correction term is -0.07 and highly significant, there are two outcomes from this result. First, the result indicates that long-term relations are valid among the variables, secondly this implies that the imbalance created by the short term shocks adjust itself about 7% per period toward long term equilibrium (Table 13.D). Diagnostic tests and structural stability test results are presented in Table 13.D and Figure 13, respectively.

Table 13.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA	-0.069	-1.857	I(1)
ΔLNSTA	-5.383***	-3.425**	
LNESI	-2.045	-2.344	I(1)
ΔLNESI	-9.906***	-9.927***	
LNINT	-1.278	-0.809	I(1)
ΔLNINT	-3.619***	-3.403**	
LNEX	-2.805*	-5.510***	I(0)
ΔLNEX			
LNRP	-1.966	-2.187	I(1)
ΔLNRP	-6.981***	-6.067***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 13.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
14.06	3.12	4.25	Yes

Table 13.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,2,0,1,0) SBIC	ARDL(4,4,0,1,0) AIC
Variable	**Coefficient**	**Coefficient**
LNESI	1.284***	1.507***
	(0.367)	(0.335)
LNINT	-0.09	-0.099
	(0.079)	(0.069)
LNRP	-0.299	-0.198
	(0.442)	(0.386)
LNEX	-0.547	-0.495
	(0.359)	(0.119)
C	1.136	0.125
	(1.715)	(1.563)
D01	0.101	0.064
	(0.078)	(0.068)
D03	0.142*	0.118
	(0.082)	(0.071)

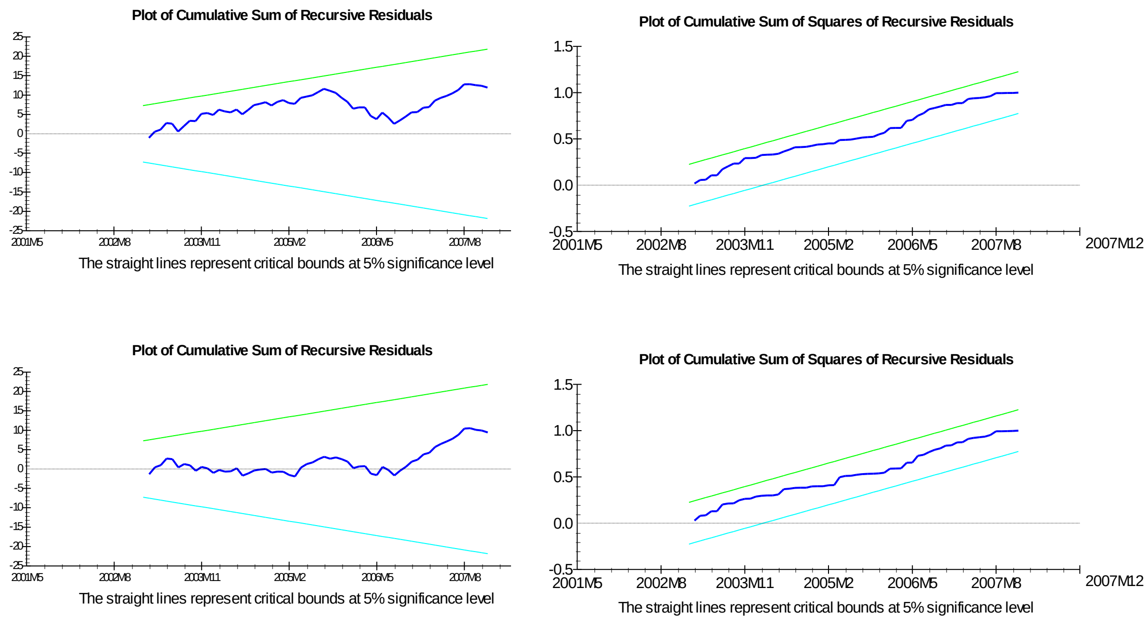
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 13.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,2,0,1,0) SBIC	ARDL(4,4,0,1,0) AIC
Variable	**Coefficient**	**Coefficient**
ΔLNSTA(-1)	2.166***	2.1361***
ΔLNSTA(-2)	-1.893***	-1.860***
ΔLNSTA(-3)	0.743***	0.749***
ΔLNESI	0.003	-0.002
ΔLNESI(-1)	-0.099***	-0.126***
ΔLNESI(-2)		-0.062
ΔLNESI(-3)		-0.069*
ΔLNINT	-0.006	-0.008
ΔLNRP	0.019	0.025
ΔLNEX	-0.037	-0.038
ΔD01	0.007	0.005
ΔD03	0.009*	0.009*
ecm(-1)	-0.068***	-0.077***
Diagnostic Tests		
Test A	24.185 (0.019)	22.917 (0.028)
Test B	10.326 (0.001)	11.515 (0.001)
Test C	2.210 (0.331)	1.617 (0.446)
Test D	4.482 (0.034)	3.428 (0.064)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 13. CUSUM and CUSUMSQ - ARDL(4,2,0,1,0) SBIC and ARDL(4,4,0,1,0) AIC



4.1.14. Spain

According to the results of unit root tests from Augmented Dickey Fuller and Phillips Perron all the variables are integrated order of 1 I(1) with the exception of the variable of Exchange rate, which is integrated order of 0 I(0) (Table 14.A). The next step in the analysis was to test the cointegration relation using Wald test (Joint significance F-Test) and comparing the result with the table from Pesaran (2001). The value of F-test result is 10.79 and higher than the result from the CI(v) at the 5% probability level from the Pesaran table (which is 4.25) (Table 14.B). This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. Optimal lags for both SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion) have found. Interest rate, Relative Price and Exchange rate are statistically significant. ESI and two dummy variables are not statistically significant. Interest rate is significant and has a negative sign similar to those of other countries included in the study. It seems that price is important factor for the visitors from Spain, according to the results 1 percent increase in Relative Price could decrease tourist arrivals by 2.8 percent. On the other hand, Exchange rate has a negative sign and is not aligned with the hypothesis (Table 14.C). Spain uses Euro as a currency and also part of the PIIGS (EU members with economic problems). Euro is not a country specific and the calculation of Exchange Rate includes common Currency “Euro”, which means Spain might not able to adjust its own economy and trade balance as needed, this could explain part of the negative outcome of the Exchange rate finding.

The coefficient of the error correction term is -0.07 and highly significant, suggesting that long-term relations are valid among the variables. This finding also implies that the imbalance created by the short term shocks adjust itself about 7% per period toward long term equilibrium (Table 14. D). Diagnostic tests and structural stability test results are presented in Table 14.D and Figure 14, respectively.

Table 14.A: Unit Root Tests Results: ADF and P-P

Variables	**Augmented Dickey Fuller (ADF)**	**Phillips Perron (P-P)**	**Decision**
LNSTA	-0.674	-0.903	I(1)
ΔLNSTA	-3.360**	-3.456**	
LNESI	-2.564	-3.029	I(1)
ΔLNESI	-11.266***	-12.041***	
LNINT	-1.278	-0.809	I(1)
ΔLNINT	-3.619***	-3.403**	
LNEX	-2.805*	-5.510***	I(0)
ΔLNEX			
LNRP	-2.230	-2.440	I(1)
ΔLNRP	-6.988***	-6.133***	
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 14.B: F-Test Results

F-Test	**Table CI(v) at 5% Level**		**Cointegration**
	I(0)	*I(1)*	
10.79	3.12	4.25	Yes

Table 14.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,0,0,0,1) SBIC	ARDL(4,0,3,1,0) AIC
Variable	**Coefficient**	**Coefficient**
LNESI	-0.457	-0.971
	(1.037)	(1.045)
LNINT	-0.287***	-0.303***
	(0.092)	(0.087)
LNRP	-2.790***	-2.888***
	(0.429)	(0.404)
LNEX	-2.499***	-2.609***
	(0.338)	(0.333)
C	11.487**	13.848***
	(4.863)	(4.894)
D01	0.048	-0.0009
	(0.073)	(0.071)
D03	0.001	-0.043
	(0.090)	(0.086)

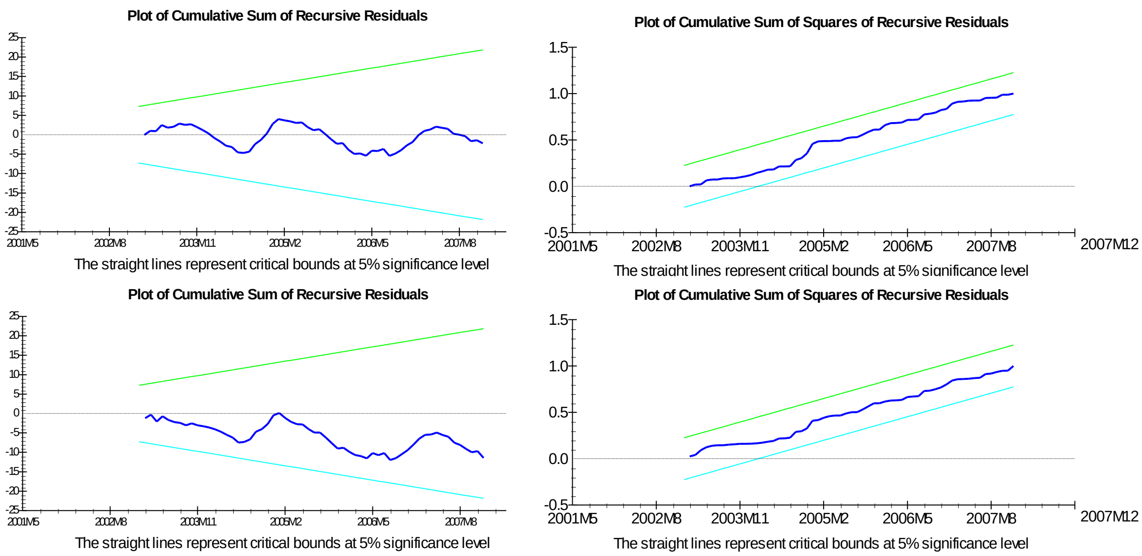
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 14.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,0,0,0,1) SBIC	ARDL(4,0,3,1,0) AIC
Variable	**Coefficient**	**Coefficient**
ΔLNSTA(-1)	2.182***	2.192***
ΔLNSTA(-2)	-1.974***	-1.989***
ΔLNSTA(-3)	0.815***	0.0832***
ΔLNESI	-0.032	0.069
ΔLNINT	-0.020***	-0.006
ΔLNINT(-1)	-	0.041
ΔLNINT(-2)	-	-0.142***
ΔLNRP	-0.195***	-0.101**
ΔLNEX	-0.291***	-0.184***
ΔD01	0.003	-0.0006
ΔD03	0.000	-0.003
ecm(-1)	-0.070***	-0.071***
	Diagnostic Tests	
Test A	19.491 (0.077)	17.681 (0.126)
Test B	20.278 (0.000)	20.190 (0.000)
Test C	14.654 (0.001)	4.909 (0.086)
Test D	6.508 (0.011)	3.931 (0.047)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 14. CUSUM and CUSUMSQ for ARDL(4,0,0,0,1) SBIC and ARDL(4,0,3,1,0) AIC



4.1.15. Sweden

The analysis of Sweden data based on Augmented Dickey Fuller and Phillips Perron tests revealed that all the variables are integrated order of 1 I(1) except the variable of Exchange rate which is integrated order of 0 I(0) (Table 15.A). The cointegration relation using Wald test (Joint Significance F-test) showed that the value of F-test is 8.66 and higher than the result from the CI(v) at the 5% probability level obtained from the Pesaran table (Table 15.B) This indicates that there are long term cointegration relationships between tourist arrivals and at least one of the variables. The next step was to estimate long run relationships and selection of optimal lags for the variables of the ARDL model using SBIC (Schwartz Bayesian Information Criterion) and AIC (Akaike Information Criterion). According to the long term ARDL estimates, ESI, Interest

Rate and dummy D01 are statistically significant. Economic Sentiment Indicator has a positive sign and is aligned with the hypothesis, and also elastic, ranging from 1.9 to 2.3 depending on the lag structure of the model. The sign of Interest rate is negative as the hypothesis suggested and is inelastic with a value of -0.3 (Table 15.C). ESI has the correct sign and is not affected by the use of Euro as a currency, which confirms earlier explanations regarding the control of currency. Also similar to findings in the previous countries, the results of dummy D01, September 11 did not appear to have affected arrivals negatively which confirms our “Safe Harbor” approach; this result implies that visitors from Sweden consider Turkey as a safe vacation destination.

The coefficient of the error correction term is -0.04 and highly significant. The inferences are that long-term relations are valid and exist among the variables and that the imbalance created by the short term shocks adjusts itself about 4% per period toward long term equilibrium (Table 15.D). Diagnostic Tests and structural stability test results are presented in Table 15.D and Figure 15, respectively.

Table 15.A: Unit Root Tests Results: ADF and P-P

Variables	Augmented Dickey Fuller (ADF)	Phillips Perron (P-P)	Decision
LNSTA ΔLNSTA	-1.304 -3.165**	-0.949 -3.464**	I(1)
LNESI ΔLNESI	-1.591 -4.697***	-1.316 -8.833***	I(1)
LNINT ΔLNINT	-1.167 -3.989***	-1.899 -4.284***	I(1)
LNEX ΔLNEX	-2.700*	-5.283***	I(0)
LNRP ΔLNRP	-1.384 -7.168***	-1.463 -6.231***	I(1)
*** 1% Critical Value, **5% Critical Value, *10% Critical Value			

Table 15.B: F-Test Results

F-Test	Table CI(v) at 5% Level		Cointegration
	I(0)	*I(1)*	
8.66	3.12	4.25	Yes

Table 15.C: Long Run ARDL Estimates of Coefficients

	ARDL(4,2,0,0,0) SBIC	ARDL(4,3,0,0,0) AIC
Variable	**Coefficient**	**Coefficient**
LNESI	1.946***	2.335***
	(0.684)	(0.750)
LNINT	-0.300***	-0.283***
	(0.052)	(0.054)
LNRP	0.549	0.860*
	(0.423)	(0.492)
LNEX	0.047	0.257
	(0.289)	(0.337)
C	0.366	-1.447
	(3.163)	(3.473)
D01	0.359***	0.390***
	(0.094)	(0.099)
D03	0.104	0.103
	(0.084)	(0.083)

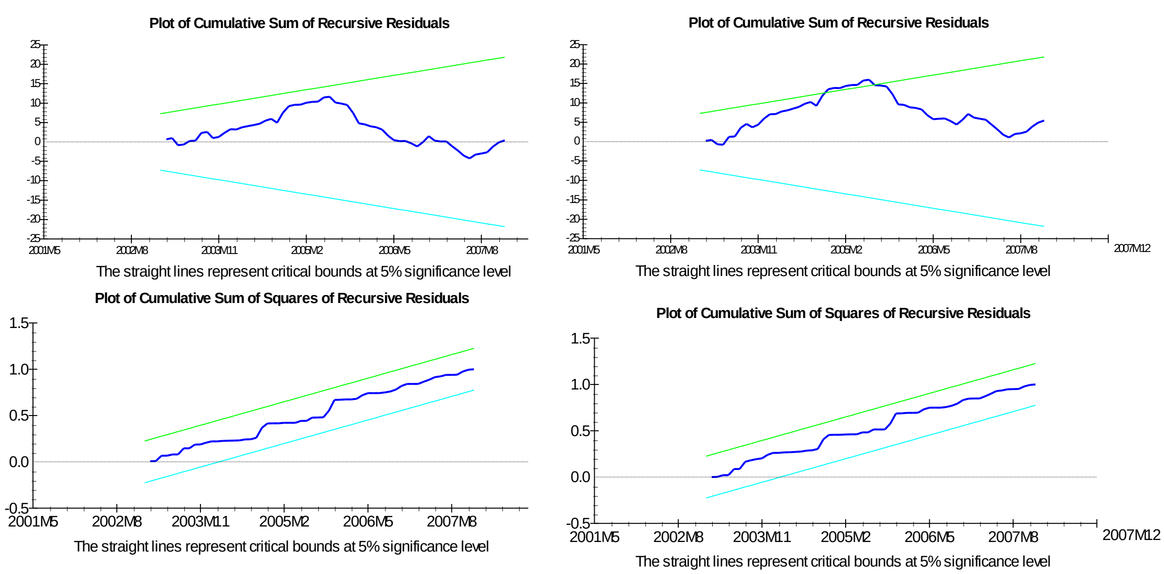
Note: Significance Levels denotes as follows ***(1%), **(5%), and *(10%).

Table 15.D: Short Run ECM Estimates and Diagnostic Tests Results

	ARDL(4,2,0,0,0) SBIC	ARDL(4,3,0,0,0) AIC
Variable	**Coefficient**	**Coefficient**
ΔLNSTA(-1)	2.292***	2.282***
ΔLNSTA(-2)	-2.151***	-2.142***
ΔLNSTA(-3)	0.875***	0.873***
ΔLNESI	0.002	0.003
ΔLNESI(-1)	-0.081***	-0.097***
ΔLNESI(-2)	-	-0.043
ΔLNINT	-0.012***	-0.011***
ΔLNRP	0.022	0.034*
ΔLNEX	0.002	0.01
ΔD01	0.014***	0.016***
ΔD03	0.004	0.004
ecm(-1)	-0.040***	-0.040***
Diagnostic Tests		
Test A	22.680 (0.031)	22.804 (0.029)
Test B	2.755 (0.097)	1.639 (0.201)
Test C	0.865 (0.649)	1.094 (0.579)
Test D	0.267 (0.605)	0.038 (0.845)

Test A-D are LM Serial Correlation, Ramsey's Reset Test, LM Normality, LM Heteroscedasticity respectively.

Figure 15. CUSUM and CUSUMSQ for ARDL(4,2,0,0,0) SBIC and ARDL(4,3,0,0,0) AIC



CHAPTER FIVE: CONCLUSION AND IMPLICATIONS

The main objective of this thesis was to develop a model of tourism demand that incorporates Economic Sentiment Indicator as a demand determinant along with more conventional variables. In order to delineate a tourism demand function from the selected countries of EU, the study utilized such econometric models as ARIMA and ARDL Bound test approach to cointegration.

The result from Wald test (F-Test) indicated that 13 out of 15 countries had cointegration relationships; France and The Netherland did not show any cointegration relationships among the variables. The general findings for all the countries are presented in Table 16.

Table 16: Overall Results of Tourism Demand by Country

	LESI	LINT	LRP	LEX	C	D01	D03
Austria	-1.258**	-0.183***	0.016	-	16.047***	0.101	0.087
Belgium	0.381	-0.237**	-0.419	-0.255	8.491***	0.182**	-0.044
Denmark	0.058	-0.352***	-0.126	-0.138	9.192***	0.216**	-0.006
UK	0.852*	-	0.890*	0.814*	7.653***	0.397**	-0.051
Finland	-1.205*	-0.265**	-0.203	-0.703	13.566***	0.239**	-0.091
Germany	-0.617*	-0.201***	-0.022	-	15.274***	0.089	-0.004
Greece	-0.623	-0.703***	-0.676**	-	10.851***	0.076	-0.052
Ireland	0.615*	-0.349***	-0.996**	-0.882***	5.814***	0.073	0.202**
Italy	0.611	-0.175	-0.377	-0.386	7.012	0.107	-0.305*
Luxemburg	2.498***	-0.503***	-0.597	-	-5.541	0.542***	-0.191
Portugal	1.284***	-0.09	-0.299	-0.547	1.136	0.101	0.142*
Spain	-0.457	-0.287***	-2.790***	-2.499***	11.487**	0.048	0.001
Sweden	1.946***	-0.300***	0.549	0.047	0.366	0.359***	0.104

Note: 1) *** shows significance at 1% or better probability; ** shows significance at 5% probability level; and * shows significance at 10% probability level.
2) Estimated coefficients represent elasticities of the included variables except Dummy variables.

Hypothesis 4 proposes that interest rate negatively affects tourist arrivals. Interest rate was used as an independent variable in 12 countries except UK. The variable was statistically significant in 10 out of 12 countries and had an expected sign, negative sign as proposed by the study hypothesis. European Central Bank enforces common interest rates for all EU countries no matter how they grow, if a given country is growing very fast it can increase interest rate to lower growth rate thus eliminating future hyperinflation, or lowering interest rate, if the growth is slower, but as a member country of EU, there is no control anymore. Second effect from the interest rate is that, it could be expensive to borrow for visitors if they need to finance their trips. Additionally, higher interest rates would mean prospective visitors might prefer to invest their vacation money while better investment opportunities around and spend it in the future.

Hypothesis 3 proposes that exchange rate positively affects tourist arrivals. There were only 3 countries that had statistically significant results for exchange rate, UK, Ireland, and Spain. Exchange rate coefficient was positive for UK and negative for Ireland and Spain. Negative results from Ireland and Spain did not support hypothesis 3. European Union members use Euro as a currency, when a common currency is used, countries cannot devaluate their currency to become more competitive and/or use inflation to decrease the amount of money they borrowed. This might be the reason for the negative outcome for Ireland and Spain. UK uses own currency which is positive as proposed by the hypothesis, which confirms this hypothesized relationship.

Hypothesis 2 proposes that Relative Price negatively affects tourist arrivals. Relative Price is statistically significant for UK, Greece, Ireland, and Spain. The sign of Relative price is negative for Greece, Ireland, and Spain. The findings from these countries with respect to price support hypothesis 2. Visitors from UK might not consider the variable of price very important in destination selection or this finding may be attributed to the notion of safe harbor effect which is explained in the next section.

Hypothesis 1 proposes that Economic Sentiment Indicator (ESI) positively affects tourist arrivals. ESI is statistically significant in 8 countries, Austria, UK, Finland, Germany, Ireland, Luxembourg, Portugal, and Sweden. Three of those countries (Austria, Finland and Germany) had a negative coefficient and five had a positive sign as proposed by the hypothesis.

There could be several possible reasons related to the negative sign of the estimated coefficient from those three countries. First, higher interest rates could create budget constraints even if there is higher ESI, which means, visitors might be willing to go to Turkey but they might not able to afford it because of the budget constraints. Second, Euro is not a country specific currency, all the countries with the negative estimated coefficients use Euro as a common currency, not able to control own currency could create problems even with higher ESI. The third explanation could be attributed to the notion of "Inferior Good" approach. If origin countries consider Turkey as an "Inferior Good", which means if visitors from such countries feel better about their economic conditions they might think that they can afford other more expensive locations, if not, they might prefer Turkey as a destination, this could explain the negative sign of ESI. Lastly and most probable approach is the notion of "Safe Harbor" approach. Especially after September 11 destination selection criteria have changed, safety became very important consideration. If visitors considers Turkey as a safe place to visit, comparing to other destinations that might create a "Safe Harbor" effect. This approach has been confirmed by positive dummy D01(September 11 effect), there are six statistically significant results and all are positive, which implies that there are more people willing to come to Turkey. Table17 simply presents a summary of hypothesis testing by country.

Table 17. Hypothesis Results by Origin Country

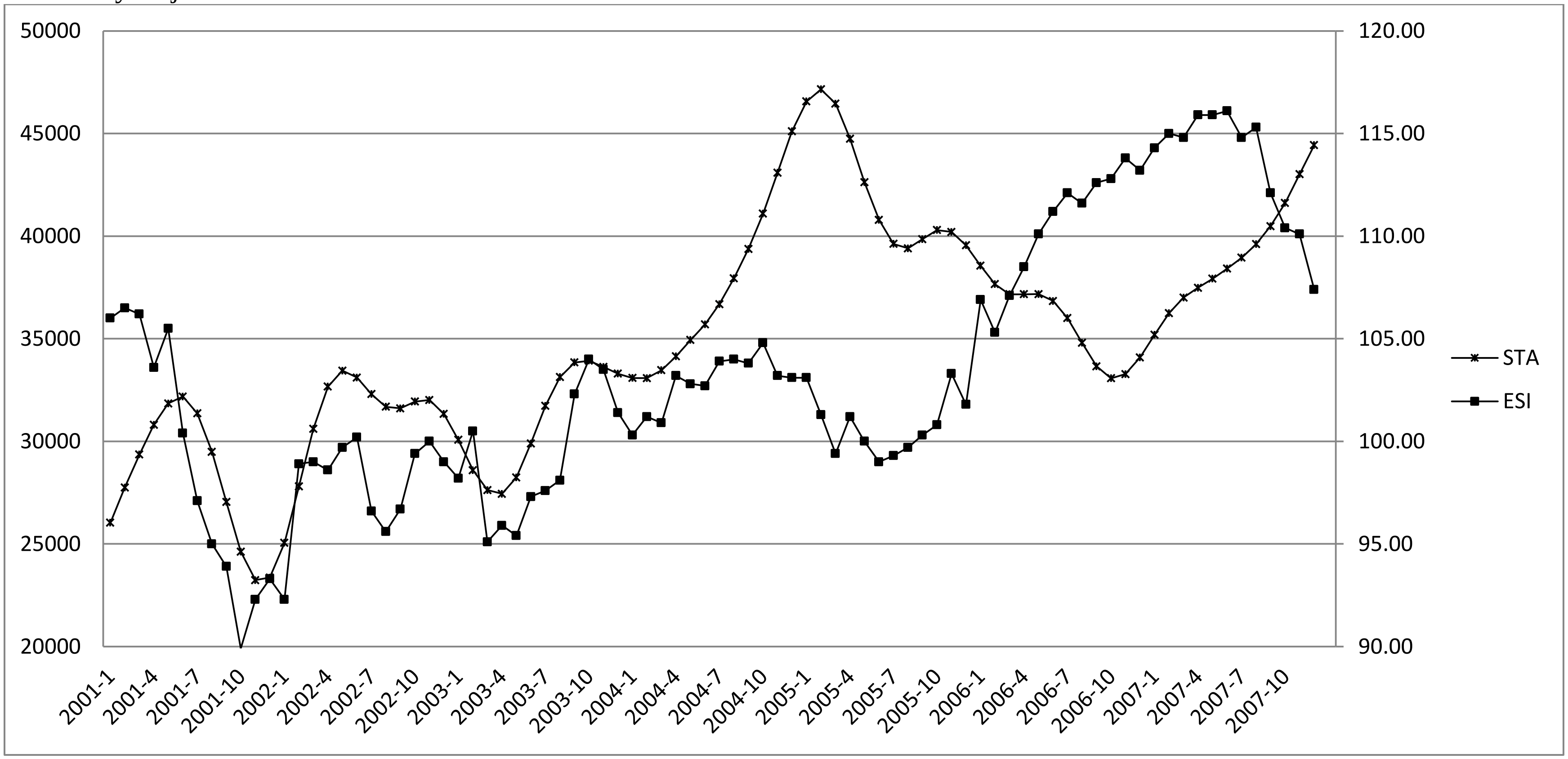
	Support	Do not Support	General Result
Hypothesis 1	UK, Ireland, Luxemburg, Portugal, Sweden	Austria, Finland, Germany	Partially Supported
Hypothesis 2	Greece, Ireland, Spain	UK	Partially Supported
Hypothesis 3	UK	Ireland, Spain	Partially Supported
Hypothesis 4	Austria, Belgium, Denmark, Finland, Germany, Ireland, Luxemburg, Spain, Sweden		Supported

It is also important to mention that the study did not differentiate between business and leisure travelers. The dependent variable of arrivals in this study includes both business and leisure travelers. However, the majority of visitors come to Turkey in package tours. Some of the results in relation to some countries may have been influenced by the nature of tourism product to Turkey, namely being part of the all-inclusive package tour.

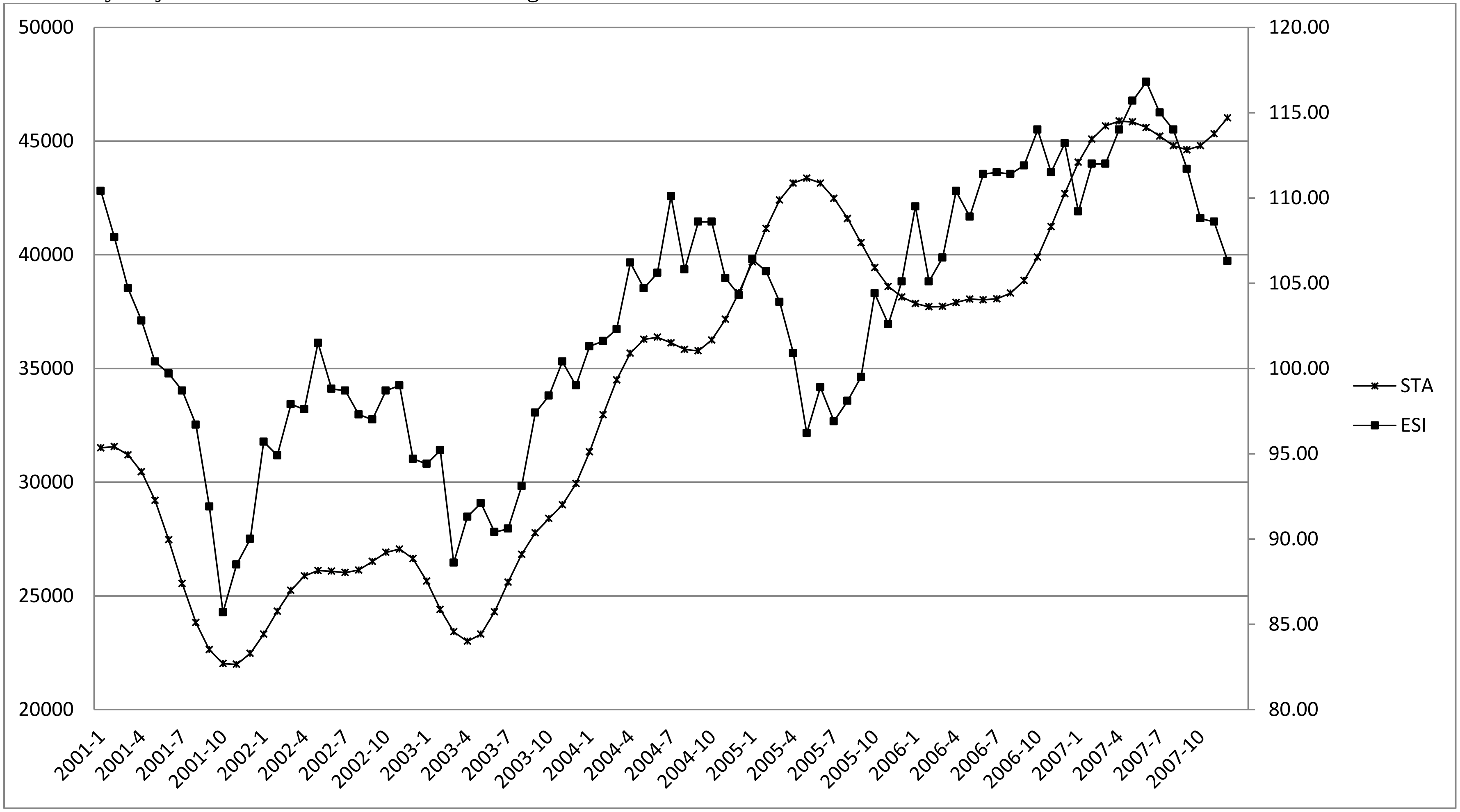
The study posits that Economic Sentiment Indicator is a good indicator to gauge and monitor tourism demand and adding the visitors' state of mind into the demand equation could reduce errors and increase variance in arrivals. Policy makers should monitor ESI as it fluctuates over time. We do not have direct influence on travelers or their demand for tourism so it is imperative that we use indirect approaches such as price adjustment and creating new packages or promotional expenditures in order to influence or induce demand. Using this information generated from the study, government officials and tourism suppliers could adjust their promotional activities and expenditures in origin countries accordingly.

APPENDIX: Seasonally Adjusted Tourist Arrivals vs. ESI

Seasonally Adjusted Tourist Arrivals vs. ESI: Austria

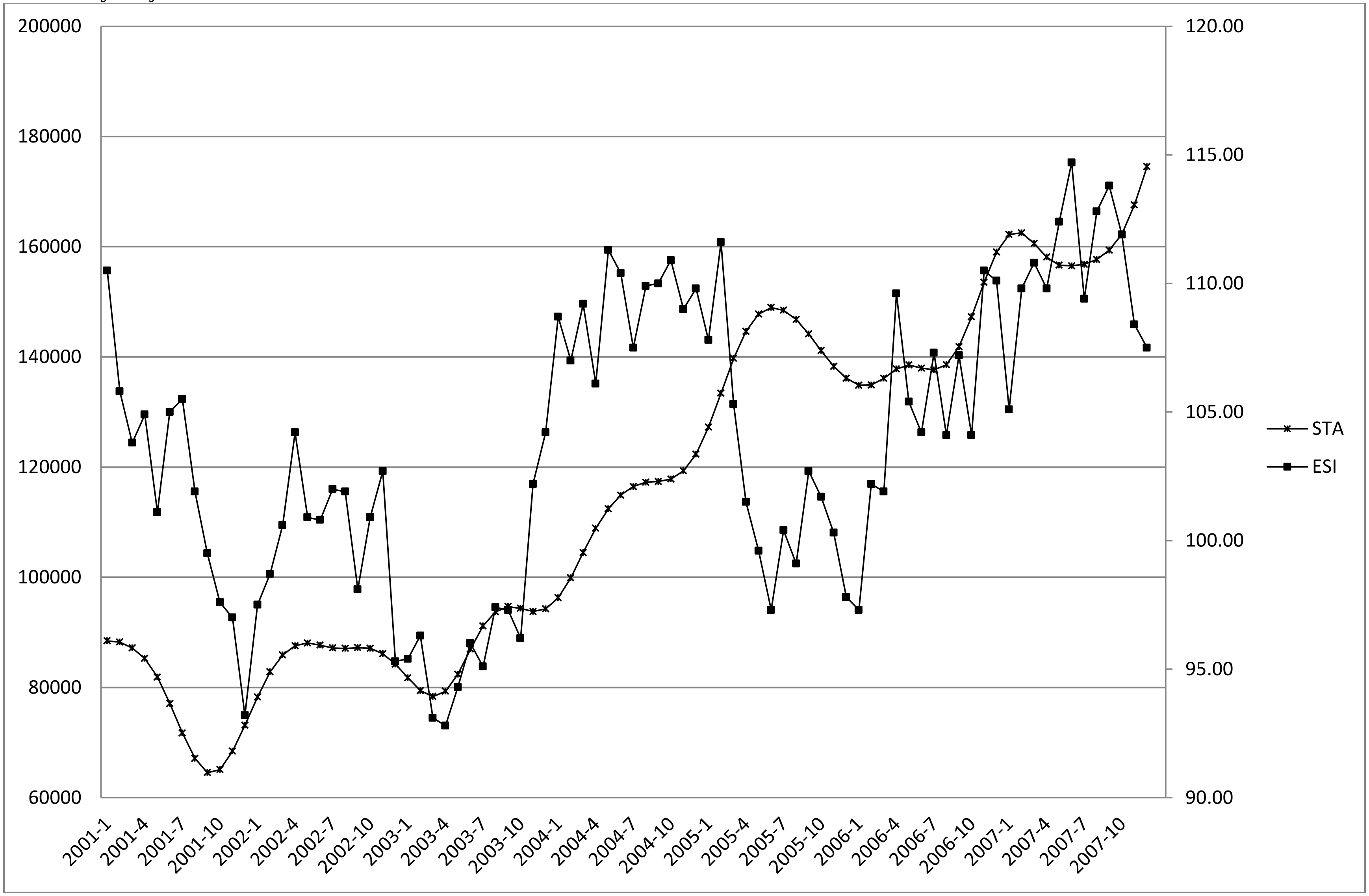


Seasonally Adjusted Tourist Arrivals vs. ESI: Belgium



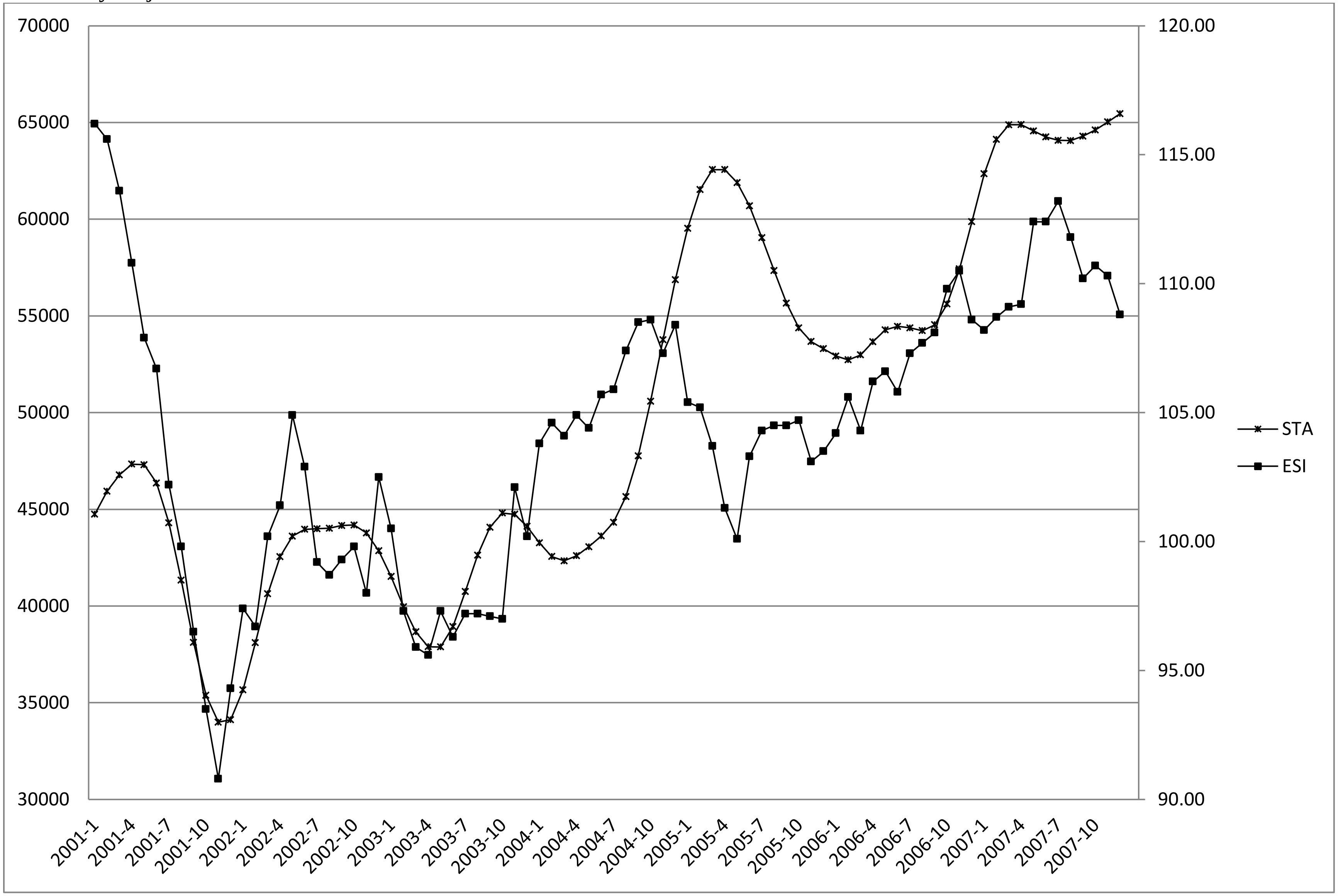
Seasonally Adjusted Tourist Arrivals vs. ESI: Denmark

Seasonally Adjusted Tourist Arrivals vs. ESI: UK



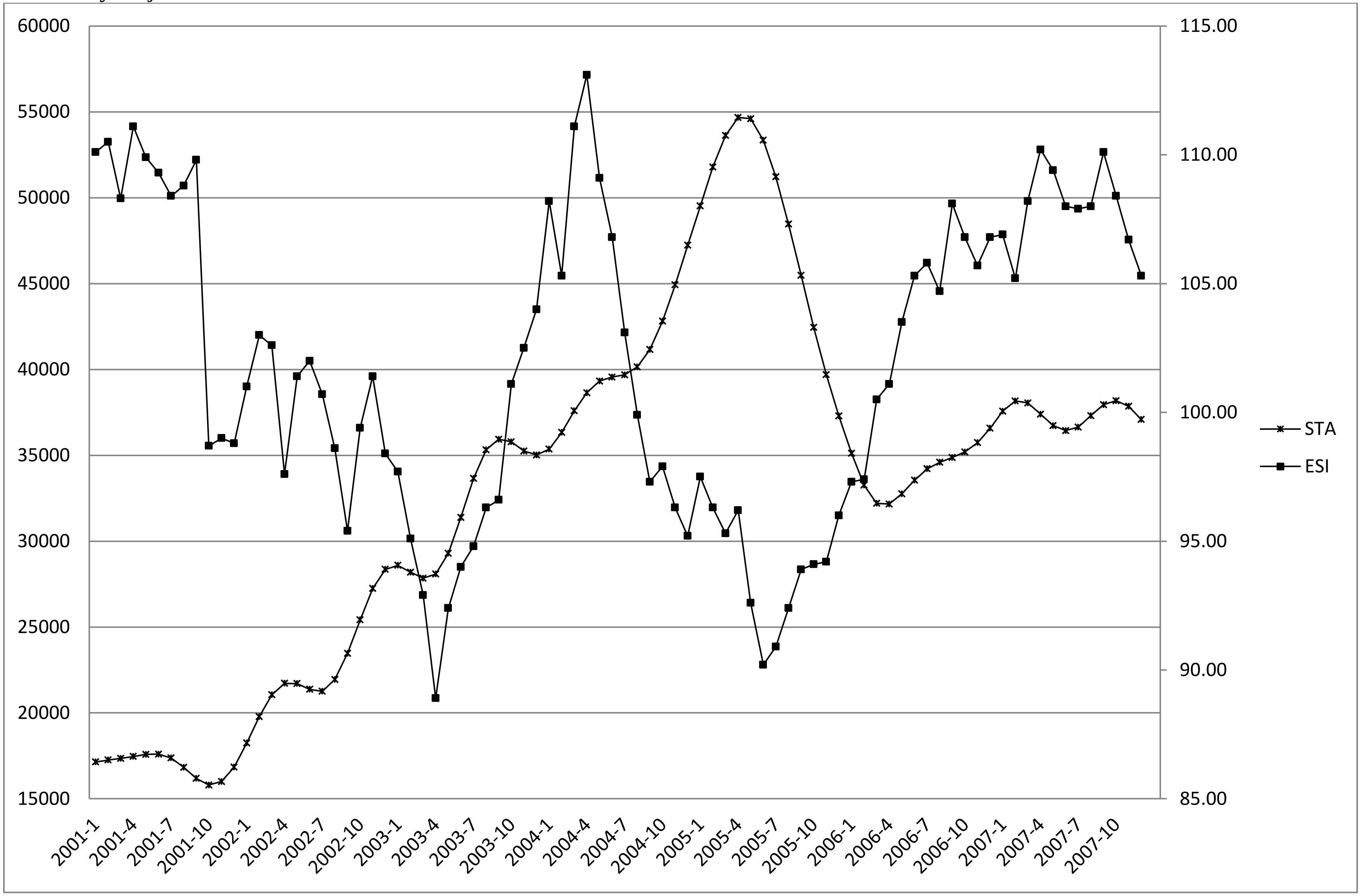
Seasonally Adjusted Tourist Arrivals vs. ESI: Finland

Seasonally Adjusted Tourist Arrivals vs. ESI: France



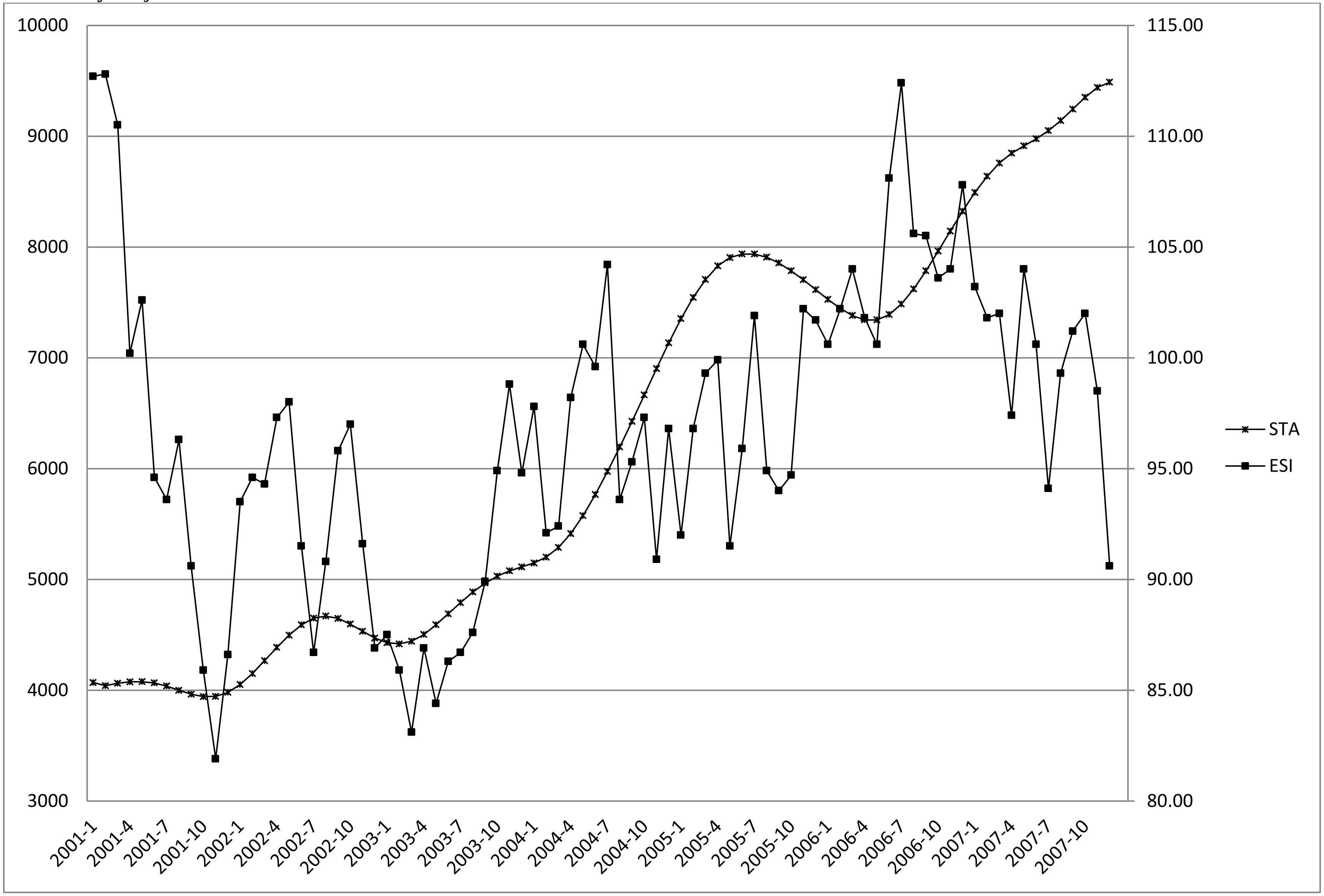
Seasonally Adjusted Tourist Arrivals vs. ESI: Germany

Seasonally Adjusted Tourist Arrivals vs. ESI: Greece

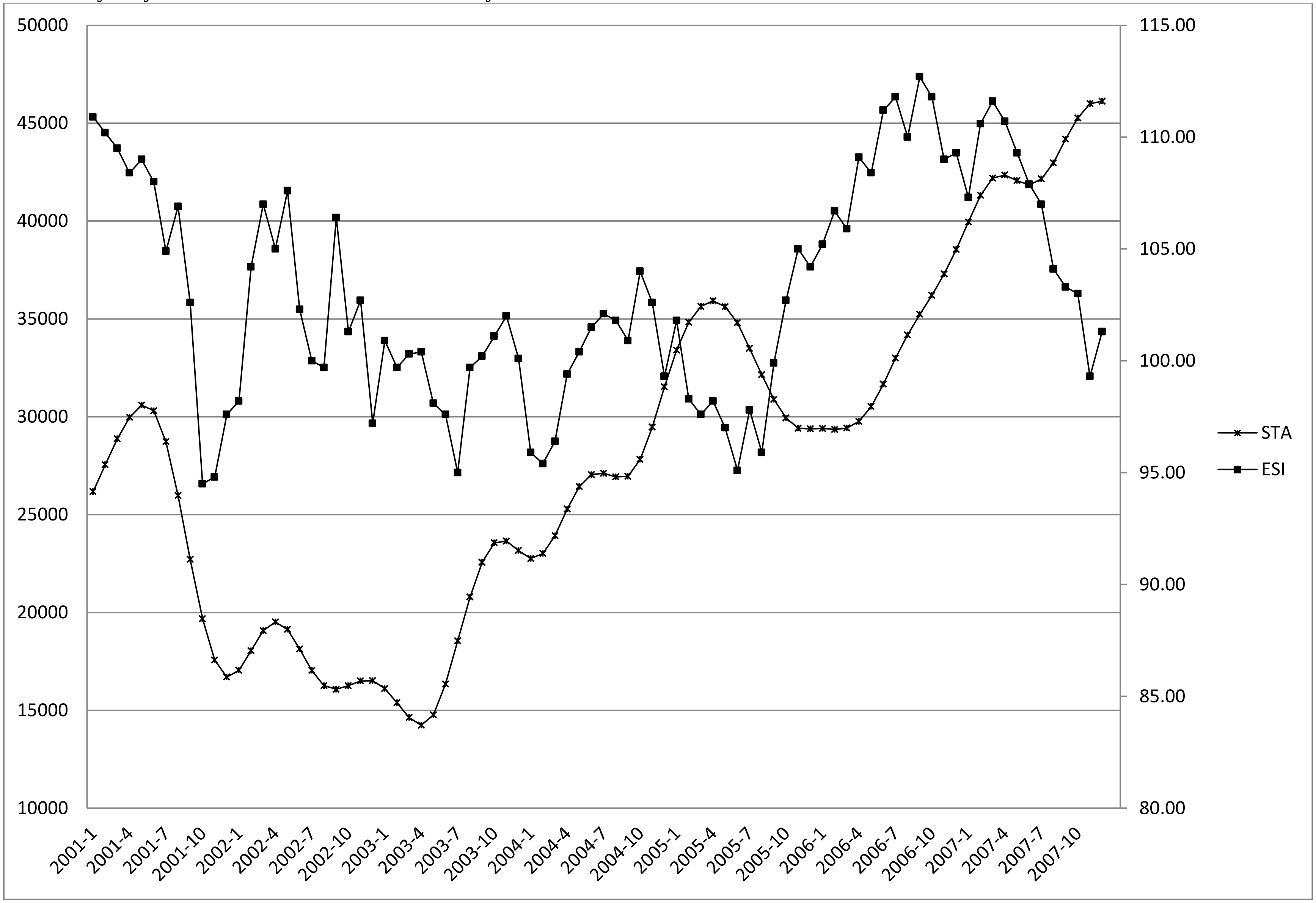


Seasonally Adjusted Tourist Arrivals vs. ESI: The Netherland

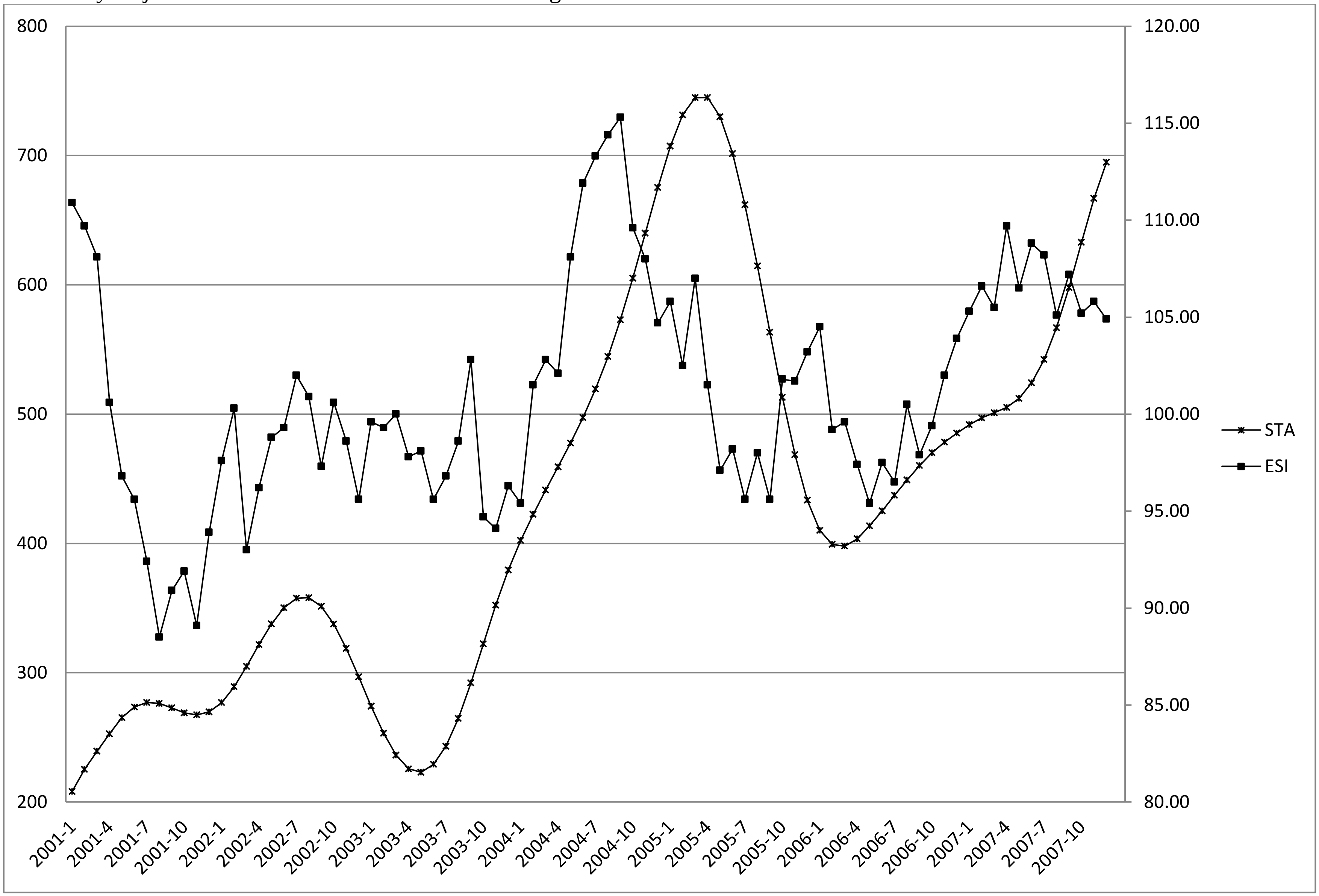
Seasonally Adjusted Tourist Arrivals vs. ESI: Ireland



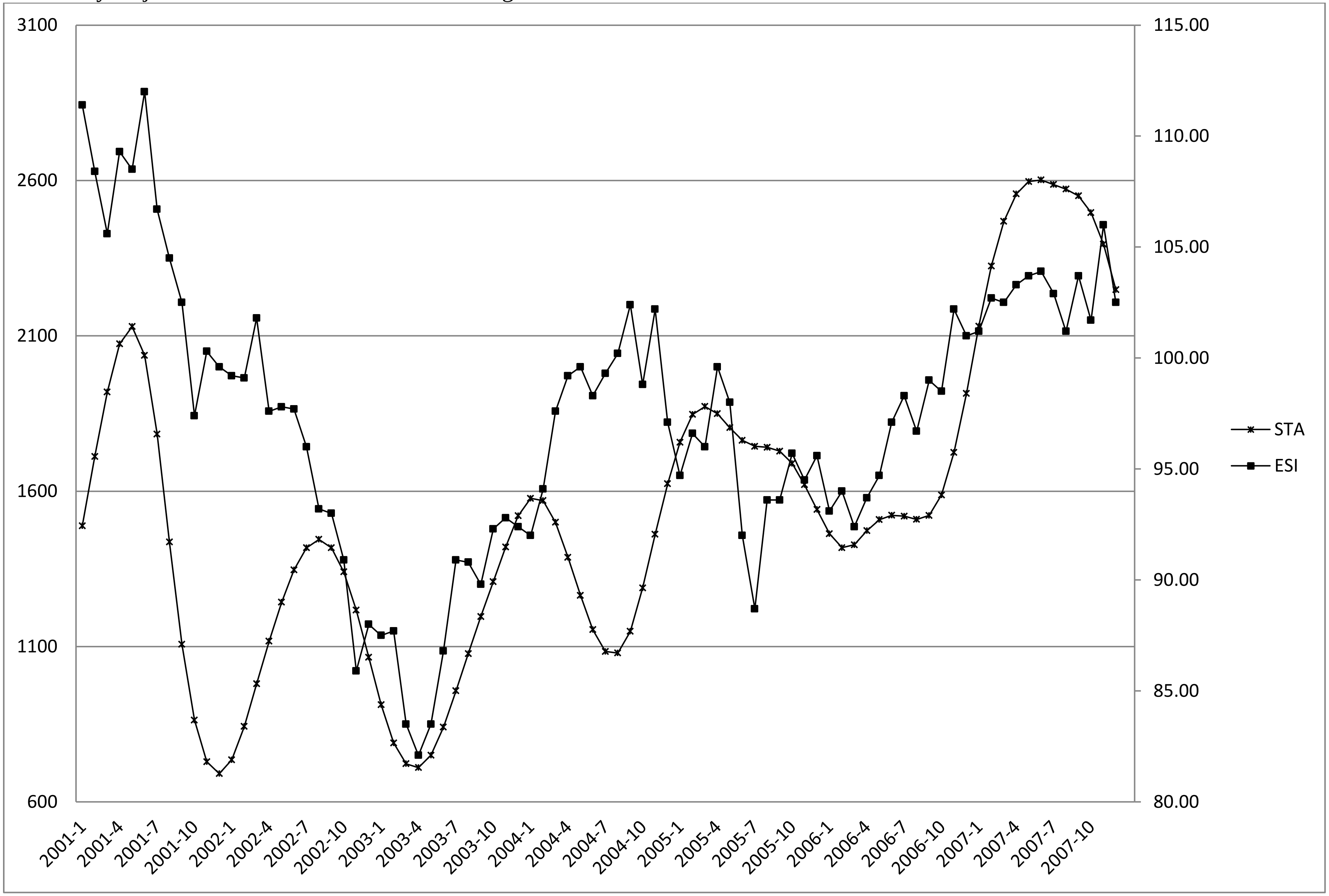
Seasonally Adjusted Tourist Arrivals vs. ESI: Italy



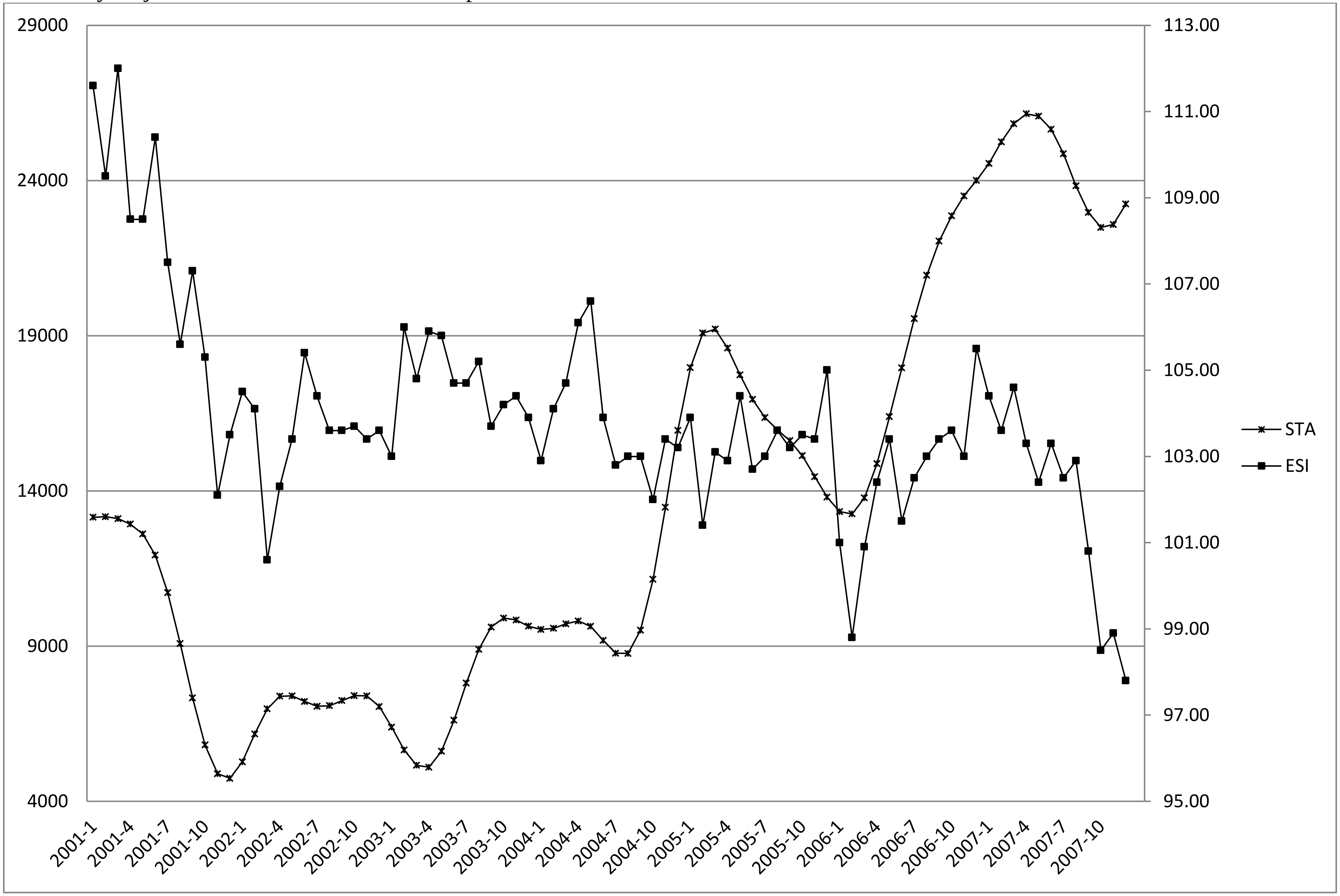
Seasonally Adjusted Tourist Arrivals vs. ESI: Luxemburg



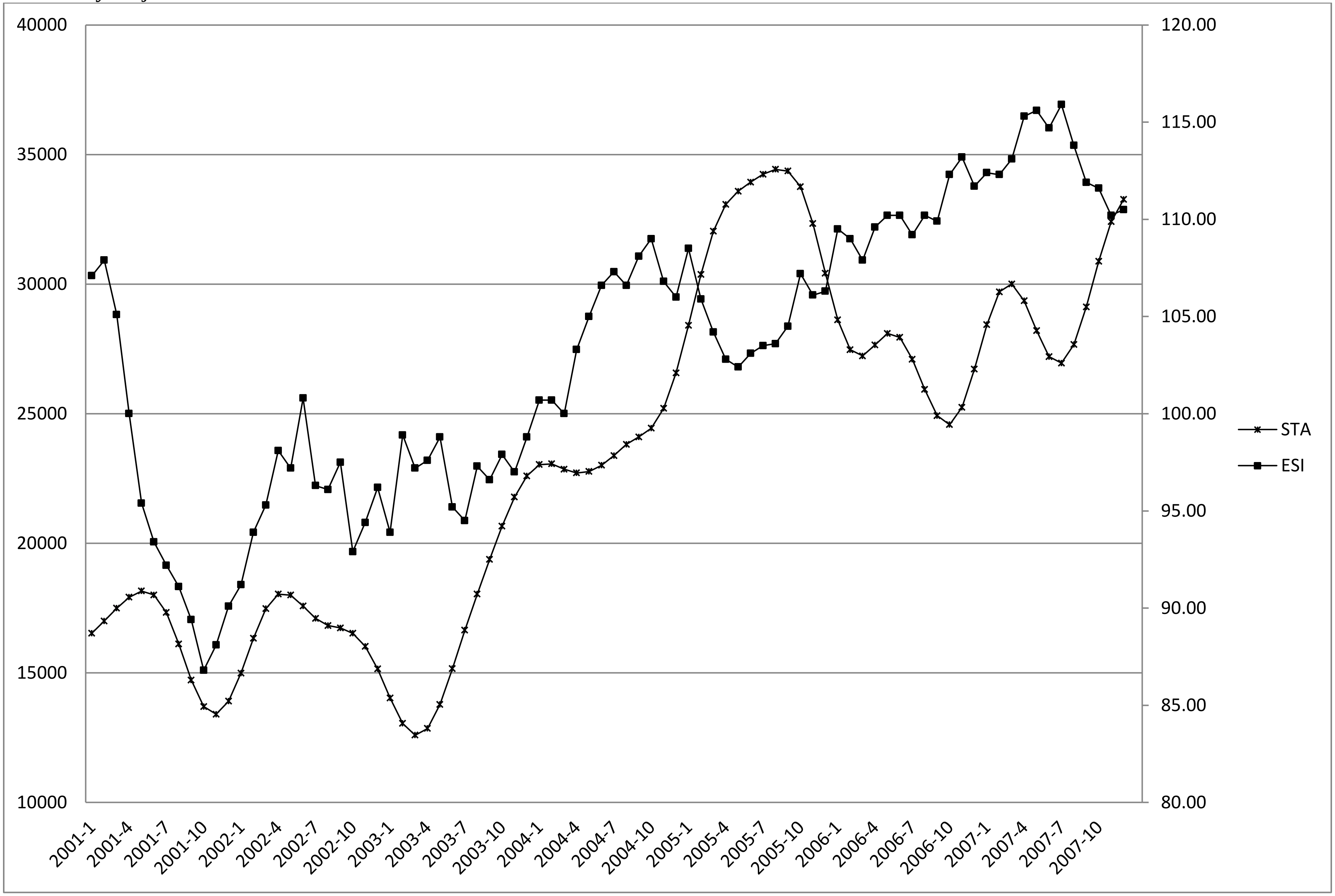
Seasonally Adjusted Tourist Arrivals vs. ESI: Portugal



Seasonally Adjusted Tourist Arrivals vs. ESI: Spain



Seasonally Adjusted Tourist Arrivals vs. ESI: Sweden



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