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Tourism Trends and Patterns: What are the Determining Factors?

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TOURISM TRENDS AND PATTERNS: WHAT ARE THE DETERMINING FACTORS?

by

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ABSTRACT

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Travel and tourism stimulates economic growth, investment and foreign trade. Almost 1/6 of the world's population traveled to an international destination in 2005. Annual data show that international tourist arrivals are continuing to grow, but what variables determine where tourists decide to travel? The ideas of many past studies were examined to decide which variables to consider for my model. This study used a particular set of five destination countries as proxies for the five regions categorized by the World Tourism Organization. This allows the economic model to capture any area-specific characteristics. Data from over 150 origin countries are used to test if travel trends to these specific destinations are area-specific. The variables tested in this study, to determine what factors may have contributed to the growth of international arrivals, include GDP per capita, distance, population, population density, and exchange rates. There is a focus on the September 11th terrorist attacks on the United States. Through econometric analysis, I have found GDP per capita and distance to be robust determinants, implying that tourism forecasting should heavily rely on these factors. The population, population density, and exchange rate variables are significant for some destination countries but not all, implying these are site-specific variables. This thesis provides insight into tourism forecasting; destination countries can use this knowledge to try and promote tourism to countries where the leading variables will play a significant role.

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CHAPTER ONE

Introduction

The world has become much smaller and accessible. The global environment which used to be intimidating is now reachable seemingly by the push of a few computer buttons. In the new world economy, all people of all nations are now on a more level playing field, competing for the consumer's dollar. The world is becoming a much smaller place with electronic connections making information from the four corners immediately available. The new mind set has all the world economies vying for success in what is becoming a highly competitive global marketplace. Understanding and relating all of the variables that go into determining where tourist dollars go and then being able to extrapolate this information into projections of future spending would be incredibly valuable. This paper seeks to find out which factors most directly relate to tourism trends and how these factors can be used to forecast future tourism flows.

How do tourists choose where to travel? "Traveling to a foreign country is a relatively large expenditure for most households, yet it is often not easy to know in advance exactly what the product is going to be like; in this sense it is more like a medical treatment than, say, car purchase." (Johnson and Thomas, 1993) There is a risk in choosing your travel destination if you have not traveled there previously. One person's praise of a destination does not guarantee all other tourists will have the same feelings. How can we gain knowledge on a topic that is subjective and dependent on the experiences one has at a particular destination? This question is what makes this thesis topic difficult to answer, in that everyone *does* have their own opinion as to why they

travel to a particular destination country, which makes it difficult to comprehensively predict tourism trends.

Travel services and tourism bring significant income to the destination country. The economies of many destination countries depend on visitor expenditures on accommodations, food, shopping, etc to bring in revenue and foreign currency. Nearly one sixth of the world's population traveled to an international destination in 2005. (WTO, 2007) International tourism arrivals have grown from 536 million arrivals in 1995 to 806 million arrivals in 2005, which is a 150% increase over an eleven year span! (WTO, 2007) During this eleven year period international tourist arrivals to Europe grew from 311 million arrivals in 1995, to 439 million in 2005, travel in Asia and the Pacific enlarged from 83 million to 155 million, the Americas expanded from 109 million to 133 million, Africa developed from 20 million to 37 million, and the Middle East advanced from 14 million to 38 million (WTO, 2007). It is interesting to note that during this time period, specifically 2002, Asia and the Pacific surpassed the Americas in terms of international tourist arrivals to become the second largest region behind Europe. Clearly, some regions have grown more than others during this time frame, and this paper seeks to determine the factors that cause these region variations in international tourism trends.

Understanding whether internationally arriving tourists react to certain factors has ramifications far greater than just knowing how long the lines will be at tourist hot-spots. To get an idea of the impact of the tourism sector, the Bureau of Economic Analysis calculates the sales impact of tourism, for the United States, direct sales within the tourism industry in 2005, which includes everything from accommodation to travel tickets to recreations totaled over $611 billion, or 5% of total GDP (BEA, 2007). It

would be useful to know which factors are involved in the tourism industry of the host country so that revenues can increase total GDP to an even greater magnitude.

It is difficult to try and predict basic human actions, as every human perceives things differently. While the notion of finding the underlying principles that motivates people to travel may not seem difficult, it must not be forgotten that there are cultural differences that interfere with the process. These cultural differences may cause fluctuations in tourism patterns; one country's tourism may be explained by one explanatory variable, whereas another destination country may not be affected by the same variable.

Studies in the past regarding tourism trends tend to focus on either one destination country or a group of neighboring destination countries. Up until now, studies have been site-specific not regional, and found it impossible to extrapolate findings for the various sections of the world. It is evident that a world view and concept is on the horizon. This thesis asks the following question: what are the determining factors of international tourism trends and patterns? More specifically, are these patterns evident on a global scale or do some factors only affect certain regions? This initial macroscopic study uses five representative countries from different continents to represent global trends. If more time was allotted, this study could have been expanded to represent more destination countries.

There is a need from an economic stand point for a global tracking and predicting system for tourist arrivals. The tourism industry has been continuing to grow, and research as to what causes tourism to certain countries to grow more than others would be extremely useful for forecasting and policy purposes. That is, a means of forecasting

tourism trends could help destination countries market to their applicable demographic. This would create a more efficient marketing expenditure.

This thesis considers five destination countries (China, Egypt, Italy, Morocco, and the United States) from five different regions and tests to see how international arrivals to each country react to the following explanatory variables: real GDP per capita, distance, population, population density, and real exchange rates. Are tourism trends universal or dependent on the destination country? If the trends vary, are there any explanatory variables that are robust and significant in all cases?

The organization of this thesis is as follows. Chapter two provides a review of the existing literature regarding trends in tourism, international tourism demand, tourism forecasting, and the effect of terrorist attacks on tourism demand. Chapter three provides a description of the data set and describes the econometric models used in this analysis. Chapter four presents the results of this econometric analysis, and Chapter five concludes the thesis.

CHAPTER TWO

Review of Literature and Concepts

The purpose of this chapter is to provide a summary of previous research to explain international tourism trends. This chapter contains area of research on trends in tourism, international tourism demand, tourism forecasting, and the effect of terrorist attacks on tourism demand. These background sources provide insight as to which factors help determine tourism trends and what patterns have been developed in the past.

2.1 Areas of Research on Trends in Tourism

Previous research has been conducted by the World Tourism Organization to track the trends in the tourism industry. The WTO (2007) produces annual reports containing data by region (Europe, Asia and the Pacific, Americas, Africa, Middle East) and sub-region to show the performance of each region in comparison to the previous year's statistics. All five regions have had positive average annual growth from 2000-2005 with the Middle East experiencing the most growth of 10.1% (WTO, 2007). Many destinations rely on inbound tourism as an important pillar of their economy. "Some 70 countries earned more than US$ 1 billion from international tourism in 2005" (WTO, 2007). The changes in international tourism arrivals and receipts are recorded. Europe holds the largest share of receipts, holding 51.2% of all international tourism receipts in 2005 (WTO, 2007). A further in-depth analysis is conducted based on major destination countries within the regions and trends are recorded for these major destinations. China and Turkey have shown development in terms of growth over the past decade. Trends on

outbound tourism show that the majority of travelers travel within the same region. The top international tourism spenders are calculated based on tourism expenditure receipts. Germany has held this top position for the past two years in which it surpassed the United States as the leader of this category.

While the World Tourism Organization presents these annual reports, it does not include information about long term international tourism trends. Fletcher (1997) assembles data on international tourism from 1950-1994 to illustrate how some of the trends and indicators relevant to tourism activity have shifted over the years. Eight tables are collected and the paper shows how tourism activity has continued to grow through 1994, with the number of arrivals reaching 537 million and tourism receipts US$ 341 billion. International tourism receipts were the fastest growing element of international trade in 1992 and 1993, with annual growth rates of 14.3% and 1.1% respectively. At a regional level, East Asia had the strongest annual growth rate over the period 1989-1994 with arrivals growing at 10.6% and receipts at 12.9%. The United States continues to be the world's top tourism earner with receipts of US$ 60.4 billion. There has been sensational growth in China, moving from 30th in 1985 to 10th in 1994. The USA is ranked first as the world's top spender, with Germany following closely in second with spending of US$ 43.6 and 41.8 billion respectively. Recognize that in 1994, USA was ranked first and Germany second, but from the WTO above the positions have been switched in recent years. Taiwan illustrates that the East Asia Pacific region has also shown strength as a tourist generator moving up from 17th to 10th place in the spending list. Visitors for the USA, in spite of spending the most as a whole in 1994, were only ranked 8th in terms of spending per trip. Visitors from Japan spend the highest per trip at

US$ 2,262. The future shows a continued shift in market share from the more mature destinations to the newer, more vibrant region of East Asia and Pacific.

All eight tables show figures related to tourism growth, patterns, and trends. The findings show how these tourism trends correspond with economic performance and portray how the two are closely related. Tourism is continuing to grow and in turn providing revenue for the destination countries. The countries that continue to grow at a fast pace should expect to see tourism revenues increase. The tables are all compiled on data based from one source: the World Tourism Organization. While this source is very reliable, there may be more statistics available that could provide information for later years. While this data is very comprehensive, it is out-dated as its most recent data is from 1994.

The OECD (2006) tries to find what procedures need to be taken to help promote tourism growth in the future. While in developing countries tourism is frequently a motor for rapid growth, a number of the developed countries face growth problems. This raises a question that is not easy to answer: Is this result inevitable in countries that have been transformed into high-tech service economies? New destinations are successfully competing against the traditional tourism countries, which in many cases have exhausted existing resources and the potential for 'newness'. "The relentless process of globalization, together with liberalization and the extension of the international tourism market led to unexpected losses of market share for the developed tourism countries" (OECD, 2006, p 18). Thanks to a lower level of development the new tourism countries have benefited from temporary competitive advantages in the form of lower wage costs and favorable exchange rates. Destinations can go "out of fashion" as it is the market

that decides whether or not the destination is worth a visit. Tourists choose destinations that they find attractive and which offer the greatest utility.

Tourism depends to a great extent on the natural and man-made attractions around which destinations have developed. This dependence of attractions limits the potential for product innovation in destinations. Geographical specificity is intrinsic to the product and cannot be "reinvented" just anywhere. Downhill skiing requires suitable sites in high mountains. Local destinations cannot simply reposition themselves in the market at will. Thus the number of attractions within a country does not change as it is the environment that provides these attractions. Tourism development "depends on a large number of exogenous factors including the source market potential, accessibility and the related transportation costs and the existing attractions at a given place" (OECD, 2006, p 36). The challenge for the future is to provide increased value for money either through innovation-driven changes in production and marketing processes that reduce costs or product changes that offer more varied tourism experiences for quality conscious customers. Natural resources are particular to a specific region which contributes to their allure, such as surfing Hawaii's waves or skiing in the Alps. Similarly, man-made things have this same feature such as the Eiffel Tower is peculiar only to Paris.

Producing and marketing tourism products are not the same as producing and marketing industrial products. The differences are as follows: "tourism produces and sells product bundles (or 'experiences') which are very intangible; its products cannot be stored (simultaneous production and consumption); the consumption of tourism products involved the active participation of the customer; tourism production/marketing may often involve major capital assets (airlines, hotel chains, car rental firms); the

intermediation, distribution and final consumption stage may often require interaction of different personnel categories (e.g. travel agencies, restaurants, coaches, etc.)" (OECD, 2006, p 56). In today's saturated markets customers looks for "experiences" rather than destination specific products.

2.2 Areas of Research on International Tourism Demand

Crouch and Shaw (1993) integrate the findings from 44 other studies of international tourism demand and compares how factors in one study relate to the whole realm of tourism patterns based on the findings of the other studies. Numerous studies have been performed to develop an understanding of the factors that determine tourism demand, but nothing has been developed to comprehensively integrate these findings, which is what this study attempts to do. Harrop (1973) has suggested that the high growth in international tourism has been "mainly the outcome of both a high income elasticity of demand and a high price elasticity", whereas other researchers feel that there are many other factors that have contributed to this growth, including urbanization, population, education, and leisure time. Other factors such as rising incomes and declining costs of transportation have also contributed to the expansion of international travel.

Although each study has individually made a contribution to the field, their impact on a comprehensive understanding of the issue has been somewhat limited. It is difficult to generalize regarding this area as research, methodologies, results, and the specific topics studied usually vary from one study to another. There may be good reasons for these variations, for example, different tourism markets may attract customers

with very different economic characteristics. "This research examined empirical estimates of a wide variety of demand coefficients, and investigated a large number of factors, representing differences between studies, which may account for the varied findings" (Crouch and Shaw, 1993, p 104). Crouch and Shaw seek to answers Johnson and Ashworth's question of whether demand coefficients differ significantly as a function of the origin and destination countries studies and that is what Crouch and Shaw attempts to answer.

Crouch and Shaw examine the variations in estimated elasticities of demand in international tourism as a function of the origin and destination country pairs analyzed in each of the previous studies. "It has long been presumed that the responsiveness of demand of international tourism would vary depending upon the nationality of the tourists concerned as well as the specific destination involved" (Crouch and Shaw, 1993, p 104). For example, cultural differences provide a good reason for believing that different nationalities would respond differently to changes in the cost of transportation, or to increase the promotional efforts of destinations to attract visitors. While it is likely to find that estimated demand elasticites for international tourism do vary by country-of-origin and country-of-destination it would be useful to know how demand elasticities vary; "which origins will cut back their international travel behavior most during an economic downturn; which markets are likely to respond most to promotions; which destinations are most susceptible to cross-price effects (whether competitive or complementary); how changes in the cost of travel are likely to favor some destinations over others; and so on" (Crouch and Shaw, 1993, p 110).

Other studies, on the basis of cultural differences, have discovered the behavior of tourists is likely to be a function of their country of origin. For example, Japanese tourists like to travel in groups whereas Germans prefer to travel individually. Residents of large countries are likely to be more price sensitive since they have a wider variety of tourism experiences within their own boundaries. Harrop (1973) suggests that income elasticity for the major tourist generating countries is likely is to higher.

Turning now to destination-country effects, past studies show the importance of competitive and complimentary relationships between destinations. Price competitiveness should vary as a function of the uniqueness of the destination. A higher price elasticity is likely to the extent that a destination competes with other destinations. A lower price elasticity would be expected for more differentiated destinations. The sensitivity of demand to exchange rate changes may also vary by destinations. For example, the devaluation in the less developed countries is likely to have little impact on demand.

Crouch and Shaw discover that most studies are dominated by Western Europe and North American travel. Economic factors are the leading variables used (i.e. income, relative prices, cost of transportation and exchange rates) yet some studies try to examine market variables as well (i.e. population, climate, government spending). Empirical results vary considerably so generalizations can not be possible without a comprehensible statistical analysis. The most frequently examined variables are income and relative prices, followed by disturbances, cost of transportation, exchange rates and marking expenditure.

The results of this study indicate some promising findings but also show that further investigation is still required. "While they have provided useful results for the specific circumstances investigated, any attempt to generalize results across studies has been frustrated by the considerable variability in empirical findings, the limitations of the traditional approaches to the integration of results, and the small number of studies examined" (Crouch and Shaw, 1993, p 116). This study does answer Johnson and Ashworth's (1990) question that estimated demand coefficients are indeed situation-specific, that is, their value depends upon the pair of countries of interest. The findings of this study show that further research is needed to understand tourism trends and more recent empirical studies could be included.

In the following year, Crouch (1994a) produced another study which attempts to compile a comprehensive review of literature focused on international tourism demand (defined as expenditure/receipts, arrivals/departures, nights, average length of stay, and other) and present them in a systematic way for convenient reference. These studies show the structure of empirical testing to determine how tourism trends have been calculated in the past. "Over the past 30 years total international tourist flows have grown by a factor of six, to approximately 400 million" (Crouch, 1994a, p 41). Tourist receipts depend on both the demand and supply side of tourist services and the determinants depend on the structure of the tourism decision (where, when, how, etc.). A collection of studies has been constructed to determine what methodology, dependent variables, and independent variables are most commonly used. The objective of the article is to provide a comprehensive list of empirical studies that had attempted to

evaluate the determinants of international tourism demand and to outline the approach of each study.

The methodologies used vary and the most important methodological dimensions include the nature of the demand coefficient, the functional form, the type of data, whether a single of simultaneous equation approach was adopted, and the ways in which multicolinearity and serial correlation were managed. Multiple regression is the most common form of econometric forecasting. Data in the form of time-series has typically been used, which enables modeling of trends. Cross sectional analysis investigates changes in the patterns across countries is less useful for forecasting purposes but is used to investigate different types of factors (Crouch, 1994a).

Demand variables should represent the quantity of the product demanded but with the tourism sector this is difficult because "the dependent variable is an aggregate of several separate activities definable in money terms and not quantity as in the conventional way of defining such coefficients" (Crouch, 1994a, p 43). Thus, measuring tourism demand is problematic since in real money terms it represents both an amount of expenditure and the quality of consumption. It is often preferable to use real money terms but this data is often not available. Data on tourist numbers is generally more reliable but it is less responsive to determinants.

The selection of appropriate variables depends on the number of factors, including the countries examined, the time-period investigated, and the type of tourism involved. "Vanhove (1980) defined four mutually exclusive groups of explanatory variables: (1) the market element represents factors determining the overall number of trips; (2) the destination element includes attributes of the destination that would attract or deter

tourists; (3) the location element defines the geographical relationship between the destination and the market; (4) the ties element includes factors that represent business, cultural, and other links between countries" (Crouch, 1994a, p 43). It is important to realize that the definition of these variables can be misleading. There are a multiple of ways that factors such as income, price, travel cost, and so forth can be defined (i.e. normal or real, per capita or separate variable for population, absolute or relative price).

Crouch (1994a) finds that ordinary least-squares (OLS) multivariable regression analysis has been the most widely used approach, with approximately 84% of the studies using this method. In terms of demand variables, 63% of the studies observed the number of tourist arrivals and departures as the measure of demand while other studies (48%) examined the amount of expenditures and receipts. The independent variables employed in the studies seem to show similarities across studies. "Measures of income (employed in 89% of the studies), the price of tourist goods and services (both own-price and cross-price effects) (70%), the cost of transportation (58%), and exchange rates (33%) dominate the research history" (Crouch, 1994a, p48). More than half of the studies introduce dummy variables (54%) such as political factors, travel restrictions, special events to account for various disturbances that may have biased the estimated parameters had they been ignored. Other variables if interest includes marketing effort, population, cultural ties, and distance/travel time. Variables of minor interest include weather and climate, supply factors, tourist appeal, barriers to travel, lagged variables, and anticipatory effects.

This article set out to provide guidance to other researchers interested in undertaking other similar studies. The selection of the most suitable approach will depend

upon the circumstances and objectives of the study being planned. This survey is useful for my research question as it gives insight as to which variables and methods have most frequently been used in the past to help determine international tourism demand trends.

Crouch (1994b) continues his research and further attempts to review the findings of the same set of studies used in the pervious article. Here, Crouch tries to answer: Are the most common methods and variables necessarily the best ones to use? How do other variables affect the outcome of these common ones? Economic theory suggests that price and income related variables will play a key role in determining the demand for international tourism.

After reviewing the studies, Crouch (1994b) finds that income is the single most important determinant of demand for international tourism and is given the greatest explanatory power. All studies have considerable difficulty in deciding on the measure of price as it includes "foreign currency price of tourist goods and services in destinations, the cost of transportation between countries, and the effect of exchange rate variations on purchasing power" (Crouch, 1994b, p 13). Commonly, price has been expressed as a ratio of prices in the destination to prices in the origin country. The inclusion of exchange rates as an explanatory variable is not clear cut due to the relationship between exchange rates and the relative inflation rates. "The Economist Intelligence Unit [EIU] identified the impacts of an unfavorable change in exchange rates to include (1) less travel abroad, (2) travel to different locations, (3) a reduction in expenditure and/or length of stay, (4) changes in the mode or time of travel, (5) a reduction of spending by business travelers" (Crouch, 1994b, p 12). Similar reverse effects were recognized by a favorable exchange rate.

Cost of transportation represents the foremost hurdle before any tourism decision is made. Air fare may deter some potential visitors not to go to a destination at all if it wipes out expected consumer surplus from a visit. It is difficult to measure the cost of transportation as there are different modes and types of travel and "it is not surprising that numerous studies rejected any attempt to account for variations in the cost of transportation" (Crouch, 1994b, p 14). As for the studies that did incorporate cost of transportation as a variable, there has been no reasonable estimate of the impact of transportation costs. "Multicolinearity between rising real incomes and falling real transportation costs, particularly the cost of air travel, has frequently resulted in the dropping of transportation cost from the model" (Crouch, 1994b, p 14).

There are other variables that only a few studies have introduced but are shown to be insignificant and thus it is difficult to interpret the results. Only a few studies have estimated the impact of marketing on demand due to the lack of relevant data. Those that did include marketing found mixed results. The modeling of a time-trend was considered to separate the effects of changing tastes from other causal variables. The conclusions vary from weak to moderately strong. Dummy variables have been included in many of the studies to account for special events. While these variables were included in some of the studies they do not play a large role in determining tourism demand.

Other factors such as lagged effect and the nature of competition have been reviewed. The effect of promotion and marketing might be lagged but in general the results suggest that the effect of income is not lagged. "A number of studies have simply lagged relevant explanatory variables by one of more time increments. This method is somewhat crude in that it still assumes that the full impact is confined to a single time

increment, albeit different, from the time increment associated with the change in the independent variable" (Crouch, 1994b, p 16). Also, the majority of studies implicitly assume that all countries are competitive destinations to a greater or lesser extent but that closer destinations are more likely to be complementary.

It can be concluded that the empirical results vary across the set of studies and it is very difficult to reach any definitive conclusion. This research cannot adequately reveal the underlying nature of the relationships between demand for international tourism and its determinants as people's tastes evolve and the underlying conditions change. Yet, this article does assist in determining which variables should be used for my thesis.

2.3 Areas of Research on Tourism Forecasting

One of the purposes of research on tourism demand is to improve the ability to forecast. The need for accurate forecasting in the tourism industry is heightened by the perishable nature of the product. If forecasts of tourism demand are too high, then it is likely that in general capital investment will be excessive, the labor force will be too big, and excess stocks will be held of goods normally sold directly to, or used by, tourists. Thus, for example, there may be empty seats on airplanes, unoccupied hotel rooms, and unused taxi cars. If an airline seat is not filled it cannot be stockpiled and used for a later time; the revenue lost from the sales of the unused airline seat is lost forever. If, on the other hand, forecasts of tourism demand are too low, then firms will lose opportunities; for example, there may be insufficient hotel accommodation or too few flights to cater all those wishing to visit a certain area at a given time (Witt, 1993).

Witt and Witt (1995) review the empirical findings on tourism demand forecasting and evaluates the accuracy of tourism forecast generated by various models. "The challenge is to examine if it is possible to say, with a reasonable level of certainty, whether there will be more or fewer tourist visits next year than this year so that operators in the tourism industry at least receive an indication as to whether to plan for an increase or decrease in demand" (Witt and Witt, 1995, p 465). If tourism demand has been rising steadily for several years, is this likely to continue or when will a downturn begin to occur?

Forty studies, also used by Crouch and Shaw (1993) in the previous section, are compiled and compared to determine which factors determine tourism trends. Noted variables that play a role in determining tourism demand as defined as the number of tourist visits or in terms of tourist expenditures are population, income, the cost to travel to the destination, the cost of living for the tourist in the destination, exchange rates, substitute prices, dummy variables, trend (popularity of a destination country), marketing, habit persistence, and 'word of mouth' recommendations. Only one study uses population as a variable and it appears that multicolinearity between population and income may well be a problem in this model (Witt and Witt, 1995).

While there are many techniques available to forecast tourism demand, there are only a few of these techniques that are commonly used. Examining the studies that have taken place over the last thirty years helps make is possible to show these forecasts but do not create a concrete answer to forecast tourism trends. "It is not possible to build a single model which is appropriate for all origin-destination pairs. Certain explanatory variables influence tourism demand for some origin-destination pairs but not others, and

the estimated coefficients also vary considerably across tourist flows" (Witt and Witt, 1995, p 469). The no change model most accurately measures the forecasting of tourism demand. Thus, the practitioner should just use last year's demand as the forecast for this year, i.e. assume no change for one year forecasts. The autoregressive model proved to be strong and should be used for forecasts of two years or more.

Witt and Witt (1995) show which factors play a role in determining tourism trends and how these trends help forecast tourism demand in the future. While my thesis is not concerned about tourism forecasting, Witt and Witt (1995) provide insight as to what variables play a key role in determining tourism travel. There are certain variables that show up in many of the 40 studies examined while other variables are used infrequently. While those used infrequently should not be discarded, the most important variables are usually those used most often.

Organizations have attempted to put together expensive forecasts of international tourism demand to sell to the tourism industry. Witt (1993) examines two forecasting services, (ITTF) *International Travel and Tourism Forecast* by Brooke, Buckley, and Witt (1985) and the TRAM (Travel Analysis Model) forecast and tests to see how well the complex expensive models used by the two forecasting organizations perform relative to simple cheap models. The accuracy of tourism forecasts has been stressed in the past and it could be the case that the services that managers of the tourism industry are paying for these forecasts are not justified. These two forecasts are compared to:

Naïve 1: The forecast for period t+1 is equal to the actual number of visits in period t:

$V_{t+1} = V_t$, called 'random walk' model.

Naïve 2: The forecast for period t+1 is equal to the actual number of visits in period t multiplied by the growth rate over the pervious period:

$$V_{t+1} = V_t \{1+ ((V_t - V_{t-1})/V_{t-1})\}.$$

Absolute percentage errors are calculated for each forecast value, where the mean absolute percentage error (MAPE) is also collected.

The ITTF model outperforms N1 in 56% of the cases, but the MAPE for the ITTF model is smaller than the MAPE for N1 in only one out of four cases. A comparison of the ITTF forecasting model with the 'no change growth rate' N2 model shows that the forecasting performance to the ITTF model is relatively good. The fact that the random walk model out-performs the TRAM model for 69% of the destinations is a poor reflection on the forecasting accuracy of the latter model. The TRAM model out-performs N2 in terms of absolute percentage for individual destinations in 67% of cases (Witt, 1993).

The forecasts of international tourism demand published by the two tourism forecasting services considered are at best of a similar level of accuracy to those produced by a random walk model, and may be considerably worse. The empirical results obtained support previous findings by Martin and Witt (1987) which show that the random walk model is ranked more highly in terms of forecasting accuracy than causal models in the context of international tourism demand (Witt, 1993). This paper illustrates how simple models can be used to forecast tourism trends rather than expensive complex models. Since I do not have the means or time to compile such an elaborate forecast, creating a simple forecast as a substitute should be sufficient and yield similar results.

2.4 Areas of Research on the Effects of Terrorist Attacks on Tourism Demand

Terrorism can hinder the tourist sector by keeping tourists away after major terrorist attacks. Not only does tourism demand decline after an attack, tourists often choose to travel to other destinations which they may perceive to be safer to minimize their risk of being involved in a terrorist incident. **"**Fear and insecurity about the possibilities of terrorism affect tourism demand, even when, in fact, deaths and injuries from terrorism are statistically insignificant – less likely to occur than being struck by lightening or killed in an accident on the roads at home" (Pizam, 2000, p 125). Buccola and Fleischer (2002) find that the magnitude of the downward shifts in demand is minor. Pizam (2000) finds that a majority (71%) of victims of a terrorist incident involves tourists, in three-quarters of the cases the acts caused tourism demand to decline, and the median length of the decline demand was 1-3 months. Thus the recovery in approximately 50% of the cases was within three months or less. The tourism industry seems to be relatively resilient as tourist destinations have an ability to recover from the devastating effects of terrorism. "People will continue to want to travel, and they appear to be willing to consider a place again following a terrorist attack if proper marketing/image and crisis management occurs or, depending on the nature of the act, simply if sufficient time passes without further incident" (Pizam, 2000, p 136).

The impact of the 9/11 event was detrimental to the tourism industry as the volume of air travel in the US went down 31.6% in September 2001 compared to September 2000. Blunk, Clark, and McGibany (2006) generate forecasts of air travel in the post 9/11 period and compare these to actual air travel level to determine if the impact of the attacks was temporary or permanent. Over the 16 moth period the percentage error

(actual- forecast) changed from -54.1% in September 2002 to -11.6% in December 2002 showing that the damage was still being expressed over a year later but the air line sector was in the recovery process. Sloboda (2003) also finds that after one year from a terrorist attack the effects of terrorism persist, but they are not as strong as after the initial impact.

Although the events of 9/11 have made its mark on the results for the 2001 year, overall tourism figures held up rather well. The world experienced a -0.6% change in international tourist arrivals in 2001 (Kester, 2002). This was the first time the number of international tourist arrivals worldwide declined in two decades. Not only were the results from 2001 impacted by September 11th but also by a worldwide economic slowdown. Surprisingly, South Asia (rather than the Americas at -20.5% change in arrivals) experienced the largest decline of -22.8% change in tourist arrivals between September-December 2001. "This drop in international tourist arrivals in South Asia is due to the military conflict in Afghanistan, combined with the comparatively strong dependence on interregional source markets" (Kester, 2002). Africa was the only region in which tourism growth in 2001 exceeded the 2000 figure.

There was a general shift towards destinations closer to home as "travel within the same region increased by 0.6% while arrivals from other regions decreased by 6.4%" (Kester, 2002). Destinations strongly dependent on outbound tourism of the USA, destinations perceived as part of the Arab of Muslim world, and those perceived as close to the conflict zone, were proportionately hit hard (Kester, 2002). Thus the impact of September 11th did cause damage to the tourism industry, but studies have shown that recovery does take place and tourism industry has been increasing in international tourist arrivals since a year after the attacks. Surprisingly, the Middle East defined as Bahrain,

Egypt, Jordan, Lebanon, Saudi Arabia, Syrian Arab Republic, and United Arab Emirates has experienced the most average annual growth of arrivals of 10.1% between the years 2000-2005, whereas Europe grows at 2.2% and the Americas at 0.8% (WTO, 2007). Although terrorist attacks also took their toll to a varied degree on tourism demand for some Middle Eastern destinations, the impact was generally short-lived.

CHAPTER THREE

Model Summary

This chapter studies the supply and demand aspects of tourism and examines the variables that determine tourism demand. While the model in this study is not based on a specific model from the past, it does take into consideration the variables studied by Crouch and Shaw (1993) in their meta-analysis. The variables used in the model are GDP per capita, distance, population, population density, and exchange rates. The role each of these variables plays in international tourist arrivals will be explained later in this chapter. The goal of this chapter is to outline an economic model, with which I will estimate the determinants of tourism trends in five different regions represented by China, Egypt, Morocco, Italy, and the United States.

3.1 Demand and Supply for Tourism

Tourism creates the inflow of foreign currency, generates additional income, employment, and government revenue in the form of additional taxes for the host country. The input resources of the tourism sector, unlike that of other sectors, are immediately consumed in the destination. Although people have traveled throughout the history of mankind, it is only during the past four decades that tourism has become an important international economic activity. The rapid expansion of tourism, since the Second World War, was due to several factors such as the increase in per capita incomes and prosperity, people's desire to visit their ancestor's native homeland, the increase in

leisure time and paid vacations, and the development of cheaper and more efficient air transportation. International tourism plays a vital role in the economies of many countries today. In countries like the Bahamas and Barbados international tourism is of great importance to the economy, accounting for 65-70 percent of their export receipts.

Tourism has a positive effect on the balance of payments as a stable source of foreign exchange and this is emphasized in particular from the viewpoint of developing countries. Some authors have proposed that tourism can provide the much needed foreign exchange to finance the purchases of intermediate and manufactured goods in order to move the traditional economy to a modern one. Additionally, tourism also generates employment, although much of the directly generated employment tends to be seasonal. Thirdly, tourism can be a source of revenue for the governments although this aspect has not been fully utilized by many governments. Further, tourism can contribute to understanding of cultures and nations. Finally, tourism can stimulate growth and production in the commercial, agricultural and industrial sectors of the economy.

The strength of income contribution depends on the size of the multiplier coefficient. Many studies find a larger than average multiplier coefficient for the tourism sector. Similarly to demand for other goods, tourism demand can be explained with price and income factors. However there are factors that render tourism demand particular. First, tourism demand is for a bundle of goods and services, there is no single production sector with an output called tourism. Second, the distance to be traveled and the transportation costs have special importance since it is the consumers who are being transported to the goods and services rather than vice versa. Third, tourism demand is highly sensitive to non-economic factors such as wars, political instability, natural

disasters, contagious diseases, etc. Finally, seasonality is another characteristic of tourism demand creating unused capacity for much of the off season.

Several studies have shown that demand for tourism has been very income elastic, particularly the major tourist generating countries. Tourism demand has also been found to be price elastic. These high income and price elasticities, in addition to the increases in real per capita incomes, and the continuous declines in travel costs help explain the boom in tourism demand in the post World War II period. The development of mass media and travel advertising activities along with the rising level of education created an awareness of the nature, cultures and peoples around the world.

In regard to the supply side of tourism, tourism supply is classified into four basic components: natural resources and environment; the built environment; transportation; and hospitality and cultural resources (Goeldner, Ritchie, and McIntosh, 2000). The basic elements of natural resources and environment include air and climate, lands forms, terrain, flora and fauna, beaches, natural beauty and water supply. The built environment includes both the basic infrastructure - water supply systems, roads, communication networks - and the superstructure - which includes facilities built specifically for tourism such as airports, parks, marinas, hotels and motels. Transportation includes items such as ships, airplanes, buses, taxis, etc. Hospitality and cultural resources include the nature of the people and the culture of the area that make tourism successful - such as the history, literature, friendliness, courtesy and welcoming spirit.

Tourism destinations experience stages of development and stagnation and these stages are differentiated by factors such as the number of visitors, tourist's motivations, and the perception of the tourist by the residents or the degree of environmental damage.

Three characteristics valued by tourists are the quality of accommodation of services, public goods provided by the government, and environmental quality of tourism destinations. Tourism revenues may rise due to increases in accommodation capacity or because of improvements in the attractiveness of the tourism destination thanks to higher quality of private tourism services, higher public expenditure or better environmental quality (Lozano, Gomez, Rey-Maquieira, 2005). Tourism firms maximize profits by choosing the amount of capital and the number of accommodation units. There is a minimum threshold for accommodation quality below which tourist are not willing to visit the tourist destination. Thus, tourism is driven both by demand and supply and it is difficult to determine which way the causality runs.

3.2 Data Sources and Variables

The data for this research paper are gathered from three sources: the World Tourism Organization (WTO), a specialized agency of the United Nations, the United Nation's Common Database (UNCDB), a service of the UN Statistics Division, and the World Development Indicators Database (WDI), a World Bank publication containing annual compilation of data about development. Data is collected for 175 countries over a span of 11 years (1995-2005). The dependent variable used in the set is number of arrivals defined as international tourists and the explanatory variables used are GDP per capita, distance, population, population density, and exchange rates. The United States contains additional variables to capture terrorism and homeland security cost. More detail about each variable will be explained below.

The World Tourism Organization produces a CD-Rom containing both the compendium of tourism statistics and the yearbook of tourism statistics. Included on this CD are data on arrivals/nights of tourists and visitors and basic indicators related to tourism activities. The WTO is the only source with transportation costs for tourism passenger transport but it only gives numbers in terms of averages rather than transportation costs from individual origin countries. Thus, it is not used in my data set. Data on international tourist arrivals is broken down by country-to-country pairs and there is a clear breakdown of the number of arrivals from country i to country j.

The United Nation's Common Database (UNCDB) provides selected series from numerous specialized international data sources for all available countries and areas. Historical data on international nominal exchange rates and GDP per capita are provided from this database. For exchange rates, the series "US$ per national currency, period average" for years 1995-2005 was collected. This exchange rate is in nominal terms, so the consumer price index of both the origin country and destination country is used to compute real exchange rates. For income, I use GDP per capita in constant 2000 international dollars at purchasing price parity.

The World Development Indicators Database (WDI) is the World Bank's primary database for cross-country comparable development data, covering more than 700 indicators and 208 economies. Data for a country's total population from 1995 to 2005 is collected. Data for a country's area is collected to find the population density of each country. This database contains information for six different variables of international tourism (from the WTO) including expenditures (% of total imports and current US$), number of arrivals, number of departures, and receipts (% of total exports and current

US$). I use the number of arrivals for my data set as it represents the amount of outside visitors entering a country for visitation purposes.

3.3 The Model

While the model used in this study is not based upon a particular study, there have been many studies conducted in the past in terms of tourism demand which are used as guidelines. Gray (1966), Artus (1970, and 1992), Kwack (1972), Barry and O'Hagan (1972), Jud and Joseph (1974), Sunday (1978), Bond (1979), Little (1980), and Soest and Kooreman (1987) all used a typical multivariate regression analysis with income in the tourist generating countries, price, exchange rates, and airfare as explanatory variables. All of these studies have provided useful information, but they are concerned with tourism demand to/from one particular country or a group of two or three competing or substituting countries. Meta-analyses have been conducted to capture the findings of multiple studies but these are difficult to interpret since the data is different in each case.

Unfortunately there is not a large enough time frame to collect data for every country. Thus I choose to use one country from each region (The Americas, Europe, Asia and the Pacific, Africa and the Middle East) as the destination country and test the model with 174 origin countries from around the world. The countries chosen were based on the percent of market share each one holds in their respective region for international tourist arrivals and the average annual tourism growth from 1990-2004. All five countries either lead their region on market share, have the most average annual growth, or both. The five representative destination countries are the United States for the Americas region, Italy for Europe, China for Asia and the Pacific, Egypt for Africa,

and Morocco for the Middle East region[1]. France happens to be the leading country for Europe in terms of market share and annual growth but there is an insufficient amount of data available for the number of arrivals to France, so the second rank (Italy) is used instead.

I will run five regressions that include data for 175 countries for 11 years, one for each of the chosen destination countries. I am testing to see if world-wide tourism trends can be determined based on the variables used, and if so what do these trends represent? Are there certain factors that heavily influence tourism flows and others that play little significance as to where one chooses to travel?

Based on research and available data the following model has been derived:

$$ARR_{ijt} = \beta_0 + \beta_1 GDPPC_{it} + \beta_2 DIST_{ij} + \beta_3 POP_{it} + \beta_4 POPDEN_{it} + \beta_5 EXCH_{ijt} + \varepsilon_i$$

This model will also be applied in log-log functional form to test elasticities i.e.

$$\log(ARR_{ijt}) = \beta_0 + \beta_1 \log(GDPPC_{it}) + \beta_2 \log(DIST_{ij}) + \beta_3 \log(POP_{it}) + \beta_4 \log(POPDEN_{it}) + \beta_5 \log(EXCH_{ijt}) + \varepsilon_i$$

where:

ARR: The number of arrivals of international tourists from country i to country j in year t

GDPPC: Gross domestic product per capita in country i in year t, measured in constant 2000 international dollars at purchasing price parity

DIST: The distance between country i and country j, measured in kilometers based on the middle-most point of each country.

POP: The population of country i in year t, measured as the country's total population

POPDEN: The population density of country i in year t, measured as the country's total population divided by the country's total area.

EXCH: The real exchange rate between country i and country j in year t, measured in [(US$ per national currency, period average)*($P_{\text{price level in destination}}$)] / [($P_{\text{price level in origin}}$)]

[1] The WTO categorizes Morocco as part of the Middle East Region even though it is located in Africa.

The regressions were run with fixed effects, which allows for one equation for all origin countries rather than individual regressions for every origin country. The fixed effect takes into account some of the differences between the countries, such as the number of attractions. For panel data, the fixed effect could capture the unique characteristics of each origin country.

This thesis is set out to try to find what factors affect tourism trends. There are several methods used to track these trends and I choose to use the number of arrivals of international tourists a country receives each year as the dependent variable for the data set. This variable represents the number of outside visitors entering a foreign destination. The purposes of the visit can be broad; although countries for which the numbers of arrivals are almost exclusively due to religious pilgrimages, such as Saudi Arabia, are excluded from this study. While the precise purpose of these visits is not the concern of this paper, rather the determining factors as to why people choose to travel are what are significant to this paper. Thus, the number of arrivals will be regressed on the explanatory variables in the data set to try to determine which factors significantly affect the number of tourists entering a foreign country.

It is expected that the higher income one earns, the more money one can spend on luxury goods (such as traveling). Hence, it is expected that there is a positive relationship between GDP per capita and tourism demand. This may be the most important variable to consider because if a country is poor, it is highly unlikely that many citizens can afford to travel outside their borders for vacation. There may be the case where residents of some countries may never have a high enough income to travel, so an increase in income may have little impact on tourism demand.

Transportation costs are provided from the World Tourism Organization. It is supposed that this is a price-related factor and there is a negative relationship between transportation costs and tourism demand. This negative relationship shows how the higher the transportation costs the more expensive it costs vacationers to travel, and hence would entice some travelers to diminish purchasing airfares. Unfortunately the data set provides the average transportation costs to a host country so country-to-country specific information cannot be gathered. While information on transportation costs exists, it is not used in this study since country pair information cannot be obtained. Instead, distance is used as a proxy for transportation costs. I hypothesize that the highest price sensitive demand comes from those who have to travel over greater distances, meaning costs are higher, and price becomes a more important factor. In terms of choosing a destination, the more developed countries usually can afford to choose from a larger range of countries since they have the means to purchase expensive airfares to far-away destinations whereas developing countries tend to have lower incomes thus restricting them on which destinations they can afford to travel to (i.e. they may have to travel within their border or to nearby countries where transportation costs are low).

The population variable is used to test if highly populated countries tend to travel more since it may be thought that there is a greater chance someone will make an international venture. The population is in terms of total population of the origin country and I hypothesize that there is a positive relationship between population and tourism demand. The more populous a country, the more likely there are people willing to travel.

The population density variable tests to see if countries that have a high population density tend to travel within its own boarders rather than venture to foreign

countries. If a country has a high population density, it may lead one to believe that more commercial and man-made attractions exist within the country since there are many people which the country must accommodate. A negative sign is anticipated since a densely populated country is expected to have many attractions where its own citizens would be inclined to travel within borders rather than abroad. One might want to travel to a deserted area for natural landscape but for the most part people tend to travel to see man-made attractions such as the Eiffel tower, the Pyramids of Egypt or the Great Wall of China. While population and population density do not directly relate to the number of attractions, these variables may capture information regarding the number of attractions. However, the number of attractions that a country has is relatively constant, so this should be captured through the fixed effect.

The exchange rate variable is introduced to determine if tourists are price sensitive. The nominal exchange rate variable is defined as (US$ per national origin currency)*(destination currency per one US$) for the period average. These prices represent the costs of staying in the host country, for example hotels, food, tours, etc. Tourists are more likely to be aware of, and perhaps more sensitive to, exchange rates when selecting a destination than they are of local currency prices in the destination. Exchange rates affect the (perceived) cost of a destination so a negative sign is expected (where the exchange rate is expressed as the ratio of units of the origin country's currency per unit of the destination currency).

Tourism flows should react to the real exchange rates, not the nominal exchange rate. The real exchange rate variable is defined as [(US$ per national currency, period average)*($P_{\text{price level in destination}}$)] / [($P_{\text{price level in origin}}$)] and this variable is used in the

economic model. Whereas the nominal foreign exchange rate is the rate at which one currency can be traded for another, the real exchange rate takes price levels for both countries into account. For example, if a developing country experiences high inflation, a nominal exchange rate study may not capture the underlying relationships. If this foreign currency depreciates with say the dollar we should expect to see an increase in U.S. travel departures to this developing country as Americans would capitalize on a cheaper vacation or go on a shopping spree by purchasing more foreign goods and services for the dollar. However, suppose at this same time the foreign country's inflation greatly rises whereas the U.S. experiences only a marginal inflation increase. Even though the U.S. dollar bought more foreign currency than before, at the same time the price of the foreign goods increased by a higher level. Thus, we need to calculate the real exchange rate of the foreign currency with respect to the dollar. This would then mean that U.S. residents would decrease their travel flows to this foreign country. Thus, exchange rate converts to real (inflation adjusted) terms when origin and destination price levels are incorporated into the nominal exchange rate.

Caution should be taken when looking at the exchange rate variable for Italy as the transition year from the Italian Lira to the Euro (1999-2000) is included in the data set. Also caution should be taken with China exchange rate as China does not have a floating exchange rate which may cause error if the variable is not changing.

An events variable was assembled as a dummy variable with a 1 given to country which hosts large events such as an Olympic event or a World Expo and a 0 given to a country which does not hold either of these events in a year. I propose that there is a positive correlation between the events variable and tourism demand due to the idea that

these events will promote outside visitors to come to the host site. Unfortunately this variable cannot be used due to the multitudinous amount of 0's and infrequent amount of 1's which causes a near singular matrix error to occur.

Lagged variables can be created to determine if tourism trends are subject to current situations or situations of the past. Tourism growth rates could represent underlying tastes or fashion in international tourism. If a person has a wonderful experience visiting one foreign country he/she may strongly suggest visitation to that country to another person and hence creating a trend to travel to a particular country. In economic terms, if a country is experiencing a low number of international departures it may be due to a slowdown in the economy from the previous years, meaning its citizens cannot currently afford to travel.

Two additional variables are introduced to the United States data set. A dummy variable is defined as 0 for the years 1995-2000 and 1 for the years 2001-2005 to test the effects of the terrorist attacks of September 11th, 2001. I expect to find a negative sign for this variable as global tourism arrivals declined after the attacks, especially in the United States. The second variable introduced is a time trend with a 1 specified to 1995, 2 to 1996, etc. I suspect that the trend coefficient is negative as homeland security costs have risen post 9/11, suggesting it is harder for outsiders to enter the United States and possibly causes fewer visitors to enter.

Much research has been conducted on relationship between terrorism and tourism. While terrorism often can affect tourism, this paper omits this variable, except for the dummy variable introduced in the United States data set. Studies have shown that while terrorist attacks often affect tourism, the tourism sector recovers shortly after. This

particular sector is resilient to such attacks and most often recovers within a few months of the attack.

I will test the model in log-log specification to see how international arrivals react to the elasticity of the dependent variables. The coefficients in this form represent the elasticity of each variable. For example, controlling for all other factors, if GDP per capita increases by 1 percent, then the number of international arrivals will increase by β_1 percent. I expect the coefficients to be the same as the linear functional form. This model may prove to be a better fit for the model.

3.4 Limitations to the Model

While the modeling of international tourism has provided useful results, any attempt to generalize the results across studies is difficult due to the variability in empirical findings. Demand for international tourism varies regionally in terms of both origin and destination. That is, the magnitude of demand depends upon a pair of countries (origin and destination) of interest. Comparison of demand coefficients across country pairs is not possible for the allotted time period of this thesis. This thesis provides information on country pairs for origin and destination countries for five specific destination countries.

There are variables that I would like to include in the model but the pertinent data were not available. For example, information from government offices for government spending or marketing was not readily available. None of the 80 studies Crouch and Shaw (1993) review attempts to model industry-wide marketing expenditure, further illustrating that this variable is unattainable. It is assumed that different nationalities respond differently to marketing and that different destinations also vary in their ability to

use marketing to attract tourists. Some countries market to a specific area or audience. For example, the Mediterranean would not try to market a sun-lust vacation to citizens of Hawaii.

Another variable that is not used in the model is the number of attractions of the destination country. Not only could information not be obtained regarding the number of attractions, but this thesis is focused on trends and this variable would be constant. It is very rare for a country to increase its number of attractions, whether it is man-made or natural, on a yearly basis. For example, there is (and will only be) one Taj Mahal, it took years to collect famous art for the Louvre, and the Colosseum cannot be located anywhere but Rome. A country cannot build the Alps overnight nor miraculously go from landlocked to having access to sea. The fixed effect, mentioned above, will account for factors specific to a country, in this case, the number of attractions.

It must also be noted that this study only focuses on explanatory variables for the demand side of tourism and variables regarding the supply side of tourism are not considered. Tourists may choose to visit a particular country based on what the destination country can supply to its visitors. It may be that the most visited countries have the best accommodations. A question one might be interested in researching is, does enhancing accommodations have a significant effect on increasing international tourism? Only 2% of the studies Crouch and Shaw (1993) analyses use supply side factors, but supply factors may prove to be significant in describing tourism trends.

It may also be the case that diaspora effects exist. For example, a rise of U.S. resident traveling to India may be because the U.S. residents traveling to India are Indian or first generation immigrants. If a family has background heritage to country other than

the one they are living in, the family may be inclined to visit their homeland. Additionally, someone who lives in a community that is a majority Indian or has a presence of Indian friends may be more inclined to visit India than another destination.

Finally, we must consider that every individual has their own perception of where they want to travel, regardless of their location. People have a lifetime experience of news, family, friends input so everyone's decision on where to travel will be different. You would expect that country averages would incorporate the majority of its citizens but there are others within the same country that has differing views. Everyone has a different perception. Two individuals from the same origin country could go to the same destination country and have two extremely different experiences. Choosing a destination also depends on the person you are; someone who loves something new may like to go somewhere adventurous whereas others love traditional experiences and continue to travel to the same destination. There are changing attitudes to international tourism that could affect the variables being studied.

It must be noted that there is an overwhelming amount of variables possible to include in the study.

CHAPTER FOUR

Empirical Results and Policy Implications

The purpose of this chapter is to present the empirical results from this study. Using Ordinary Least Squares regressions in Eviews the dependent variable was regressed on the following variables in various combinations, to determine their influence on the number of international arrivals: the distance between the origin country and the destination country, GDP per capita of the origin country, population of the origin country, population density of the origin country, and the real exchange rate between the origin country and the destination country. A dummy variable for the terrorist attacks on September 11th, 2001, and a time trend for an annual increase in homeland security restrictions is introduced in the United States regressions. The purpose of these regressions is to determine which factors contribute to international tourist arrivals.

As mentioned in the previous chapter, five regressions were run, one for each of the destination countries (Table 1- Table 6). These regressions use the same variables and time period but are applied to five different host countries, so that the information for GDP per capita, population, and population density remain unchanged, but the distance and exchange rates vary depending on which destination country is considered. The United States regressions include two additional variables that represent specific aspects of the United State's tourism industry which are not included in the other regressions. The two variables that specifically pertain to the United States are the 9/11 terrorist attack dummy variable and a time trend variable accounting for increasing costs for homeland

security. Caution must be taken when examining Italy's results since the exchange rate variable does include the time period when the Italian Lira was used, the transition year from the Lira to the Euro, and then a time period of the Euro. The following tables contain the results of the regressions that were computed with Eviews. Eight regressions for each destination country are included in the table, except for the United States which has fifteen regressions. The coefficients of each of the variables and the constant are included for each regression. Also included in the tables is N, the number of observations per regression and the adjusted R^2. Asterisks indicate the significance of the estimated coefficients, and the standard error is in parentheses. Significance test and adjusted R^2 will be explained in later sections. For variable descriptions and summary statistics of the data see Appendix A. The sample period for all regressions is 1995-2005.

4.1 Significance:

The previous tables list the regression results for the China, Egypt, Italy, Morocco, and the United Sates-specific regressions. Based on prior reasoning, the independent variables were tested in different combinations with time lags and linear and log specifications. The coefficients are listed and asterisks are placed in front of coefficients that were found to be significant at different levels. If an explanatory variable is found to be significant, then the null hypothesis, that the coefficient is not significantly different from zero, is rejected (Halcoussis, 2005). Significance was determined by the p-value produced by Eviews. A p-value greater than zero and less than 0.01 signifies that the coefficient is significant at the 1 percent level. A p-value between

0.01 and 0.05 shows that the coefficient is significant at the 5 percent level. A p-value between 0.05 and 0.1 is used for coefficients that are significant at the 10 percent level. For the purpose of this study, coefficients are only considered significant at the 1 percent, 5 percent and 10 percent levels. In the previous tables coefficients marked with three asterisks are significant at 1 percent, two asterisks are used for coefficients significant at 5 percent, and one asterisk is used for coefficients that are significant at the 10 percent level.

Finding a variable's significance is a way of testing the reliability of the regression results. The lower the significance level, the more precise the results are. The null hypothesis used when testing the coefficients' significance is H_0: $\beta_i = 0$, with the alternative hypothesis, H_A: $\beta_i \neq 0$. If the p-value falls within the range previously defined, then the hull hypothesis is rejected and the coefficient is significantly different from zero. Results are generally taken to be less reliable once the significance level is greater than 10 percent because there is a higher likelihood of misinterpreting the significance of the coefficients (Halcoussis, 2005).

4.2 Durbin-Watson and Adjusted R^2:

It should be noted that the Durbin-Watson statistic is used to determine if there is serial correlation in the error term of the equation. The range for the Durbin-Watson d-statistic falls in the range of $0 \leq d \leq 4$. A d-statistic closer to 0.0 shows positive serial correlation, closer to 2.0 shows no serial correlation, and closer to 4.0 shows negative serial correlation. The specific range of acceptable d-statistics depends on both the number of variables and the number of observations in each regression (Halcoussis,

2005). Based on the results of the regressions, positive serial correlation occurs in all cases. One way to fix this is to include an auto regressive variable to the regression. Adding this correction makes all of the regressions have no serial correlation. Another way to tackle this issue is to set the time period to one year and run regressions; that is run a purely cross-section study.

In addition to the coefficients and their respective p-values, the regression result tables also include the adjusted R^2 statistic for each regression. R^2 is the coefficient of determination, which is a "goodness of fit" measure of all the coefficients in the equation. R^2 must lie in the range of $0 \leq R^2 \leq 1$, where a value closer to 1 shows that the coefficients fit well (Halcoussis, 2005). A R^2 value closer to zero shows that the equation is insufficient, possibly due to omitted variables, which were explained in the previous chapter. This thesis uses the adjusted R^2 instead of R^2 because adding an independent variable to an equation does not decrease the R^2 at all, so in a comparison of two equations, the one with more variables will have a higher R^2 value. Adjusted R^2, however, will increase, decrease or stay the same if an additional independent variable is included in the equation. The adjusted R^2 is very low when the model is in linear form but the adjusted R^2 becomes very close to 1.0 when log-log functional form is used. The adjusted R^2 values for the China-specific regressions fell in a range of $0.380 \leq R^2 \leq 0.708$. The adjusted R^2 values for the Egypt-specific regressions fell in a range of $0.064 \leq R^2 \leq 0.802$. The adjusted R^2 values for the Italy- specific regressions fell in a range of $0.063 \leq R^2 \leq 0.747$. The adjusted R^2 values for the Morocco-specific regressions fell in a range of $0.052 \leq R^2 \leq 0.788$. The adjusted R^2 values for the United States-specific regressions fell in a range of $0.058 \leq R^2 \leq 0.848$. These results are not surprising considering that it is

nearly impossible to create a model that contains every significant contributing factor to international arrivals. However, it is interesting to note how much the adjusted R^2 values change depending on which functional form is used in the model.

4.3 Data Interpretation:

GDP per Capita (GDPPC):

The GDP per capita variable was significant for all five country regressions. It is evident that GDP per capita affects the number of international arrivals. In *all* regressions, the coefficient is positive and significant. It is a robust variable in that all five destination countries are highly significant and positive, as predicated, irrespective of the other variables and country specifications. The positive correlation between GDP per capita and international arrivals is also in line with all of the studies surveyed by Crouch (1993).

When considering income elasticities (with log-log specifications), the estimates are income elastic indicating that most international tourism is regarded as a "luxury". The Italy-specific regressions had the highest average income elasticities of demand (+1.93). Other income elasticities vary around +1.10, being higher for the United States and Morocco and lower for China and Egypt. There may be other countries (not included in this study) that have small numbers for income elasticities, implying an inelastic demand in response to changes in income. The higher elasticities may be regarded to long-haul trips that may be seen as a luxury. Travel to the high elasticity destinations may come from other regions, whereas more travel to the low elasticity destinations may originate from countries in the same region. International tourism to the world's

principal regions, Europe and the Americas, display the highest income elasticities. This implies that a 1 percent increase in the origin countries income causes the number of international arrivals to the destination country to increase by β_1 percent.

Distance (DIST):

The distance variable acts as a proxy for transportation costs and hence represents a price-related factor. This independent variable is significant in all but one of the regressions (see Table 4.3) and the distance elasticity is significant in all of the regressions in which this variable is included. There is a negative correlation in all of the regressions, which coincides with my hypothesis. The range of the coefficients varies depending on the country considered. All else equal, the distance coefficient for the Morocco-specific regressions average a decrease of -4.74 arrivals for every additional kilometer between origin country and Morocco, whereas the coefficient for distance for the United States-specific regressions average a decrease of -146.5 arrivals for every additional kilometer between origin country and the United States. Hence, all else equal, for a one kilometer increase in distance between an origin country and these two destination countries, the number of arrivals will decline more in the United States compared to Morocco.

Average distance elasticities by destination country vary with a low of -0.879 for the Italy-specific regressions and a high of -2.61 for the United States-specific regressions; and the differences are statistically significant. This elasticity means that a 1 percent increase in the distance between the origin country and destination country causes the number of international arrivals to the destination country to decrease by β_2 percent. Average elasticities are highest for the United States and China and lowest for Italy with

Egypt and Morocco in the middle. These numbers show that for regions with many countries nearby (i.e. Europe), distances and transportation costs do not have as large of an effect on the number of international arrivals compared to countries which are farther to travel to. Since all of the regressions provide negative and significant coefficients, it can be concluded that all else equal, an increase in distance does lead to fewer international arrivals. This explanatory variable is also robust in that it is significant and negative for all five country-specific regressions. This suggests that no matter what destination country is evaluated, a greater distance between two country pairs will reduce international tourist arrivals to the host country.

Population (POP):

The population coefficient is significant in 76 percent of the regressions and positive, as predicted, in 81 percent of the regressions. In China, Italy and Morocco country-specific regressions, at least one regression is not significant while the population coefficient for Egypt and the United States are significant in every regression. The population coefficient is negative for the regressions run for China and once for the Untied States and positive in all regressions for Egypt, Morocco and Italy. The negative sign for the population coefficient in the China-specific regressions is perplexing as it is apparent in all of the China-specific regressions but this negative relationship is very rare for the other four country-specific regressions.

The population elasticity variable (with log-log specification), is significant and positive in all five country regressions. Thus the population elasticity may be a better representation for international tourism arrivals as it is robust for all five country regressions. This suggests that a 1 percent increase in the origin country's population

causes the number of international arrivals to the destination country to increase by β_3 percent. Population elasticity varies the most for Italy, ranging from +0.396 to +0.899. These figures are the minimum and maximum for all five country-specific regressions with all the other countries have numbers ranging from +0.6 to +0.8.

Population Density (POPDEN):

The population density variable takes not only the origin country's population into account but also the origin country's area to see how densely populated a country is. The expected negative for the coefficient is evident 70 percent of the regressions. The China-specific regression has the opposite again, where all China-specific regressions have a positive sign for the coefficient for population density. All four other country-specific regressions have a negative sign for the population density explanatory variable for the majority of cases. However, this variable is significant in only 39 percent of the regressions. It is significant for all of the Egypt-specific regressions and the China-specific regressions, not significant for any of the Italy-specific regressions, and only significant in few of the United States-Specific regressions and the Morocco-specific regressions.

The population density elasticity (with log-log specification) is statistically significant in all five country-specific regressions. However, the expected negative sign is not evident in all of the regressions. The United States-specific regressions have a positive sign for all the coefficients for the population density elasticity. The other four country-specific regressions have negative coefficients, for the majority cases, as hypothesized. The Morocco-specific regressions and Italy-specific regressions have negative coefficients in all of their regressions. The Egypt-specific regressions and

China-specific regressions have negative coefficients for population density elasticity for 50 percent and 66 percent of their regressions respectively.

It is interesting to note that when considering population density, the China-specific regressions have a positive coefficient but when considering population density elasticity the coefficient becomes negative. Conversely, when considering population density the coefficients for the United States-specific regressions are negative but when looking at population density elasticity the United States-specific regressions switch to a positive sign for the coefficient. The coefficients for these two country specific regressions switch signs depending on the functional form used in the regressions, while the sign of the coefficient for the other three country-specific regressions (Egypt, Morocco and Italy) are consistent for both functional forms. One could argue that all else equal an increase in population density might lead to more outgoing tourism. However, the case for this expectation is not clear cut and I am going to let the data shed light on this question. There may be other factors that the population density variable is proxying so this expectation is not 100% clear.

Exchange Rate (REXCH):

While in previous studies the cost of living for the tourist in the destination is often disregarded as an explanatory variable, consumers are more aware of the exchange rates and hence this variable is more often used in studies. But nominal exchange rates alone are misleading as inflation rates are not included, so the consumer price index is taken as a proxy for the cost of tourism in that country. The consumer price indices of both the origin and destination countries are included into the real exchange rate variable, which allows for (inflation adjusted) exchange rates to be used as an explanatory

variable. Empirical results show that the nominal exchange rate is not an acceptable explanatory variable but when consumer price indices are included, the real exchange rate is an acceptable explanatory variable.

It is expected that the coefficient for the exchange rate variable should have a negative sign. The exchange rate variable is negative in 44 percent of the regressions. While this variable is only significant for 33 percent of the regressions, 44 percent of those with the correct negative sign are significant. The China-specific regressions and United States-specific regressions have negative coefficients as predicted whereas the Egypt-specific regressions, Morocco-specific regressions, and the Italy-specific regressions have positive coefficients. The China-specific regressions are all significant and the other four country-specific regressions are significant in a few of the regressions considered. China is the only destination country that is both significant and has the expected negative sign for the coefficient for all China-specific regressions.

The exchange rate elasticity is significant in 94 percent of the regressions but the expected negative coefficient is only evident in 13 percent of the regressions. Again, the China-specific regressions and United States-specific regressions have negative coefficients, as anticipated, whereas the Egypt-specific regressions, Morocco-specific regressions, and the Italy-specific regressions all have positive coefficients. These results show that the exchange rate elasticity is acceptable for destination countries but the sign on the coefficient is not universal and differs depending on the destination country considered.

Lagged Variables:

A lag was placed on the GDP per capita and exchange rate variables to test if data on these variables from the year t-1 affect international arrivals for year t. It turns out that the lag for GDP per capita and GDP per capita with log-log specification are significant and positive for all five country-specific regressions. Even with a lag introduced, the GDP per capita explanatory variable continues to be robust. The lag for the exchange rate is not significant and again the negative coefficient is evident only in the China-specific regressions and the United States-specific regressions. This is consistent with the results found for the exchange rate explanatory variable without a lag. When the lag is introduced to the exchange rate elasticity variable, it is significant for the Egypt-specific regressions, the Morocco-specific regressions and the United States-specific regressions. With the lag included, the United States is the only destination country which contains the expected negative sign for the exchange rate elasticity coefficient. The positive sign on the coefficient is consistent for the Egypt-specific regressions, the Italy-specific regressions, and the Morocco-specific regressions but the sign has changed for the China-specific regressions. Thus using a lag for these two explanatory variables does not alter the results to a large extent except for the China-specific regressions whose sign changes for exchange rates when the lag is complemented.

Trend:

A trend is introduced to the United States-specific regressions to test for homeland security costs. After September 11th, 2001, it became much more difficult to travel in and out of the U.S. borders. There is more security at airports, especially

international airports, and there have been more restrictions as to which outsiders may enter the American border. Thus, a trend is introduced to test if international arrivals have declined each year due to these increasing costs in homeland security controlling for other relevant variables. For both linear functional form and log-log form, the sign of the coefficient for the trend is negative and significant in log-log functional form. Thus, increasing costs in homeland security do significantly have a negative effect on international arrivals.

Dummy Variable:

A dummy variable is introduced to the United States-specific regression to see if the terrorist attacks on September 11th played a significant role in the tourism sector. The dummy is given a value of 0 for the years 1995-2000 and a 1 for the year 2001-2005. The dummy variable is negative in all the regressions in which it is included and it is significant for a majority of the regressions. This variable continues to be negative and significant when the model is in log-log form and when the lagged variables are included. Thus, there is a negative relationship between the terrorist attacks and international arrivals. All else equal, international arrivals were reduced in the years when the dummy was equal to 1 (2001-2005) compared to the years when the dummy was equal to zero (1995-2000).

4.4 Policy Implications

The model developed in this study provides insight into the determining factors of tourism, which was the primary goal of this study. In all five country-specific regressions, GDP per capita was positive and significant and distance was negative and

significant. These two robust variables prove to play a very significant role in determining which country to travel to whereas the other variables are not uniformly significant. These two explanatory variables are the leading factors of my model which help predict tourism trends. Thus destination countries that are trying to promote outside visitors should focus on origin countries that are relatively nearby who have high incomes.

The results from this study show that the population variable is insignificant for the China-specific regressions but it is positive and significant for the other four country-specific regressions. This suggests that population is a significant explanatory variable for four regions but not for the Asia and the Pacific region. Thus destination countries in the Europe, Americas, Middle East and Africa regions should consider the population of the origin country when marketing for tourism. Similarly, the results from this study show that the population density variable is positive for the China-specific regressions but significant and negative, as predicted, for the other four country-specific regressions. Again, destination countries in the Europe, Americas, Middle East and Africa regions should consider population density of the origin country and try to market towards those countries which are not densely populated.

The results from this study show that the exchange rate explanatory variable is significant and negative, as hypothesized, for the China-specific regressions and the United States-specific regressions. International tourism to these two countries is affected by the exchange rate between the host country (either the United States or China) and the origin country. If the U.S. dollar continues to depreciate, we should expect to see more international arrivals as foreign currencies will become stronger compared to the

dollar. It will become cheaper for outsiders to travel to the United States and goods and services within the United States border will be less expensive for outsiders, provided inflation in the U.S. versus inflation in other countries is relatively the same.

Terrorism has become a major issue in the global economy as the war in Iraq continues to persist. Many sectors of the economy are affected by a terrorist incident, especially the tourism industry. The terrorist attack on September 11th, 2001, has changed the economy ranging from increases in oil prices to increases in homeland security costs. The time trend accounting for increases in homeland security costs proves to be significant and negative. This suggests that international arrivals to the United States has declined throughout the 11 year period of this study, implying that increases in homeland security costs have caused travelers to venture to other destinations.

Another way to see how terrorism has affected the economy and in turn the tourism industry is to introduce a dummy variable where a 0 is given to years before 9/11/2001 and a 1 for years post 9/11 (including 2001). The United States-specific regressions show that this variable is significant and negative, as forecasted. This dummy variable accounts for a disturbance that may have biased the estimated parameters if it had been ignored. Thus, including this dummy variable allows us to see how international arrivals to the United States have been impacted in a negative fashion due to the September 11th terrorist attacks.

The results of this study have shown that several of the determining factors of international tourism demand include GDP per capita, distance, population, population density, exchange rates, and in the instance of the United States, a dummy variable and time trend. These results yield the general conclusions that destination countries that

consider these explanatory variables in the formulation of their tourism policies will see a higher number of international arrivals, all else equal, whether it is through attracting visitors with high incomes, or outsiders from nearby origin countries, or countries that are highly populated, or countries that have a low population density, or countries that have a strong currency with respect to the destination country.

CHAPTER FIVE

Conclusion

The goal of this senior thesis was to explain, in part, the leading factors which cause international tourists to arrive to a specific country. This study used a particular set of five destination countries as a proxy for the five regions which the World Tourism Organization categorizes. In contrast to previous studies in the literature, this study examines tourism trends on a global level rather than tourism trends of a specific host country.

It is evident that all five regions are growing in terms of international arrivals. Gaining knowledge regarding how to forecast tourism trends will be helpful to tourists, tourist agencies and others involved in the tourism industry. If one country is experiencing a high percentage growth of international arrivals, other countries may wonder what factors are contributing to this growth. This thesis examines the possible factors causing these tourism trends and gives insight as to what the leading variables are. Destination countries can then use this knowledge to try and promote tourism to countries where the leading variables will play a significant role; or in other words, promote in countries where the rate of return on promotion expenses might be the highest.

This study finds that GDP per capita and distance are both robust explanatory variables, as both variables are highly significant for all five country-specific regressions. GDP per capita has a direct correlation to the number of international arrivals whereas distance has an inverse relationship. Thus, it can be concluded that people travel from high income areas that are relatively nearby to the destination country. Host countries

should promote tourism packages to nearby wealthy countries. The results for the other three explanatory variables (population, population density, and exchange rates) vary depending on which destination country is considered.

It was discovered that using log-log functional form for the regressions proves to provide better results. Thus, looking at the elasticity corresponding to explanatory variables may be a better way of interpreting tourism trends. The elasticity coefficients of the population variable in all five country-specific regressions are positive and significant. The coefficients of the population density variable in all five country-specific regressions are significant, with four of the countries experiencing a negative sign in front of this coefficient, as hypothesized. Finally, the coefficients of the exchange rate variable in all five country-specific regressions are significant, but the anticipated negative sign is not universal. Although these findings do not prove to be correct for all of the regressions, the results are significantly improved when considering the economic model in log-log functional form rather than linear form.

One must not forget that there are hundreds of other factors that may play a role in determining tourism trends, so how does a researcher know which ones are truly relevant and which ones are insignificant? It would be interesting to see how variables such as marketing, government spending, transportation costs, weather, ethnic ties, and ethnic attraction affect international arrivals on a global perspective. Unfortunately, the data for these variables were unavailable and could not be included in this study. Also due to the time limit of this thesis, this study only considers five destination-countries. If more time is allotted, this study can be expanded to include all destination countries to provide a

comprehensive set of results. If more countries are included into the study, a better understanding of these explanatory variables can be concluded.

It is vital to future forecasting to integrate a variable that has not yet been included in previous studies. Since cultural differences affect human perceptions, I would introduce a "cultural" variable that illustrates how each country views travel. Unfortunately there is no concrete data set for this variable and it would be very difficult to compile such a data set since it is of subjective nature. A way in which we can capture this variable would be to interview travelers and fill out a questionnaire when crossing borders. The next project may be interested in gathering data on this variable to include it into the study.

This thesis provides a general model to track tourism trends; however, I recognize that each area has certain site-specific variables which international arrivals depend on. For some of the variables, the signs of the coefficients vary depending on which destination country is considered. This suggests that answers provided by this model are dependent on which destination countries are used. A more comprehensive data set, consisting of all destination countries, may be compiled in order to see tourism forecasting on a truly global outlook.

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Table 1 China-specific Regressions

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant (β_0)	314821	782539**	404867	451878	7.85***	23.1***	10.1***	10.4***
	(3.80E05)	(3.55E05)	(4.03E05)	(4.32E05)	(0.897)	(1.24)	(1.07)	(1.11)
GDPPC	35.6***		35.0***					
	(12.7)		(12.8)					
log(GDPPC)					1.01***	0.900***	1.01***	
					(0.0404)	(0.0547)	(0.0426)	
GDPPC(-1)				35.0**				
				(13.9)				
log(GDPPC(-1))								1.01***
								(0.0442)
DIST	-55.9*	-69.5**	-60.8*	-64.8*				
	(30.5)	(29.8)	(31.3)	(33.6)				
log(DIST)					-1.96***	-2.46***	-2.11***	-2.13***
					(0.0679)	(0.0982)	(0.0773)	(0.0802)
POP		-0.000989	-0.000797	-0.00084***				
		(1.15E-03)	(1.17E-03)	(1.26E-03)				
log(POP)					0.614***		0.621***	0.623***
					(0.0218)		(0.0225)	(0..0234)
POPDEN	1.23***	1.24***	1.22***	1.26***				
	(0.0509)	(0.0499)	(0.0516)	(0.0546)				
log(POPDEN)						0.0115*	-0.0826***	-0.0868***
						(0.0346)	(0.0271)	(0.0282)
REXCH	-135396***	-107170***	-136229***					
	(2.82E04)	(2.61E04)	(2.85E04)					
log(REXCH)					0.0431**	-0.0180***	0.0333*	
					(0.0174)	(0.0244)	(0.0190)	
REXCH(-1)				-140922				
				(3.069E04)				
log(REXCH(-1))								0.0319
								(0.0197)
N	1055	1055	1055	1055	1055	1055	1055	1055
Adjusted R^2	0.384	0.380	0.384	0.386	0.686	0.511	0.706	0.708

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Columns 1-4 have linear specifications
Columns 5-8 have log-log specifications

Table 2 Egypt-specific Regressions

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant (β_0)	32026***	62790***	28484***	31115***	7.60***	-15.6***	-4.94***	-4.81***
	(7569)	(7331)	(7590)	(8217)	(1.02)	(0.666)	(0.683)	(0.723)
GDPPC	4.06***		4.14***					
	(0.340)		(0.340)					
log(GDPPC)					1.08***	1.15***	1.29***	
					(0.0598)	(0.0448)	(0.0365)	
GDPPC(-1)				4.39***				
				(0.371)				
log(GDPPC(-1))								1.29***
								(0.0386)
DIST	-5.47***	-5.43***	-5.79***	-6.14***				
	(0.950)	(0.991)	(0.950)	(1.03)				
log(DIST)					-1.19***		-1.35***	-1.37***
					(0.0879)		(0.0533)	(0.0563)
POP		0.00005**	0.00007***	0.00007***				
		(0.00002)	(0.00002)	(0.00002)				
log(POP)						0.832***	0.868***	0.873***
						(0.0260)	(0.0206	(0.0218)
POPDEN	-0.00382**	-0.00181	-0.00381**	-0.00383**				
	(0.00167)	(0.00174)	(0.00157)	(0.00718)				
log(POPDEN)					0.126***	0.0642**	-0.0425*	-0.0516**
					(0.0396)	(0.0301)	(0.0243)	(0.0258)
REXCH	1112	5295***	1211					
	(1013)	(1000)	(1008)					
log(REXCH)					0.0984***	0.208***	0.127***	
					(0.0282)	(0.0206)	(0.0171)	
REXCH(-1)				850				
				(1080)				
log(REXCH(-1))								0.124***
								(0.0181)
N	941	941	941	941	941	941	941	941
Adjusted R^2	0.173	0.064	0.182	0.182	0.462	0.681	0.802	0.800

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Columns 1-4 have linear specifications
Columns 5-8 have log-log specifications

Table 3 Italy-specific Regressions

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant (β_0)	-247960	1332366	334880	376984	15.9***	-12.7***	-10.8***	-6.93***
	(197853)	(149036)	(233151)	(249244)	(1.19)	(1.17)	(1.28)	(1.47)
GDPPC	***55.5		***47.9					
	(8.76)		(8.81)					
log(GDPPC)						1.90***	1.96***	
						(0.0759)	(0.0769)	
GDPPC(-1)				47.8***				
				(9.42)				
log(GDPPC(-1))								1.74***
								(0.0895)
DIST		-119	-97.4***	-106***				
		(22.0)	(21.7)	(23.6)				
log(DIST)					-1.14***	-0.879***	-1.01***	-1.06***
					(0.0914)	(0.0487)	(0.0566)	(0.0682)
POP	0.000468	0.000177	0.000777*	0.000801*				
	(0.0004)	(0.0004)	(0.0004)	(0.0004)				
log(POP)					0.396***	0.788***	0.899***	0.769***
					(0.0515)	(0.0350)	(0.0369)	(0.0436)
POPDEN	-0.0478	0.0128	-0.0209	-0.0139				
	(0.0386)	(0.0393)	(0.0385)	(0.0422)				
log(POPDEN)					-0.0990*		-0.198***	-0.207***
					(0.0564)		(0.0350)	(0.0424)
REXCH	93.3	109	70.7					
	(168)	(172)	(166)					
log(REXCH)					0.0646***	0.0234*	0.0178	
					(0.0195)	(0.0120)	(0.0122)	
REXCH(-1)				164				
				(178)				
log(REXCH(-1))								0.0216
								(0.0147)
N	363	363	363	363	363	363	363	363
Adjusted R^2	0.085	0.063	0.126	0.124	0.334	0.726	0.747	0.675

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Columns 1-4 have linear specifications
Columns 5-8 have log-log specifications

Table 4 Morocco-specific Regressions

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant (β_0)	-8560 **	40079***	16525***	17397***	2.21***	12.5***	2.59***	2.87***
	(4291)	(5653)	(6161)	(6657)	(0.633)	(0.862)	(0.639)	(0.668)
GDPPC	2.48***		2.44***					
	(0.274)		(0.272)					
log(GDPPC)					1.24***	0.997***	1.20***	
					(0.028)	(0.0486)	(0.0329)	
GDPPC(-1)				2.56***				
				(0.296)				
log(GDPPC(-1))								1.19***
								(0.0341)
DIST		-4.89***	-4.58***	-4.76***				
		(0.830)	(0.820)	(0.887)				
log(DIST)					-1.63***	-1.24***	-1.61***	-1.61***
					(0.053)	(0.0745)	(0.0507)	(0.0528)
POP	0.00002	0.00004**	0.00005***	0.00005***				
	(0.00002)	(0.00002)	(0.00002)	(0.00002)				
log(POP)					0.695***		0.731***	0.728***
					(0.0208)		(0.0206)	(0.0215)
POPDEN	-0.00319***	0.00014	-0.00158	-0.00157				
	(0.00105)	(0.00108)	(0.00107)	(0.00115)				
log(POPDEN)					-0.278***	-0.268***	-0.339***	-0.346***
					(0.0224)	(0.0325)	(0.0217)	(0.0227)
REXCH	1038	2108 ***	479					
	(564)	(546)	(568)					
log(REXCH)						0.0827***	0.0693***	
						(0.0231)	(0.0154)	
REXCH(-1)				282				
				(617)				
log(REXCH(-1))								***0.0687
								(0.0160)
N	919	919	919	919	919	919	919	919
Adjusted R^2	0.094	0.052	0.121	0.120	0.759	0.523	0.788	0.787

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Columns 1-4 have linear specifications
Columns 5-8 have log-log specifications

Table 5 United States-specific Regressions

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant (β_0)	-21753	1791927***	1407820***	1369603***	17.2***	10.4***	10.4***	10.7***
	(72813)	(140438)	(157916)	(161247)	(1.19)	(0.709)	(0.720)	(0.744)
GDPPC	43.9***		33.0***					
	(5.19)		(5.17)					
log(GDPPC)					1.12***	1.26***	1.19***	
					(0.0495)	(0.025)	(0.0294)	
GDPPC(-1)				33.5***				
				(5.35)				
log(GDPPC(-1))								1.18***
								(0.0300)
DIST		-158***	-145***	-141***				
		(13.8)	(14.3)	(14.5)				
log(DIST)					-2.07***	-2.61***	-2.47***	-2.49***
					(0.109)	(0.0641)	(0.0653)	(0.0152)
POP	-0.000736**	0.001***	0.00111***	0.0011***				
	(0.0003)	(0.0003)	(0.0003)	(0.0003)				
log(POP)						0.728***	0.698***	0.701***
						(0.0146)	(0.0149)	(0.0191)
POPDEN	-0.0547***	0.0141	-0.0134	-0.0145				
	(0.0200)	(0.0194)	(0.0198)	(0.0203)				
log(POPDEN)					0.161***	0.0734***	0.0691***	0.0725***
					(0.0310)	(0.0183)	(0.0185)	(0.0675)
REXCH	-46535	150892*	-12769					
	(84030)	(77448)	(81737)					
log(REXCH)					-0.417*		0.0348***	
					(0.0219)		(0.0131)	
REXCH(-1)				-16250				
				(83803)				
log(REXCH(-1))								0.0382***
								(0.0135)
DUM								
TR								
N	1124	1124	1124	1124	1124	1124	1124	1124
Adjusted R^2	0.058	0.100	0.133	0.131	0.534	0.848	0.837	0.840

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Columns 1-4 have linear specifications
Columns 5-8 have log-log specifications

Table 6 United States-specific Regressions (continued)

Variable	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant (β_0)	1420674***	10.4***	10.6***	1427632***	10.5***	1406571***	10.5***
	(161998)	(0.712)	(0.736)	(172769)	(0.712)	(178966)	(0.713)
GDPPC	33.1***			33.1***		33.1***	
	(5.17)			(5.18)		(5.18)	
log(GDPPC)		1.19***			1.19***		1.19***
		(0.0291)			(0.0291)		(0.0291)
GDPPC(-1)							
log(GDPPC(-1))			1.19***				
			(0.0298)				
DIST	-145***			-145***		-145***	
	(14.3)			(14.3)		(14.4)	
log(DIST)		-2.45***	-2.48***		-2.45***		-2.45***
		(0.0646)	(0.0151)		(0.0647)		(0.0647)
POP	0.00111***			0.00111***		0.00111***	
	(0.0003)			(0.0003)		(0.0003)	
log(POP)		0.699***	0.702***		0.698***		0.700***
		(0.0147)	(0.0189)		(0.0147)		(0.0147)
POPDEN	-0.0135			-0.0135		-0.0134	
	(0.0199)			(0.0199)		(0.0199)	
log(POPDEN)		0.0692***	0.0727***		0.0694***		0.694***
		(0.0183)	(0.0669)		(0.0183)		(0.0183)
REXCH	-12772			-12768		-12932	
	(81767)			(81814)		(81805)	
log(REXCH)		0.0356***			0.0357***		0.0357***
		(0.0130)			(0.0130)		(0.0130)
REXCH(-1)							
log(REXCH(-1))			0.0390***				
			(0.0133)				
DUM	-33980***	-0.289***	-0.276			-64308	*-0.189
	(94855)	(0.563)	(0.0579)			(188839)	(0.112)
TR				-3346	-0.454***	5713	-0.0187
				(15483)	(0.00917)	(30753)	(0.0183)
N	1124	1124	1124	1124	1124	1124	1124
Adjusted R^2	0.131	0.840	0.843	0.132	0.840	0.131	0.840

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Columns 9, 12 and 14 have linear specifications
Columns 10, 11, 13 and 15 have log-log specifications

APPENDIX A

Variable Descriptions

ARR: The number of arrivals of international tourists (measured in ones) from country i to country j in year t.
Source: WDI (World Development Indicators), WTO (World Tourism Organization).

DIST: The distance between country i and country j, measured in kilometers based on the middle-most point of each country.
Source: Map Crow Travel Distance Calculator

GDPPC: Gross domestic product per capita in country i in year t, measured in constant 2000 international dollars at purchasing price parity
Source: UNCDB (United Nation's Common Database), WDI (World Development Indicators)

POP: The population of country i in year t, measured as the country's total population.
Source: WDI (World Development Indicators)

POPDEN: The population density of country i in year t, measured as the country's total population divided by the country's total area (in thousands of square miles).
Source: WDI (World Development Indicators), Frankel and Romer

EXCH: The real exchange rate between country i and country j in year t, measured in [(US$ per national currency, period average)*($P_{\text{price level in destination}}$)] / [($P_{\text{price level in origin}}$)]
Source: IMF (International Monetary Fund), UNCDB (United Nation's Common Database)

APPENDIX A (continued)

Descriptive Statistics

Table A.1 Descriptive Statistics China:

	ARR	DIST	GDPPC	POP	POPDEN	REXCH
Mean	528977	10007	9015	34547666	602653	2.52
Median	2806	9508	5204	6943600	169167	0.613
Maximum	70193786	19849	57016	1.30E+09	21709000	25.0
Minimum	8	723	460	28000	1691	0.000347
Std. Dev.	4635342	4176	9500	1.28E+08	225915	4.24

Table A.2 Descriptive Statistics Egypt:

	ARR	DIST	GDPPC	POP	POPDEN	REXCH
Mean	39399	6001	9016	34547666	602653	1.95
Median	3414	4462	5204	6943600	169167	0.498
Maximum	1010444	18313	57016	1.30E+09	21709000	20.9
Minimum	3	680	460	28000	1691	0
Std. Dev.	109030	4106	9500	1.28E+08	2259156	3.29

Table A.3 Descriptive Statistics Italy:

	ARR	POP	GDPPC	DIST	POPDEN	REXCH
Mean	739861	86082972	17822	4624	662712	213
Median	109142	22054283	17853	2138	217311	0.608
Maximum	13163544	1.30E+09	57016	18456	17359000	4410
Minimum	1645	175660	2106	336	1691	6.75E-05
Std. Dev.	1911804	2.23E+08	11081	4475	2438818	589

Table A.4 Descriptive Statistics Morocco:

	ARR	DIST	GDPPC	POP	POPDEN	REXCH
Mean	17005	6179	9015	34547666	602653	2.72
Median	938	5586	5204	6943600	169167	0.669
Maximum	1337204	18886	57016	1.30E+09	21709000	26.6
Minimum	2	876	460	28000	1691	0.000398
Std. Dev.	80201	3853	9500	1.28E+08	2259156	4.57

Table A.5 Descriptive Statistics United States:

	ARR	DIST	GDPPC	POP	POPDEN	REXCH
Mean	290412	9747	9015	34547666	602653	0.353
Median	11244	9693	5204	6943600	169167	0.089
Maximum	15301000	17277	57016	1.30E+09	21709000	3.43
Minimum	6	1881	460	28000	1691	5.27E-05
Std. Dev.	1464091	3383	9500	1.28E+08	2259156	0.59