A META-ANALYSIS OF INTERNATIONAL TOURISM DEMAND ELASTICITIES

Keywords: tourism demand elasticities, data characteristics, study features, meta-analysis

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Abstract: This study uses meta-analysis to examine the relationship between estimated international tourism demand elasticities and the data characteristics and study features which may affect such empirical estimates. By reviewing 195 studies published during the period 1961-2011, the meta-regression analysis shows that origin, destination, time period, modeling method, data frequency, the inclusion/omission of other explanatory variables and their measures, and sample size all significantly influence the estimates of the demand elasticities generated by a model. Moreover, the demand elasticities at both product and destination levels are generalized by statistically integrating previous empirical estimates. The findings of this meta-analysis will be useful wherever an understanding of the drivers of tourism demand is critically important.

Keywords: tourism demand elasticities, data characteristics, study features, meta-analysis

INTRODUCTION

The last five decades have seen a rapid increase in worldwide tourism demand. As a result, international tourism has become increasingly important for worldwide economic development. Both the public and private sectors have channeled substantial resources into the industry. Furthermore, as both governments and businesses need high-quality tourism demand analysis to develop efficient public policy and make good business decisions, considerable efforts have been made to analyze tourism demand and develop explanatory models which help to inform these critical decisions.

Several variables have been suggested as the leading determinants of international tourism demand. However, the estimated demand elasticity of each determinant has been found in previous research to vary significantly across studies which have estimated elasticities empirically. How much of this variation is due to different data measurements, estimation methods, origins and destinations, and other study features and characteristics, and how much of the variation arises from inherent cultural and situational factors is unclear. Some researchers have tried to investigate the general effects of income and price on international tourism demand based on demand theory. These studies have partially succeeded in synthesizing the demand elasticities of aggregate demand, but have failed to analyze disaggregated demand. Past meta-analyses (Crouch, 1992, 1995, 1996; Lim, 1997, 1999; Brons et al., 2002) of tourism demand focus mainly on evaluating the single effect of either data characteristics or study features on estimates of tourism demand elasticities. No study so far has tried to explore the interactive effects of the two factors combined. Further, in the past 10 to 20 years a considerable number of additional demand studies have accumulated producing a much larger set of estimated demand elasticities. This current study sets out to fill these gaps and to cover the full set of results available to date.

Through a comprehensive review and integration of 195 articles on tourism demand modeling over the period 1961-2011, this study sets out to identify whether there is any association between the estimated international tourism demand elasticities and data characteristics/study features, and how much of this explanatory

noise can be eliminated in order to remove some of the 'fog' which obscures the generalizability of the results. An attempt will be made to compare the magnitudes of the impacts of the influencing factors of tourism demand across studies. Through generalizing the demand elasticities at a disaggregated level, it will help to enhance our understanding of tourist behavior and the diversification of tourists' tastes, and also help in the development of more effective international tourism forecasts, and development and investment strategies including public policy, marketing programs, and efforts to maintain and enhance destination competitiveness.

LITERATURE REVIEW

The identification, analysis and measurement of the impacts of the determinants of tourism demand are central to any effort to understand and explain changes in demand in the past and to anticipate the possible pathways of future tourism demand development. A number of variables have generally been examined and accepted in previous research as the main determinants of international tourism demand. However, significant distinctions can be drawn between the influences of different determinants for different visit purposes. For example, Turner and Witt (2001) show that the volume of international trade is closely associated with business tourism demand, but that the volume of retail sales is more closely associated with the demand for holiday tourism, and the demand for visits to friends and relatives (VFR) is linked more to overall gross domestic product (GDP).

Income in source markets has been demonstrated in past research to be a dominant explanatory variable and is the most widely discussed determinant of international tourism demand. Most researchers employ either nominal or real GDP or gross national product (GNP), or their per capita forms, as a suitable measure of tourists' income (see for example Greenidge, 2001; and Turner and Witt, 2001). Other less commonly used measures of income include real consumption per capita (Dritsakis, 2004), superfluous income which is defined as real disposable income less expenditure on food, housing, fuel, and power (Edwards, 1979), foreign travel budgets (Smeral and Witt, 1996), industrial production indices (Gonzalez and Moral, 1995), and real household disposable income (Lim, 1997).

Most of the empirical studies demonstrate that, in accordance with economic theory, income has a positive effect on tourism demand. They also conclude that international tourism is a luxury product as indicated by the fact that most studies have estimated an income elasticity of demand exceeding the value of 1.0 which shows that, as income rises, tourism consumers spend an increasing proportion of their income on international travel. According to a meta-analysis of 1,501 estimates by Crouch (1996), the mean income elasticity was found to be 1.86, with a standard deviation of 1.78. Crouch (1992) also suggested that different estimates arise depending on the different income measures employed (e.g., total income versus per capita income). When holiday visits or VFR travel are under consideration, the more appropriate form of the income variable is private consumption or personal disposable income, while a general income measure is more appropriate for business visits.

Moreover, income elasticity may differ considerably across different origin-destination pairs. For example, the estimated income elasticity of the demand for Aruba tourism varies from 1.43 for US tourists to 2.52 for Dutch visitors (Croes and Vanegas, 2005). By contrast, Naude and Saayman (2005) show that the level of income in origin countries has little effect on the demand for tourism in Africa.

The relative price of tourism is another important determinant of demand. Estimated price elasticities are nearly always negative demonstrating that rising prices deter demand. The consumer price index (CPI) of the destination country divided by the CPI of the origin country is the most frequently used proxy variable to capture relative price effects. Some studies opt to use specific tourism price variables, such as service price indexes (Cheung and Law, 2001), hotel price indexes (Narayan, 2004) or the weighted prices of food, accommodation, transport, entertainment, and other services (Dwyer, Forsyth and Rao, 2000). Exchange rates are also often used to adjust relative prices or may be included in the demand model as a separate variable on the basis that tourists may display different sensitivities to actual price changes versus variations in exchange rates (Webber, 2001; Croes and Vanegas, 2005; Mangion, Durbarry and Sinclair, 2005). Tourists tend to be more aware of exchange rate changes before they travel than they are of inflationary effects in the destination they plan to visit.

Transportation costs can account for a large proportion of tourism expenditure, and are often measured by the cost of air travel (Turner and Witt, 2001), travel distance, and gasoline costs (Martin and Witt, 1988). However, studies using travel

exports/imports as a dependent variable do not fully support the idea that international tourism demand is inversely related to transport costs (Lim, 1999). According to Crouch's (1996) meta-analysis, the price elasticity of tourism demand has a mean value of -0.63, with a standard deviation of 2.32. He attributes this variation principally to sampling errors. Furthermore, price elasticities vary considerably among different origin-destination country pairs (Mangion et al., 2005) and by trip purpose (Sakai, 1988; Lehto, Morrison and O'Leary, 2001). Data frequency, the number of explanatory variables in the models, and their definitions are also believed to influence the various elasticity estimates (Crouch, 1992, 1996).

Other potentially significant determinants that have been discussed in previous studies include: prices in substitute or alternative destinations, which could be measured by domestic CPI or a weighted tourism price for a set of substitute destinations (Witt and Witt, 1995; Song and Wong, 2003); the size of the population within the origin (Witt and Martin, 1987a; Turner and Witt, 2001); trends in immigration patterns (Seetaram and Dwyer, 2009); destination promotional expenditure which, if effective, ought to stimulate tourism demand (Crouch, Schultz and Valerio, 1992); changes in tourists' tastes, which could be captured by time trends; seasonal variations (Lim, 2004); climate change (Lise and Tol, 2002); political instability (Dhariwal, 2005; Naude and Saayman, 2005); foreign direct investment, which relates mainly to business travel (Tang, Selvanathan and Selvanathan, 2007); the educational level of tourists and their age distribution (Alegre and Pou, 2004); rates of unemployment (Cho, 2001); the levels of income distribution and inequality

(Morley, 1998); one-off events such as acts of terrorism or infectious disease scares (Song and Lin, 2010; Smeral, 2010); and the lagged effects of both explanatory variables as well as the dependent variable itself which can be an indicator of the strength or durability of habit persistence in travel preferences.

HYPOTHESES

Previous work supports the idea that the estimates of demand elasticities are related to the characteristics of the data used and also to the key features of each study, such as data frequency, alternative measures of demand, the particular origins and destinations under study, and travel distance (Crouch, 1992, 1996; Song et al., 2009a). In this section, a series of hypotheses will be developed to explore the effects of data and study characteristics on estimates of income and own-price elasticity.

Under the influence of different economic conditions and cultural and customer habits, the income and price sensitivities of tourists from different origins would be expected to vary. Crouch (1996) used dummy variables to test the effects of different origins and destinations on the estimated demand elasticity of international tourism and found that the country dummies were statistically significant. He found tourists from developed regions tend to view international tourism as less of a luxury than those from less-developed countries. Tourists from countries where international travel is common are likely to be less sensitive to income and price changes. Living in countries with large geographic areas, tourists tend to have more options for holidaying within their national boundaries, and may therefore be more sensitive to

changes in the price of international tourism, everything else being equal (Little, 1980). Therefore, we hypothesize that *the estimated income and price elasticities of international tourism demand vary by source market (H_{1a} & H_{1b}).*

The characteristics of a destination may influence its uniqueness and popularity and, as a consequence, the income and own-price elasticities of tourism demand. Based on demand theory, income elasticity ought to be lower for destinations regarded as less of a luxury. Anastasopoulos (1984) pointed out that the absolute value of the price elasticity is lower for more unique destinations. For destinations with many substitutes and competitors, price competition tends to be intense and there is likely to be greater sensitivity to price indicative of the greater opportunity to switch between alternative destinations. Therefore, we hypothesize that *the estimated income and price elasticities of international tourism demand vary by the destination concerned (H_{2a} & H_{2b}).*

Analyses conducted to estimate demand elasticities over different time periods are likely to result in different estimates as there is no reason to expect elasticities to be time invariant. During periods of economic prosperity, tourists are more likely to travel and to be less sensitive to income and price changes. During a recession, personal wealth is reduced and income elasticity may increase. Price competition is also very common during economic crises, resulting in higher than normal price elasticity (Song and Lin, 2010). Therefore, we hypothesize that *the estimated income and price elasticities of international tourism demand vary according to the time period covered by the data (H_{3a} & H_{3b}).*

The structure and characteristics of different estimation models may influence the estimates of demand elasticities. Traditional regression models assume that income and price elasticities are constant, while the time varying parameter (TVP) technique permits these parameters to vary over time (Song and Wong, 2003). Whether or not the model specification provides for behavioral changes by tourists over time, the estimated demand elasticities would be expected to change. Moreover, in the dynamic models, which include lagged dependent and independent variables, the effects of tourists' loyalty and "word of mouth" are able to be separately estimated. In these dynamic models, both long-run and short-run elasticities may be estimated. Therefore, we hypothesize that *the estimated income and price elasticities of international tourism demand vary according to the modeling methods used for the estimation (*$\boldsymbol{H_{4a}}$ & $\boldsymbol{H_{4b}}$*).*

The use of different data frequencies in demand studies is evidence that researchers have different concerns in terms of the time-dependent response to changes in the explanatory variables, and estimates of demand elasticity may vary depending on data frequency. Crouch (1996) suggests that the estimated income elasticities will increase with increased data frequency, and that price elasticity will also vary as a function of the time interval used. Hence, we hypothesize that *the estimated income and price elasticities of international tourism demand vary according to the frequency of data employed (*H_{5a} & H_{5b}*).*

Econometric studies show that the omission of relevant variables in a regression model may bias the estimated coefficients of the other explanatory variables (Gujarati,

2003, p.508-509). The magnitude of such bias will depend on the relationship between the omitted variable, the dependent variable, and the other explanatory variables. Economic variables, such as income, own price, substitute prices, exchange rates and travel costs, are often collinear. Accordingly, we hypothesize that *the omission of explanatory variables will bias the estimates of income and price elasticities of international tourism demand (*H_{6a} & H_{6b}*).* For the same reason, we hypothesize that *the estimated income and price elasticities of international tourism demand vary according to the absolute number of explanatory variables included in the estimation model (*H_{7a} & H_{7b}*).*

Keele and Kelly (2006) show that the inclusion of a lagged dependent variable may affect the estimates of the coefficients of the other explanatory variables in the model. Since the lagged dependent variables in a model are likely to be correlated with the other explanatory variables, the length of the lags may influence the estimates of demand elasticities. Therefore, we hypothesize that *the estimated income and price elasticities of international tourism demand vary according to the lag length of the (lagged) dependent variable in the model (*H_{8a} & H_{8b}*).*

Since travel costs can account for a major part of tourism expenditure, it is to be anticipated that tourism consumers would regard long-haul tourism as more of a luxury compared to short-haul tourism and that this difference would show up in estimated elasticities of demand. Even with the advent of low-cost carriers, travel costs usually still increase with distance traveled. Therefore, long-haul tourism is usually more expensive and has higher income elasticity than short-haul tourism.

However, Anastasopoulos (1984) suggests that as long-haul tourists tend to come from more wealthy regions, they may therefore be less income sensitive, potentially offsetting this effect. Turning to price elasticity, long-haul tourists are less sensitive to price changes than short-haul tourists, according to Crouch (1994b) and Brons et al. (2002). This may be because of the more exotic, unique features of such destinations and therefore the lack of available substitutes. Therefore, we hypothesize that *the estimated income and price elasticities of international tourism demand vary according to travel distance (H_{9a} & H_{9b}).*

Tourism demand has been measured in a variety of ways in previous research, with some studies even using more than one dependent variable to represent demand. By reviewing studies published between 1961 and 2004, Crouch (1994a), Lim (1997) and Li et al. (2005) summarize four demand measures that are commonly used. These include the number of tourist arrivals, the quantity of tourist expenditure/receipts, length of stay, and the number of nights spent at tourist accommodation. Of these measures, tourist arrivals and expenditure and their derivatives (such as arrivals and receipts divided by population of the origin) are the most frequently used in the demand modeling literature. The different measures of tourism demand may be expected to influence the estimates of demand elasticities. With the progressive development and promotion of international tourism, and the overall decline in the real cost of such travel, more and more people now travel internationally. Travel attitudes and habits have therefore changed and evolved over time. As a result tourism has become a much more common experience for a growing number of people who

regard international travel as an experience they are now more habituated to. Instead of reducing the number of trips taken, tourists may tend to reduce their expenditure per trip or length of stay in response to declining economic or other adverse conditions. Therefore, we hypothesize that *the estimated income and (absolute values of the) price elasticities of international tourism demand are higher when demand is measured by expenditure/receipts than by other means (H_{10a} & H_{10b}).*

As well as using total tourism demand data, some researchers have employed disaggregated data to examine tourist demand at the product level, including accommodation, dining, and shopping. Law and Au (2000) conclude that income and price elasticities vary significantly across classes of tourism products. It is therefore expected that *the estimated income and price elasticities of international tourism demand may vary according to the level of aggregation in international tourism demand measurement (H_{11a} & H_{11b}).*

Income in the origin, as the most commonly used determinant of international tourism demand, can be expressed in either aggregate or *per capita* form. As population and income both tend to increase over time, aggregate income rises faster than per capita income. Hence demand should be more responsive to per capita changes. Therefore, we hypothesize that *the estimated income elasticities of international tourism demand are higher when the income variable is measured in per capita form（H_{12a}）.*

The year in which the research is published may be analyzed as a proxy measure of any time trend in tourism demand sensitivity. With the growth in consumer

incomes and the declining real cost of air travel, international tourism has become more common worldwide and therefore less of a luxury, so income elasticities may have declined over time as a result. With the development of the tourism industry, more destinations are emerging and tourists have more channels than before through which to access information about them. As tourists have more choices and have become more aware of tourism costs, the absolute values of the estimated price elasticities in more recent studies are likely to be higher than was found in studies published in the past covering older data. Therefore, we hypothesize that *the estimated income elasticities of international tourism demand have a negative relationship with the year of publication of the study (H_{13a}) and the (absolute values of the) estimated own-price elasticities of international tourism demand have a positive relationship with the year of publication of the study (H_{13b}).*

The data sample size has been shown to be correlated with the estimates of coefficients (Glass et al, 1981). Crouch (1992) shows that estimated demand elasticities vary significantly across different sample sizes. Therefore, we also hypothesize that *the estimated income and price elasticities of international tourism demand vary according to the sample size (H_{14a} & H_{14b}).*

Tourists usually plan international travel several weeks or months ahead. In the short term, their response to income and price changes may be constrained by existing travel arrangements. However, in the long run, they have enough time to fully adjust their behavior and are likely to display more income and price elastic behavior. Therefore, we hypothesize also that *the estimated long-run income and (absolute)*

price elasticities of international tourism demand are higher than the short-term estimates (H_{15a} & H_{15b}).

METHODOLOGY

Meta-analysis techniques are applied to examine the impact of data characteristics and study features on the demand elasticities for international tourism. Meta-analysis has the power to generate a true effect size through a comprehensive and systematic review of the findings from past studies, which improves the validity of the conclusions and is helpful in explaining variations across studies. The application of meta-analysis in tourism demand analysis has so far been very limited. The only studies are those by Crouch (1992, 1995, 1996), Lim (1997, 1999) and Brons et al. (2002). However, in many other fields, meta-analysis is a widely used technique for synthesizing results across a large number of other empirical studies in order to identify the degree of consensus and disagreement in their findings, and thereby to generalize overall conclusions.

The first step of any meta-analysis is to locate as many relevant empirical studies as possible. Google Scholar was first used to find articles containing at least one of the expressions “tourism demand” or “tourism modeling” over the time period 1961-2011. This time period was selected for two reasons. Firstly, 1961 was the year in which the earliest known work that included international tourism demand elasticity estimates was published (Guthrie, 1961). Secondly, the aim was to extend the sample size to include most if not all of the published studies that reported

international tourism demand elasticity estimates, so that a more comprehensive and up-to-date meta-analysis could be carried out compared to previous studies. Google Scholar was selected as the search engine mainly for its comprehensive coverage of English-language articles in various disciplines and its reputation among academics. Following the primary website search, referencing and footnote chasing was used to ensure the comprehensiveness of the articles identified. After identifying potential sources, some studies were rejected according to the following exclusion criteria: 1) the article did not report empirical estimates of income or own-price elasticities; 2) the article was not written in English; or 3) the article reported demand elasticities which had already been included in the data set (to avoid double counting of the estimated demand elasticities). The final set of articles included in this study are summarized in Table 1, together with the number of estimated demand elasticities available from each.

(Insert Table 1 here)

For the purpose of our meta-analysis, we used a regression technique (meta-regression hereafter) in order to identify and evaluate simultaneously the effects of the independent variables on the dependent variables. The estimated own-price and income elasticities become the dependent variables, whereas the various data characteristics and study features outlined above represent the independent or explanatory variables. Following the process suggested by Sargan (1964), if

$S = \left(\frac{\sqrt{\sum_{i=1}^{n} \hat{\varepsilon}_{1i}^2}}{\sqrt{\sum_{i=1}^{n} \hat{\varepsilon}_{0i}^2}} \right)^n$, where $\hat{\varepsilon}_1$ is the residual from the simple linear regression; $\hat{\varepsilon}_0$ is

the residual from the single log-linear model; and $\dot{y}$ is the geometric mean of the dependent variable $y_1, y_2 \cdots \cdots y_n$, then if *S* is greater than 1, the single log-linear regression model is preferred. According to this criterion, both of the income and price elasticity models were found to be best represented in the form of single log-linear regressions. In particular the meta-regression model in this study can be specified as follows:

$$logY = \beta X + C + \mu$$

where Y refers to the reported income or own-price elasticity of international tourism demand; *X* is a matrix of explanatory variables; β is the parameter matrix to be estimated, indicating the fractional change of *Y* in response to a one unit change in *X*; *C* is the intercept vector; and μ refers to the residual vector. The explanatory variables include continuous variables, such as year of publication, number of variables included in the study, lag length of the dependent variables and sample size; and a set of dummy variables. To avoid the invalidity of statistical tests caused by the heteroskedasticity, the weighted least squares method is applied in the parameter estimation, assuming that the error term is the normal distributed.

Dummy variables were used to analyze the effect of the various categorical and ordinal variables. The dummy variables that capture the effects of the source markets and destination regions are defined for both origins and destinations as a series of five 0-1 dummies, using a sixth other destination/origin category as the dummy comparison benchmark, where each takes the value of 1 if the estimated elasticity is associated with the origin/destination concerned, or 0 otherwise. The five dummies

are associated with Europe, America, Oceania, Asia or Africa. The benchmark category covered these studies that did not specify the origin and destinations. Hence, 5 dummy variables capture the influence of the origin and likewise 5 also capture destination effects. With regard to the year of study, there were four separate dummies each taking the value of 1 if the study was conducted respectively in either the 1970s, 1980s, 1990s or 2000s, and 0 if not. By omitting a dummy for estimates from other than one of these four periods, the regression coefficient therefore uses the period before 1970 as the comparison benchmark. Two dummy variables were used to model the data frequency. Each of these took the value of 1 respectively if either monthly or quarterly data were used and 0 otherwise. As no dummy was used for annual data, the regression coefficient for the two dummies can therefore be interpreted in comparison with the annual benchmark. Similarly, two dummies were used to model the three modeling methodology categories with 'static econometrics' as the benchmark category; the dummies take the value of 1 if the study used either the advanced time series, or alternatively the dynamic econometric models, and 0 if the other two models were used. The omission of explanatory variables from the estimation models was analysed using five further dummy variables for each of income, own-price, substitute-price, exchange rate, and travel cost. The benchmark for these dummies was the case where all five of these variables were included. One dummy was used to model the effect of travel distance by representing the effect of inter-continental tourism demand analysis compared to intra-continental (or not specified) travel. Three further dummies, each with their own benchmark, were used

to assess the effect that the method of defining and measuring the demand variable had on the resulting elasticity estimates. These three dummies considered whether or not demand was measured in the form of tourist expenditure (where not this was commonly tourist numbers), whether the demand measured a particular product type or was instead aggregate demand to the destination, and whether or not the demand was in per capita form. Finally, one dummy was used to model the adjustment period (set to 1 for short-run estimates against a benchmark of long-run estimates).

The meta-regression estimations follow the general-to-specific process (see the detailed explanation in Song and Witt, 2003), in which variables that are insignificant at the 5% level or contradict economic theory are removed until all the remaining coefficients in the models are significantly different from zero and consistent with theoretical restrictions.

A further task is to generalize the elasticities at the product or origin/destination level. As few studies reported the variance of the estimates, only a simple average for the elasticities is summarized. The mean elasticities for different data groups are also summarized.

DATA DESCRIPTION

A comprehensive search of the literature generated 702 articles on international tourism demand analysis. Based on the selection criteria, 195 studies were selected for the meta-analysis comprising a total of 2,833 estimated demand elasticities (1,633 income elasticities and 1,203 own-price elasticities). Since the single log-linear

meta-regression model is to be preferred in this analysis, as noted above, the application of this specification to the data requires only positive values of Y. In the case of the estimated own-price elasticities which are expected to be negative, and indeed were for all but 8% of the estimates, non-negative estimates were excluded from the analysis in order to facilitate the meta-regression as well as to accord with theoretical expectations. The sources and distribution of these estimates are summarized in Table 1.

Tables 2 and 3 profile each dataset. European countries are the most frequently studied source markets for international tourism. In total, 695 estimates (42.6%) of income and 495 (41.1%) of price elasticities were related to European tourists. Only 7 studies (12 estimates) analyzed the income elasticities of African tourists, with 5 studies (11 estimates) reporting price elasticities.

The most studied destination regions were Asia and Europe. Income elasticity estimates of tourists traveling to Asia and Europe account for 593 (36.3%) and 472 (28.9%) values, respectively. Own-price elasticity estimates for Asia and European destinations account for 373 (31.0%) and 368 (30.6%) values, respectively. In terms of travel distance, inter-continental tourism commonly defines long-haul tourism and intra-continental tourism is normally regarded as short-haul tourism. There were more studies in the former category.

(Insert Tables 2 and 3 here)

Econometric modeling methods have dominated tourism demand analysis. Advanced time series models were used in only 8 studies (52 estimates) to estimate

income elasticities of international tourism demand and in only 6 studies (15 estimates) to estimate own-price elasticities. Dynamic and static econometric models featured in the studies approximately equally, with static econometric models dominating the pre-1995 literature. Dynamic econometric models developed quickly after that, with the autoregressive distributed lag model (ADLM) the most commonly used (293 income and 252 price elasticity estimates).

In terms of data frequency, 1,123 (68.8%) and 846 (70.4%) estimates of income and price elasticities, respectively, were generated using annual data. Yearly data was particularly common in studies conducted before the year 2000. Many studies analyzed international tourists' behavior at the destination level (76.1% for income elasticity and 67.3% for price elasticity). At the product level, accommodation, transportation, holiday tourism, and VFR tourism were the most frequently studied topics. Tourist arrivals and expenditure, and their *per capita* forms, were the most commonly used measures of tourism demand. Studies analyzing tourist arrivals accounted for 64.9% and 67.1% of all estimates of income and price elasticities, respectively. The second most popular demand measure was tourism expenditure, leading to 349 (21.4%) and 230 (19.1%) estimates of income and price elasticities, respectively.

META-REGRESSION

The results of the two meta-regressions are presented in Table 4. In the case of the various dummy variables discussed earlier, the category selected as the

comparator is denoted by the term 'benchmark'. The adjusted R^2 indicates that the regression models were successful in explaining 23.0% of the variation in estimated income elasticities and 14.7% of the variation in the estimated own-price elasticities. In the context of the meta-analysis literature, such R^2 values suggest reasonably typical degrees of fit of the data to the meta-regression models.

(Insert Table 4 here)

The results of the regression analyses show that both the origin and the destination concerned across the study estimates help to explain a significant portion of the variance in both estimated income and own-price elasticities. In particular, the demand for international tourism by European tourists tends to have much higher income elasticities than by those from other source markets (32.1% higher than the world level). This may be a cultural difference in income sensitivity to international travel, or it may possibly reflect differences arising from the type of destination which Europeans tend to prefer. Asian and African countries and Oceania, as tourism destinations, tend to be associated with lower income elasticities. This could be indicative of perceived luxury. Alternatively, as travel to these locations is more likely to be seen to be something tourists from other countries might only do once, changes in income levels may have limited impacts on once-in-a-lifetime desires.

Compared to tourists from other origins, tourists from Asia and America are more sensitive to price changes in tourism products. Meanwhile, as destinations, Asian, American, and European locations are associated with higher price sensitivities. This result may be indicative of differences in the number of substitutes or

competitors leading to higher price elasticities (Little, 1980).

The estimated coefficients associated with the dummy variables accounting for the time periods of the data coverage all have significant influences on the estimates of income elasticities. The different signs and values of the coefficients show that the demand elasticities have varied considerable over the past 50 years. This may be due to fluctuations in worldwide economic activity and changes in people's expectations of their income and job situation (Smeral, 2012). This finding also indicates that when estimation models are forced to assume constant income elasticities, estimation error is likely to be greater. However, only the dummy variable for the 1980s was found to be significant in the regression model of price elasticity estimates, which indicates that this parameter has changed little over the decades. The price elasticity in the 1980s was found to be significantly higher compared to the other periods. This may be a product of the oil crisis at the end of the 1970s (Martin and Witt, 1987; Lim and McAleer, 2002; Song, Witt and Jensen, 2003) or the global economic recession in the early 1980s. These results demonstrate that the estimated income and own-price elasticities of international tourism demand have not remained static.

The meta-regressions show that the estimated income elasticities of international tourism demand also depend on the modeling methods used. Compared to other methods, the dynamic econometric models tend to yield higher income elasticities (13.2% higher than the static models), while own-price elasticity seems instead to be constant across different approaches. This suggests that the complexity and temporal structure of the model will influence the elasticity estimates produced in the case of

income.

The income elasticity of tourism demand generated using monthly data is higher than that generated from quarterly and annual data. This indicates that the estimated income elasticities depend on data frequency. Again, however, this was not the case for price elasticity where no significant effect due to data frequency was found.

The regression results suggest that omission of the substitute-price variable in the demand model would have a negative impact, and omission of the exchange rate variable a positive influence, on the estimates of income elasticity. In the case of price elasticity, the omission of the income variable would have a positive influence, and the omission of the substitute-price and travel cost variables a negative impact. These findings support the hypotheses that omission of other potentially important explanatory variables can significantly influence the estimates of income and own-price elasticities.

The number of variables included in the regression model was found to have a negative influence on the estimates of income elasticity, but no significant effect on price elasticity. The regression results also show that the lag length of the dependent variables included in the models is likely to have a positive effect on estimates of the absolute value of the own-price elasticity. That is to say, the greater the lag effect of the dependent variable included in the model, the higher the absolute price elasticity which results. However, the hypothesis that the lag length of the dependent variable in the model would influence estimated income elasticities is not supported by these results.

The regression results demonstrate that the income elasticity for inter-continental tourism is significantly higher than that for intra-continental tourism. Consistent with economic theory, this indicates that long-haul travelers are more income sensitive than short-haul travelers. The results also show that the price elasticity of international tourism demand does not vary significantly with travel distance.

Somewhat unexpectedly, the meta-regression results show that, when tourist expenditure/receipts is used as the measure of international demand, a significant negative effect on estimates of income elasticity is likely to arise. However, with regard to price elasticity, the result supports the hypothesis that tourists' expenditure is more price elastic when measures involving expenditure/receipts are used. According to the regression results, income elasticity is not greatly affected as a function of whether demand for the whole destination or for specific products is considered. However, when considering the disaggregated international tourism demand for specific products, the means of the absolute price elasticities are significantly lower than for the destination as a whole. This may be because tourists have many potential substitutes when they choose a destination but may be loyal to specific products, such as airplane travel and luxury hotels. Another possible reason is that the articles studying disaggregated tourism products focus primarily on accommodation and transportation, which are necessities for most tourists. It was assumed that the estimated income elasticity of international tourism demand will be higher when the income variable is measured in *per capita* terms, but the results do not support this hypothesis.

The dummy variable for the short-run estimates shows that international tourists are less sensitive to income and price changes, consistent with expectations. Additionally, the income coefficient for the year of publication is negative, implying that in general international tourists' sensitivity to income has been gradually declining over the past 50 years. This, however, was not found to be the case for price sensitivity. Together, these two findings are quite consistent with a view that growth in international tourism has lead to a decrease in its luxury status, but the growing competition between destinations has resulted in an expansion in the number and range of alternative destinations available producing today more price sensitive tourists than in the past.

Sample size also has a significant influence on the estimates of income and price elasticities of international tourism demand, but the magnitudes of the coefficients are very small which suggests that the effects are rather limited.

To establish the reliability of the regression models reported above, several collinearity diagnostic tests were also carried out. The correlation matrices show that none of the bivariate correlation indexes are larger than 0.8, which indicates no strong linear association between any two variables in the model (Mason and Perreault, 1991). The VIF indexes for all the variables in the regressions are not significantly larger than 10, indicating no significant multicollinearity problem in those models (Marquardt, 1970).

CONCLUSION AND DISCUSSION

Income and own-price elasticities of international tourism demand reveal tourists' economic reactions and preferences toward travel in general and toward specific destinations. Such information provides a foundation for destination development planning and the design of marketing strategies. According to the meta-analyses reported and discussed above, the demand elasticities of international tourism vary significantly across different origins, destinations, products, data frequencies, demand variable measures, modeling methods, and in terms of travel distances. Understanding how and why differences in demand elasticities occur is essential if effective destination marketing strategies are to be formulated. To aid in this task, in tables 5 and 6 we summarize the average income and own-price elasticities of demand for each explanatory category based on the previous studies.

(Insert Tables 5 and 6 here)

The overall average income elasticity of international tourism demand is 2.526. This indicates that, on average, the majority of international travel is clearly in the 'luxury' category (economists define luxury products as those with income elasticities greater than 1.0). The overall average price elasticity was found to be -1.281.

European tourists had the highest income elasticity (3.419), with Africans (mainly South Africans) the lowest (1.147). Tourists who traveled to Asia showed the highest income elasticity (3.165), and the second-highest absolute price (-1.456) elasticity. Tourists to Oceania exhibited the lowest income elasticity (2.067) and were also the least price sensitive, with an average own-price elasticity of -0.844. The average income and price elasticities for each origin-destination pair, where data was

available, have also been calculated and are summarized in tables 7 and 8.

(Insert Tables 7 and 8 here)

In terms of modeling methods, the dynamic econometric models produced higher estimates of both income (3.093) and own-price elasticity (-1.415) than were produced by the static models. Studies using monthly data tended to generate higher income (6.454) and absolute price (-1.683) elasticities than those employing lower-frequency data. The income and price elasticities for models using quarterly data were 1.923 and -1.134, respectively.

Different tourism products also have significantly different demand elasticities. Among the products studied, accommodation, which is a necessity for most international tourists, has the lowest income (1.166) and absolute price (-0.727) elasticities. Studies that considered the destination as an aggregated tourism product tended to show the highest income and price elasticities.

The demand for international air travel is the main focus of studies on tourism transportation. Since the substitutes for most travel modes are limited, the average absolute price elasticity of transportation is relatively low (-0.920). Compared to holiday and VFR tourists, business tourism had an average income elasticity of 1.605 and an own-price elasticity of -0.350, which is the lowest of all three tourism products studied. Studies on the demand for medical tourism, although small in number, tend to exhibit much lower income and price elasticities than pleasure tourism. This may be due to the fact that tourists who traveled for medical purposes tended to be richer and their destinations have relatively cheaper but high-quality medical services.

Studies that analyzed tourist arrivals tended to generate greater income (2.724 for all arrivals and 3.160 for arrivals *per capita*) and lower absolute price (-1.240 for all arrivals and -0.749 for arrivals *per capita*) elasticities than studies examining expenditure. The findings on the effect of travel distance are consistent with previous studies which concluded that long-haul tourism is considered more of a luxury than short-haul tourism. The income elasticity for inter-continental tourism (3.188) is higher than that for intra-continental tourism.

Overall, the difference between the elasticity estimates for each subgroup indicates that tourists from different source markets, going to different destinations, and consuming different products have different sensitivities to income and price changes. Therefore, different marketing strategies should be applied in different markets. For example, American and Asian tourists were found to be the most sensitive to price changes, so a marketing strategy which emphasizes price may be appropriate. This is less of an issue for Oceania tourists, so in this case it would be better to emphasize the uniqueness of products in marketing activities directed at this group.

Demand elasticities also vary over time, so governments and tourism businesses should design their marketing strategies in response to changing markets and changing travel tastes and preferences. Furthermore, different modeling methods, data frequencies, and demand measures generate different estimates of elasticities, so governments and tourism enterprises should pay particular attention to the data and modeling features of relevant studies when examining the marketing implications.

Compared to the prior meta-analytical studies on international tourism demand, this study has greatly enlarged and updated the coverage of the relevant literature which has now accumulated over the past five decades. However, only published articles were included in the analysis. As scholarly journals are less likely to publish studies which produce results that are of low statistical significance or which run counter to prevailing wisdom, the inclusion of additional unpublished studies, such as working papers, PhD theses, and articles obtained through personal contacts, could be one way to improve the reliability and comprehensiveness of future meta-analytical studies. Moreover, due to the constraints of the sample, only the effects of origins and destinations at the continent level were evaluated in the regression. With an increase in the volume of published studies in the future, more fine-grained analysis may be possible. For example, the influences of origins and destinations at the country level, and specific customer segments could be analyzed in future research. Additionally, interaction effects between particular explanatory variables in the meta-regression may be possible. We have tested the interaction effects between tourism demand measures and other dummy variables, however, unfortunately, limited interactions are significant. With the increasing number of studies in tourism demand modeling, more interaction effects between explanatory variables could be discussed. There may also be some merit in furthering investigation into other explanations behind variations in estimated elasticities. For example, variations in estimates as a function of the time period might more closely examine time trends or the effects of significant international events on tourism. Given the wide range of differing contexts across

studies, this may be difficult to investigate at this point in greater detail until further future studies add significantly to the expanding dataset.

References

Aguiló E., A. Riera, and J. Rosselló (2005). "The Short-term Price Effect of a Tourist Tax Through a Dynamic Demand Model: The Case of the Balearic Islands." *Tourism Management*, 26(3): 359-365.

Akis S. (1998). "A Compact Econometric Model of Tourism Demand for Turkey." *Tourism Management,* 19(1): 99-102.

Alegre J. and L. Pou (2004). "Micro-economic Determinants of the Probability of Tourism Consumption." *Tourism Economics*, 10(2): 125-144.

Algieri B. (2006a). "An Econometric Estimation of the Demand for Tourism: The Case of Russia." *Tourism Economics*, 12(1): 5-20.

Algieri B. (2006b). "International Tourism Specialisation of Small Countries." *International Journal of Tourism Research*, 8(1): 1-12.

Algieri B. and S. Kanellopoulou (2009). "Determinants of Demand for Exports of Tourism: An Unobserved Component Model." *Tourism and Hospitality Research January*, 9(1): 9-19.

Anastasopoulos, G. (1984). "Interdependencies in International Travel: The Role of Relative Prices." A Case Study of the Mediterranean Reglon. PhD Thesis, New School for Social Research.

Anastasopoulos G. (1989). "The U.S. Travel Account: The Impact of Fluctuations of the U.S. Dollar." *Journal of Hospitality & Tourism Research,* 13(3): 469-481.

Asgary N., G.L. Santos, V. Vincent and V. Davila (1997). "The Determinants of Expenditures by Mexican Visitors to the Border Cities of Texas." *Tourism Economics*, 3(4): 319-328.

Bankole A. S. and M.A. Babatunde (2010). "Elasticities of Demand for Tourism in Nigeria: An Ardl Approach." *Tourism Analysis*, 15(4): 489-496.

Barry K. and J. O'Hagan (1972). An Econometric Study of British Tourist Expenditure in Ireland. *Economic and Social Review*, 3: 143-161.

Blackwell J. (1970). "Tourist Traffic and the Demand for Accommodation: Some Projections." *Economic and Social Review*, 1: 323-343.

Bond M. E., and J. R. Ladman (1972). "International Tourism and Economic Development: A Special Case for Latin America." *Mississippi Valley Journal of*

Business and Economics, 8: 43-55.

Bonham C., B. Gangnes and T. Zhou (2009). "Modeling Tourism: A Fully Identified VECM Approach." *International Journal of Forecasting*, 25(3): 531-549.

Botti L., N. Peypoch, R. Randriamboarison and B. Solonandrasana (2007). "An Econometric Model of Tourism Demand in France." *TOURISMOS,* 2(1): 115-126.

Brakke M. (2004). "International Tourism, Demand, and GDP Implications: A Background and Empirical Analysis. *Undergraduate Economic Review*, 1(1): 1-38.

Brida J. G. and W.A. Risso (2009). "A Dynamic Panel Data Study of the German Demand for Tourism in South Tyrol." *Tourism and Hospitality Research*, 9(4): 305-313.

Brida J.G., W.A. Risso and E. J. S. Carrera (2008). "A Long-run Equilibrium Demand Function: Tourism in Mexico." *TOURISMOS,* 3(1): 66-82.

Brons M., E. Pels, P. Nijkamp and P. Rietveld (2002). "Price Elasticities of Demand for Passenger Air Travel: A Meta-analysis." *Journal of Air Transport Management*, 8(3): 165-175.

Campbell T., and T.K. Mitchell (2007). "Determinants of Outbound Holiday Travel for Barbados." *Tourism Analysis,* 12(1-2): 77-82.

Carey K. (1989). "Tourism Development in LDCs: Hotel Capacity Expansion with Reference to Barbados." *World Development,* 17(1): 59-67.

Carey K. (1991). "Estimation of Caribbean Tourism Demand: Issues in Measurement and Methodology." *Atlantic Economic Journal,* 19(3): 32-40.

Chadeeand D. and Z. Mieczkowski (1987). "An Empirical Analysis of the Effects of the Exchange Rate on Canadian Tourism." *Journal of Travel Research,* 26(1): 13-17.

Chaiboonsri C., P. Chaitip, and N. Rangaswamy (2008). "A Panel Unit Root and Panel Cointegration Test of the Modeling International Tourism Demand in India." *Annals of the University of Petrosani Economics,* 8(1): 95-124.

Chaiboonsri C., P. Chaitip, and N. Rangaswamy (2009). "Modelling International Tourism Demand in Thailand." *Annals of the University of Petroşani Economics,* 9(3): 125-146.

Chaitip P. and C. Chaiboonsri (2009). "Thailand's International Tourism Demand: The ARDL Approach to Cointegration." *Annals of the University of Petroşani Economics, 9*(3): 163-184.

Chattopadhyay K. (1995). "International Tourism Demand for India." *Artha Vijñāna,* 37(2): 184-192.

Cheung C. and R. Law (2001). "Determinants of Tourism Hotel Expenditure in Hong Kong." *International Journal of Contemporary Hospitality Management*, 13(3):

151-158.

Cho V. (2001). “Tourism Forecasting and Its Relationship with Leading Economic Indicators.” *Journal of Hospitality and Tourism*, 25(4): 399-420.

Chon K., G. Li, S. Lin and Z. Gao (2010). “Recovery of Tourism Demand in Hong Kong from the Global Financial and Economic Crisis.” *Journal of China Tourism Research,* 6(3): 259-278.

Choy D.J.L. (1984). “Forecasting Tourism Revisited.” *Tourism Management,* 5(3): 171-176.

Choyakh H. (2008). “A Model of Tourism Demand for Tunisia: Inclusion of the Tourism Investment Variable.” *Tourism Economics*, 14(4): 819-838.

Cigliano J.M. (1980). “Price and Income Elasticities for Airline Travel: The North Atlantic Market.” *Business Economics,* 15: 17-21.

Cortés-Jiménez I., and A. Blake (2011). “Tourism Demand Modeling by Purpose of Visit and Nationality.” *Journal of Travel Research,* 50(4): 408-416.

Cortés-Jiménez I., R. Durbarry and M. Pulina (2009). “Estimation of Outbound Italian Tourism Demand: A Monthly Dynamic EC-LAIDS Model.” *Tourism Economics,* 15(3): 547-565.

Crampon L. J. and K. T. Tan (1973). “A Model of Tourism Flow into the Pacific.” *Tourism Review,* 28(3): 98-104.

Croes R.R. and M. Vanegas (2005). “An Econometric Study of Tourist Arrivals in Aruba and Its Implications.” *Tourism Management*, 26(6): 879-890.

Crouch G.I. (1992). “Effect of Income and Price on International Tourism.” *Annals of Tourism Research*, 19(4): 643-664.

Crouch G.I. (1994a). “The Study of International Tourism Demand: A Survey of Practice.” *Journal of Travel Research*, 32(4): 41-54.

Crouch G.I. (1994b). “Demand Elasticities for Short-Haul versus Long-Haul Tourism.” *Journal of Travel Research*, 33(2): 2-7.

Crouch G.I. (1995). “A Meta-analysis of Tourism Demand.” *Annals of Tourism Research*, 22(1): 103-118.

Crouch G.I. (1996). “Demand Elasticities in International Marketing: A Meta-Analytical Application to Tourism.” *Journal of Business Research*, 36(2): 117-136.

Crouch G.I., L. Schultz and P. Valerio (1992). “Marketing International Tourism to Australia: A Regression Analysis.” *Tourism Management*, 13(2): 196-208.

Daniel A.C.M. and F.F.R. Ramos (2002). “Modelling Inbound International Tourism Demand to Portugal.” *International Journal of Tourism Research*, 4(3): 193-209.

Day A.E. (1986). “Impact of Exchange Rates on Air Travel.” *International Journal of*

Hospitality Management, 5(3): 115-119.

De Mello M.M. and N. Fortuna (2005). "Testing Alternative Dynamic Systems for Modelling Tourism Demand." *Tourism Economics*, 11(4): 517-537.

De Mello M.M. and K.S. Nell (2005). "The Forecasting Ability of A Cointegrated VAR System of the UK Tourism Demand for France, Spain and Portugal." *Empirical Economics,* 30(2): 277-308.

Dhariwal R. (2005). "Tourist Arrivals in India: How Important are Domestic Disorders?" *Tourism Economics*, 11(2): 185-205.

Diamond J. (1977). "Tourism's Role in Economic Development: The Case Reexamined." *Economic Development and Cultural Change,* 25(3): 539-553.

Di Matteo L.and R. Di Matteo (1996). "An Analysis of Canadian Cross-border Travel." *Annals of Tourism Research,* 23(1): 103-122.

Divisekera S. (2009). "Ex-Post Demand for Australian Tourism Goods and Services." *Tourism Economics*, 15(1): 153-180.

Divisekera S. (2010). "Economics of Tourist's Consumption Behaviour: Some Evidence from Australia." *Tourism Management,* 31(5): 629-636.

Divisekera S. and N. Kulendran (2006). "Economic Effects of Advertising on Tourism Demand: A Case Study." *Tourism Economics*, 12(2): 187-205.

Dritsakis N. (2004). "Cointegration and Analysis of German and British Tourism Demand for Greece." *Tourism Management*, 25(1): 111-119.

Dritsakis N. and K. Gialetaki (2004a). "Cointegration Analysis of Tourism Revenues by the Member Countries of European Union to Greece." *Tourism Analysis,* 9(3): 179-186.

Dritsakis N. and K. Gialetaki (2004b). "Seasonal Tourism Demand Models from USA to Greece." *Tourism Recreation Research,* 29(3): 7-13.

Durbarry R. (2008). "Tourism Taxes: Implications for Tourism Demand in the UK." *Review of Development Economics*, 12(1): 21-36.

Durbarry R., J.F. Nicolas and B. Seetanah (2009). "The Determinants of Tourism Demand in South Africa Using A Dynamic Panel Data Approach." *Tourism Analysis*, 14(3): 375-385.

Durbarry R. and M.T. Sinclair (2003). "Market Shares Analysis: The Case of French Tourism Demand." *Annals of Tourism Research*, 30 (4): 927-941.

Duval D.T. and A. Schiff (2011). "Effect of Air Services Availability on International Visitors to New Zealand." *Journal of Air Transport Management,* 17(3): 175-180.

Dwyer L., P. Forsyth and P. Rao (2000). "The Price Competitiveness of Travel and Tourism: A Comparison of 19 Destinations." *Tourism Management*, 21(1): 9-22.

Edwards A. (1979). "International Tourism Development Forecasts to 1990." *Special*

Report No. 62. London: The Economist Intelligence Unit Limited.

Eita J. H., A. C. Jordaan and Y. Jordaan (2011). "An Econometric Analysis of the Determinants Impacting on Businesses in the Tourism Industry." *African Journal of Business Management,* 5(3): 666-675.

Eryiğit M., E. Kotil and R. Eryiğit (2010). "Factors Affecting International Tourism Flows to Turkey: A Gravity Model Approach." *Tourism Economics,* 16(3): 585-595.

Fernandes C. and A.V. Karnik (2010). "Estimating Elasticity of Demand for Tourism in Dubai." *Tourism Analysis,* 15(1): 57-69.

Fildes R., Y. Wei and S. Ismail (2011). "Evaluating the Forecasting Performance of Econometric Models of Air Passenger Traffic Flows Using Multiple Error Measures." *International Journal of Forecasting,* 27(3): 902-922.

Fourie J. and M. Santana-Gallego (2011). "The Impact of Mega-sport Events on Tourist Arrivals." *Tourism Management,* 32(6): 1364-1370.

García-Ferrer A. and R.A. Queralt (1997). "A Note on Forecasting International Tourism Demand in Spain." *International Journal of Forecasting*, 13(4): 539-549.

Garín-Muñoz T. (2004). "Madrid as A Tourist Destination: Analysis and Modelization of Inbound Tourism." *International Journal of Tourism Research*, 6(4): 289-302.

Garín Muñoz T. (2006). "Inbound International Tourism to Canary Islands: A Dynamic Panel Data Model." *Tourism Management*, 27(2): 281-291.

Garín-Muñoz T. (2007). "German Demand for Tourism in Spain." *Tourism Management*, 28 (1): 12-22

Garín-Muñoz T. (2009). "Tourism in Galicia: Domestic and Foreign Demand." *Tourism Economics*, 15(4): 753-769.

Garín-Muñoz T. and L.F. Montero-Martín (2007). "Tourism in the Balearic Islands: A Dynamic Model for International Demand Using Panel Data." *Tourism Management*, 28(5): 1224-1235.

Glass G.V., B. McGaw and S.M. Lee (1981). *Meta-Analysis in Social Research.* California: Sage Publication.

Gonzalez P. and P. Moral (1995). "An Analysis of the International Tourism Demand in Spain." *International Journal of Forecasting*, 11(2): 233-251.

Görmüs S. and I. Göçer (2010). "The Socio-economic Determinants of Tourism Demand in Turkey: A Panel Data Approach." *International Research Journal of Finance and Economics,* (55): 88-99.

Gray H.P. (1966). "The Demand for International Travel by the United States and Canada." *International Economic Review,* 7(1): 83-92.

Greenidge K. (2001). "Forecasting Tourism Demand: An STM Approach." *Annals of Tourism Research*, 28(1): 98-112.

Guizzardi A. and M. Mazzocchi (2010). "Tourism Demand for Italy and The Business Cycle." *Tourism Management,* 31(3): 367-377.

Gujarati D.N. (2003). *Basic Econometrics, 4th Edition*. Boston : McGraw Hill.

Gunadhi H. and C.K. Boey (1986). "Demand elasticities of tourism in Singapore." *Tourism Management*, 7(4): 239-253.

Guthrie H.W. (1961). "Demand for Tourists' Goods and Services in a World Market." *Papers and Proceedings of the Regional Science Association*, 7: 159-175.

Habibi F., K.A. Rahim, S. Ramchandran and L. Chin (2009). "Dynamic Model for International Tourism Demand for Malaysia: Panel Data Evidence." *International Research Journal of Finance and Economics,* 33: 207-217.

Haitovsky Y., I. Salomon, and L.A. Silman (1987). "The Economic Impact of Charter Flights on Tourism to Israel: An Econometric Approach." *Journal of Transport Economics and Policy,* 21(2): 111-134.

Halicioglu F. (2004). "An ARDL Model of Aggregate Tourism Demand for Turkey." *Global Business and Economics Review 2004 Anthology,* 614-624.

Halicioglu F. (2010). "An Econometric Analysis of the Aggregate Outbound Tourism Demand of Turkey." *Tourism Economics*, 16(1): 83-97.

Hamal K. (1998). "Australian Outbound Holiday Travel Demand: Long-haul Versus Short-haul." *BTR Conference Paper,* Gold Coast, Queensland, Australia.

Han Z., R. Durbarry and M.T. Sinclair (2006). "Modelling US Tourism Demand for European Destinations." *Tourism Management*, 27(1): 1-10.

Hanafiah M.H., M.F. Harun and M.R. Jamaluddin (2010). "Bilateral Trade and Tourism Demand." *World Applied Sciences Journal,* 10: 110-114.

Hanim N., R. Osman, A.H.A.M. Noor and M.S. Hasim (2010). "Malaysian Tourism Demand from the Middle East Market: A Preliminary Analysis." *Journal Antarabangsa Kajian Asia Barat,* 2(1): 37-52.

Hao J., T. Var and J. Chon (2003). "A Forecasting Model of Tourist Arrivals from Major Markets to Thailand." *Tourism Analysis,* 8(1): 33-45.

Hiemstra S.and K.K.F. Wong (2002). "Factors Affecting Demand for Tourism in Hong Kong." *Journal of Travel & Tourism Marketing,* 13(1-2): 41-60.

Ibrahim M.A. (2011). "The Determinants of International Tourism Demand for Egypt: Panel Data Evidence." *European Journal of Economics, Finance and Administrative Sciences,* (30): 51-58.

Idowu K.O. and A.K. Bello (2010). "What Are the Factors Determining Tourists Destinations in Africa?" *Pakistan Journal of Social Sciences,* 7(4): 301-303.

Jud G.D. and H. Joseph (1974). "International Demand for Latin American Tourism."

Growth and Change, 5(1): 25-31.

Keele L. and N.L. Kelly (2006). "Dynamic Models for Dynamic Theories: The Ins and Outs of Lagged Dependent Variables." *Political Analysis*, 14 (2): 186-205.

Ketenci N. (2009). "The ARDL Approach to Cointegration Analysis of Tourism Demand in Turkey with Greece as the Substitution Destination." *METU Studies in Development,* 36(2): 363-382.

Ketenci N. (2010). "Cointegration Analysis of Tourism Demand for Turkey." *Applied Econometrics and International Development, 10*(1): 91-112.

Khadaroo J. and B. Seetanah (2007). "Transport Infrastructure and Tourism Development." *Annals of Tourism Research,* 34(4): 1021-1032.

Khadaroo J. and B. Seetanah (2008). "The Role of Transport Infrastructure in International Tourism Development: A Gravity Model Approach." *Tourism Management*, 29(5): 831-840.

Kim H., K. Park and M. Sakai (2002). "Forecasting International Tourism Demand from Japan to Korea." *Journal of the Faculty of Agriculture, Kyushu University*, 47(1): 179-193.

Kim S. and H. Song (1998). "Analysis of Inbound Tourism Demand in South Korea: A Cointegration and Error Correction Approach." *Tourism Analysis*, 3(1): 25-41.

Kliman M.L. (1981). "A Quantitative Analysis of Canadian Overseas Tourism." *Transportation Research Part A: General,* 15(6): 487-497.

Kraipornsak P. (2011). "The World Economy, Competition, External Shocks and Demand for International Tourist Arrivals in Thailand." *International Journal of Trade and Global Markets,* 4(1): 93-108.

Kulendran N. (1996). "Modelling Quarterly Tourist Flows to Australia Using Cointegration Analysis." *Tourism Economics,* 2(3): 203-222.

Kulendran N. and S. Divisekera (2006). *Australian Tourism Marketing Expenditure Elasticity Estimates*. CRC for Sustainable Tourism: Gold Coast.

Kulendran N. and S. Divisekera (2007). "Measuring the Economic Impact of Australian Tourism Marketing Expenditure." *Tourism Economics,* 13(2): 261-274.

Kulendran N. and L. Dwyer (2009). "Measuring the Return from Australian Tourism Marketing Expenditure." *Journal of Travel Research,* 47(3): 275-284.

Kulendran N. and D. Sarath (2007). "Measuring the Economic Impact of Australian Tourism Marketing Expenditure." *Tourism Economics*, 13(2): 261-274.

Kulendran N. and K. Wilson (2000). "Modelling Business Travel." *Tourism Economics,* 6(1): 47-59.

Kwack S.Y. (1972). "Effects of Income and Prices on Travel Spending Abroad, 1960

III-1967 IV." *International Economic Review,* 13(2): 245-256.

Laber G. (1969). "Determinants of International Travel between Canada and the United States." *Geographical Analysis,* 1(4): 329-336.

Lathiras P. and C. Siriopoulos (1998). "The Demand for Tourism to Greece: A Cointegration Approach." *Tourism Economics,* 4(2): 171-185.

Law R. and N. Au (2000). "Relationship Modelling in Tourism Shopping: A Decision Rules Based Approach." *Journal of Travel & Tourism Marketing*, 21(3): 241-249.

Ledesma-Rodríguez F. J., M. Navarro-Ibáñez and J.V. Pérez-Rodríguez (2001). "Panel Data and Tourism: A Case Study of Tenerife." *Tourism Economics,* 7(1): 75-88.

Lehto X.Y., A.M. Morrison and J.T. O'Leary (2001). "Does the Visiting Friends and Relatives' Typology Make a Difference? A Story of the International VFR Market to the United States." *Journal of Travel Research*, 40(2): 201-212.

Leitão N.C. (2010). "Does Trade Help to Explain Tourism Demand? The Case of Portugal." *Theoretical and Applied Economics,* 17(3): 63-74.

Lelwala E. and L.H.P. Gunaratne (2009). "Modelling Tourism Demand Using Cointegration Analysis: A Case Study for Tourists Arriving from United Kingdom to Sri Lanka." *Tropical Agricultural Research,* 20: 50-59.

Li G., H. Song and S.F. Witt (2004). "Modelling Tourism Demand: A Dynamic Linear AIDS Approach." *Journal of Travel Research*, 43(2): 141-150.

Li G., H. Song and S.F. Witt (2005). "Recent Developments in Econometric Modeling and Forecasting." *Journal of Travel Research*, 44(1): 82-99.

Li G., K.K.F. Wong, H. Song and S.F. Witt (2006). "Tourism Demand Forecasting: A Time Varying Parameter Error Correction Model." *Journal of Travel Research,* 45(2): 175-185.

Lim C. (1997). "Review of International Tourism Demand Models." *Annals of Tourism Research,* 24(4):835-849.

Lim C. (1999). "A Meta-Analytic Review of International Tourism Demand." *Journal of Travel Research*, 37(3): 273-284.

Lim C. (2004). "The Major Determinants of Korean Outbound Travel to Australia." *Mathematics and Computers in Simulation*, 64(3-4): 477-485.

Lim C. and M. McAleer (2002). "A Cointegration Analysis of Annual Tourism Demand by Malaysia for Australia." *Mathematics and Computers in Simulation,* 59(1–3): 197-205.

Lim C., M. McAleer and J.C.H. Min (2009). "ARMAX Modelling of International Tourism Demand." *Mathematics and Computers in Simulation,* 79(9): 2879-2888.

Lim C., J.C.H. Min and M. McAleer (2008). "Modelling Income Effects on Long and Short Haul International Travel from Japan." *Tourism Management,* 29(6): 1099-1109.

Lise W. and R.S.J. Tol (2002). "Impact of Climate on Tourist Demand." *Climatic Change*, 55(4): 429-449.

Little J.S. (1980). "International Travel in the U.S. Balance of Payments." *New England Economic Review*, (May/June): 42-55.

Loeb P.D. (1982). "International Travel to the United States: An Econometric Evaluation." *Annals of Tourism Research,* 9(1): 7-20.

Lyssiotou P. (2000). "Dynamic Analysis of British Demand for Tourism Abroad." *Empirical Economics,* 25(3): 421-436.

Mangion M.L., R. Durbarry and M.T. Sinclair (2005). "Tourism Competitiveness: Price and Quality." *Tourism Economics*, 11(1): 45-68.

Marquardt D.W. (1970). "Generalized Inverses, Ridge Regression, Biased Linear Estimation, and Nonlinear Estimation." *Technometrics* , 12(3): 591-612.

Martin C.A. and S.F. Witt (1987). "Tourism Demand Forecasting Models: Choice of Appropriate Variable to Represent Tourists' Cost of Living." *Tourism Management,* 8(3): 233-246.

Martin C.A. and S.F. Witt (1988). "Substitute Prices in Models of Tourism Demand." *Annals of Tourism Research*, 15(2): 255-268.

Martin C.A. and S.F. Witt (1989). "Accuracy of Econometric Forecasts of Tourism." *Annals of Tourism Research*, 16 (3): 407-428.

Mason C.H. and W.D. Perreault, Jr. (1991). "Collinearity, Power, and Interpretation of Multiple Regression Analysis." *Journal of Marketing Research*, 28(3): 268-280.

McDermott P.J. and L.R. Jackson (1985). *The Economic Determinants of Tourist Arrivals in Australia and New Zealand*. New Zealand Tourist Industry Federation Inc: Wellington, New Zealand.

Mervar A. and J.E. Payne (2007). "Analysis of Foreign Tourism Demand for Croatian Destinations: Long-run Elasticity Estimates." *Tourism Economics*, 13(3): 407-420.

Morley C.L. (1997). "An Evaluation of the Use of Ordinary Least Squares for Estimating Tourism Demand Models." *Journal of Travel Research,* 35(4): 69-73.

Morley C.L. (1998). "A Dynamic International Demand Model." *Annals of Tourism Research*, 25(1): 70-84.

Morris A., K. Wilson and S. Bakalis (1995). "Modelling Tourism Flows from Europe to Australia." *Tourism Economics,* 1(2): 147-167.

Mutti J. and Y. Murai (1977). “Airline Travel on the North Atlantic: Is Profitability Possible?” *Journal of Transport Economics and Policy,* 11(1): 45-53.

Narayan P.K. (2002). “A Tourism Demand Model for Fiji, 1970-2000.” *Pacific Economic Bulletin,* 17(2): 103-116.

Narayan P.K. (2003). “Determinants of Tourist Expenditure in FIJI, A Cointegration Approach.” *Pacific Tourism Review,* 6(3-4): 159-167.

Narayan P.K. (2004). “Fiji’s Tourism Demand: The ARDL Approach to Cointegration.” *Tourism Economics*, 10(2): 193-206.

Naude W.A. and A. Saayman (2005). “Determinants of Tourist Arrivals in Africa: A Panel Data Regression Analysis.” *Tourism Economics*, 11(3): 365-391.

Njegovan N. (2005). “A Leading Indicator Approach to Predicting Short-term Shifts in Demand for Business Travel by Air To and From the UK.” *Journal of Forecasting,* 24(6): 421-432.

Njegovan N. (2006). “Elasticities of Demand for Leisure Air Travel: A System Modelling Approach.” *Journal of Air Transport Management,* 12(1): 33-39.

O'Hagan J.W. and M.J. Harrison (1984a). “UK and US Visitor Expenditure in Ireland: Some Econometric Findings.” *Economic and Social Review,* 15(3): 195-207.

O'Hagan J.W. and M.J. Harrison (1984b). “Market Shares of US Tourist Expenditure in Europe: An Econometric Analysis.” *Applied Economics*, 16(6): 919-931.

Oliver F.R. (1971). “The Effectiveness of the UK Travel Allowance.” *Applied Economics,* 3(3): 219-226.

Ordóñez J.M., M.D.C. Ordóñez and J.L. Torres (2010). “Distance Matters: An Assessment of International Tourism Demand in Spain.” *Tourism Analysis,* 15(2): 183-196.

Ouerfelli C. (2008). “Co-integration Analysis of Quarterly European Tourism Demand in Tunisia.” *Tourism Management,* 29(1): 127-137.

Ouerfelli C. (2010). “Analysis of European Tourism Demand for Tunisia: A New Approach.” *International Journal of Tourism Policy,* 3(3): 223-236.

Papadopoulos S.I. and S.F. Witt (1985). “A Marketing Analysis of Foreign Tourism in Greece.” *Proceedings of Second World Marketing Congress,* 682-693.

Papanikos G.T. and C. Sakellariou (1997). “An Econometric Application of the Almost Ideal Demand System Model to Japan's Tourist Demand for ASEAN Destinations.” *Journal of Applied Recreation Research,* 22(2): 157-172.

Payne J.E. and A. Mervar (2002). “A Note on Modelling Tourism Revenues in Croatia.” *Tourism Economics,* 8(1): 103-109.

Phakdisoth L. and D. Kim (2007). “The Determinants of Inbound Tourism in Laos.” *ASEAN Economic Bulletin,* 24: 225-237.

Phillips B. and K. Hamal (2000). “Modelling Australian Outbound Travel Demand.”

Australian Tourism and Hospitality Research Conference, Mt Buller, Australia

Qu H. and J. Zhang (1995). "Determinants of Tourist Arrivals and Expenditures in Canada." *Journal of Travel Research,* 34(2): 43-49.

Quayson J. and T. Var (1982). "A Tourism Demand Function for the Okanagan, BC." *Tourism Management,* 3(2): 108-115.

Rey B., R.L. Myro and A. Galera (2011). "Effect of Low-cost Airlines on Tourism in Spain. A Dynamic Panel Data Model." *Journal of Air Transport Management,* 17(3): 163-167.

Rosselló J., E. Aguiló and A. Riera (2005). "Modeling Tourism Demand Dynamics." *Journal of Travel Research,* 44(1): 111-116.

Rudez H.N. (2008). "The GDP Impact on International Tourism Demand: A Slovenia Based Case." *Tourism and Hospitality Management,* 14(2): 217-228.

Rugg D. (1973). "The Choice of Journey Destination: A Theoretical and Empirical Analysis." *The Review of Economics and Statistics,* 55(1): 64-72.

Saayman A. and M. Saayman (2008). "Determinants of Inbound Tourism to South Africa." *Tourism Economics,* 14(1): 81-96.

Sakai M.Y. (1988). "A Micro-Analysis of Business Travel Demand." *Applied Economics*, 20(11): 1481-1495.

Salleh N.H. (2007). "An ARDL Model of Tourism Demand for Malaysia. *IIUM." Journal of Economics and Management,* 15(1): 65-92.

Salleh N.H., R. Othman and S. Ramachandran (2007). "Malaysia's Tourism Demand from Selected Countries: The ARDL Approach to Cointegration." *International Journal of Economics and Management,* 1(3): 345-363.

Salleh N.H., L. Siong-Hook, S. Ramachandran, A. Shuib and N.Z. Mohd (2008). "Asian Tourism Demand for Malaysia: A Bound Test Approach." *Contemporary Management Research,* 4(4): 351-368.

Santana-Gallego M., F.J. Ledesma-Rodríguez and J.V. Pérez-Rodríguez (2010). "Exchange Rate Regimes and Tourism." *Tourism Economics,* 16(1): 25-43.

Santana-Jiménez Y. and J.M. Hernández (2011). "Estimating the Effect of Overcrowding on Tourist Attraction: The Case of Canary Islands." *Tourism Management,* 32(2): 415-425.

Sargan, J. D. (1964). "Wages and Prices in the United Kingdom: A Study in Econometrics Methodology." *Econometric Analysis for National Economic Planning,* 16: 25-54.

Schiff A. and S. Becken (2011). "Demand Elasticity Estimates for New Zealand Tourism." *Tourism Management,* 32(3): 564-575.

Seetanah B., R. Durbarry and J.F.N. Ragodoo (2010). "Using the Panel Cointegration Approach to Analyse the Determinants of Tourism Demand in South Africa."

Tourism Economics, 16(3): 715-729.

Seetaram N. (2010). "Use of Dynamic Panel Cointegration Approach to Model International Arrivals to Australia." *Journal of Travel Research,* 49(4): 414-422.

Seetaram N. and L. Dwyer (2009). "Immigration and Tourism Demand in Australia: A Panel Data Analysis." *Anatolia*, 20(1): 212-222.

Smeral E. (1988). "Tourism Demand, Economic Theory and Econometrics: An Integrated Approach." *Journal of Travel Research,* 36(4): 38-43.

Smeral E. (2009). "The Impact of the Financial and Economic Crisis on European Tourism." *Journal of Travel Research,* 48(1): 3-13.

Smeral E. (2010). "Impacts of the World Recession and Economic Crisis on Tourism: Forecasts and Potential Risks." *Journal of Travel Research*, 49(1): 31-38.

Smeral, E. (2012). "International Tourism Demand and the Business Cycle." *Annals of Tourism Research,* 39(1): 379-400.

Smeral E. and S.F. Witt (1996). "Econometric Forecasts of Tourism Demand to 2005." *Annals of Tourism Research*, 23(4): 891-907.

Song H., G. Li, S.F. Witt and G. Athanasopoulos (2011a). "Forecasting Tourist Arrivals Using Time-varying Parameter Structural Time Series Models." *International Journal of Forecasting,* 27(3): 855-869.

Song H. and S. Lin (2010). "Impacts of the Financial and Economic Crisis on Tourism in Asia." *Journal of Travel Research*, 49(1): 16-30.

Song H., S. Lin, S.F. Witt and X. Zhang (2011b). "Impact of Financial/Economic Crisis on Demand for Hotel Rooms in Hong Kong." *Tourism Management,* 32(1): 172-186.

Song H., P. Romilly and X. Liu (2000). "An Empirical Study of Outbound Tourism Demand in the UK." *Applied Economics*, 32(5): 611-624.

Song H. and S.F. Witt (2003). "Tourism Forecasting: The General-to-Specific Approach." *Journal of Travel Research*, 42(1): 65-74.

Song H., S.F. Witt and T.C. Jensen (2003). "Tourism Forecasting: Accuracy of Alternative Econometric Models." *International Journal of Forecasting*, 19(1): 123-141.

Song H., S.F. Witt and G. Li (2003). "Modelling and Forecasting the Demand for Thai Tourism." *Tourism Economics*, 9(4): 363-387.

Song H., S.F. Witt and G. Li (2009a). *The Advanced Econometrics of Tourism Demand*. Routledge: London.

Song H. and K.K.F. Wong (2003). "Tourism Demand Modelling: A Time-Varying Parameter Approach." *Journal of Travel Research*, 42(1): 57-64.

Song H., K.K.F. Wong and K.K.S. Chon (2003). "Modelling and Forecasting the

Demand for Hong Kong Tourism." *International Journal ofHospitality Management*, 22(4): 435-451.

Sriboonjit J., Y. Chaovanapoonphol, A. Wiboonpongse, P. Calkins and S. Sriboonchitta (2010). "Economic Determinants of Long-term Equilibrium in Malaysian Tourist Arrivals to Thailand, Implications for Tourism Policy." *International Journal of Intelligent Technologies and Applied Statistics,* 3(4): 421-435.

Straszheim M. R. (1978). "Airline Demand Functions in the North Atlantic and Their Pricing Implications." *Journal of Transport Economics and Policy,* 12(2): 179-195.

Stronge W. (1982). "The Overseas Demand for Tourism in the United States." *Review of Regional Studies,* 12(3): 40-53.

Stronge W. and M. Redman (1982). "U.S. Tourism in Mexico: An Empirical Analysis." *Annals of Tourism Research,* 9(1): 21-35.

Summary R. (1987). "Estimation of Tourism Demand by Multivariable Regression Analysis: Evidence from Kenya." *Tourism Management,*8(4): 317-322.

Surugiu C., N.C. Leitão and M.R. Surugiu (2011). A Panel Data Modelling of International Tourism Demand: Evidences for Romania. *Ekonomska Istraživanja,* 24(1): 134-145.

Tan A.Y.F., C. McCahon and J. Miller (2002a). "Modeling Tourist Flows to Indonesia and Malaysia." *Journal of Travel & Tourism Marketing,* 13(1-2): 61-82.

Tan A.Y.F., C. McCahon and J. Miller (2002b). "Stability of Inbound Tourism Demand Models for Indonesia and Malaysia: The Pre-and Post-formation of Tourism Development Organizations." *Journal of Hospitality & Tourism Research,* 26(4): 361-378.

Tan A.Y.F and K.K.F. Wong (2003). "Structural Change in Hong Kong's Inbound Tourism Demand Model: The Impact of the Asian Financial Crisis." *Tourism Review International,* 7(3-4): 123-128.

Tang S., E.A. Selvanathan and S. Selvanathan (2007). "The Relationship between Foreign Direct Investment and Tourism: Empirical Evidence from China." *Tourism Economics*, 13(1): 25-39.

Thompson A. (2011). "Terrorism and Tourism in Developed Versus Developing Countries." *Tourism Economics,* 17 (3): 693-700.

Thompson A. and H. Thompson (2010). "The Exchange Rate, Euro Switch and Tourism Revenue in Greece." *Tourism Economics,* 16(3): 773-780.

Toh R.S., H. Khan and L. Goh (2006). "Japanese Demand for Tourism in Singapore: A Cointegration Approach." *Tourism Analysis,* 10(4): 369-375.

Tremblay P. (1989). "Pooling International Tourism in Western Europe." *Annals of*

Tourism Research, 16(4): 477-491.

Truett D.B. and L.J. Truett (1987). "The Response of Tourism to International Economic Conditions: Greece, Mexico, and Spain." *Journal of Developing Areas*, 21(2): 177-190.

Turner L.W. and S.F. Witt (2001). "Factors Influencing Demand for International Tourism: Tourism Demand Analysis Using Structural Equation Modeling, Revisited." *Tourism Economics*, 7(1): 21-38.

Uner M.M., N. Kose and S. Gokten (2008). "An Econometric Model of Tourism Demand and Room Rates: A Study in Belek, Antalya." *Anatolia: An International Journal of Tourism and Hospitality Research*, 19(1): 41-50.

Uysal M. and J.L. Crompton (1984). "Determinants of Demand for International Tourist Flows to Turkey." *Tourism Management*, 5(4): 288-297.

Uysal M. and M.S. El Roubi (1999). "Artificial Neural Networks Versus Multiple Regression in Tourism Demand Analysis." *Journal of Travel Research,* 38(2): 111-118.

Vanegas M. (2009). "Tourism Demand Response by Residents of Latin American Countries." *International Journal of Tourism Research*, 11 (1): 17-19.

Vanegas M. (2010). "Box-cox Estimation of International Tourism Demand for Nicaragua." *Tourism Analysis,* 15(4): 447-459.

Vanegas M and R.R. Croes (2000). "Evaluation of Demand: US Tourists to Aruba." *Annals of Tourism Research,* 27(4): 946-963.

Var T., G. Mohammad and O. Icoz (1990). "Factors Affecting International Tourism Demand for Turkey." *Annals of Tourism Research,* 17(4): 606-610.

Veloce W. (2004). "Forecasting Inbound Canadian Tourism: An Evaluation of Error Corrections Model Forecasts." *Tourism Economics*, 10(3): 262-280.

Webber A.G. (2001). "Exchange Rate Volatility and Cointegration in Tourism Demand." *Journal of Travel Research*, 39(4): 398-405.

White K.J. (1985). "An International Travel Demand Model US Travel to Western Europe." *Annals of Tourism Research,* 12(4): 529-545.

White K.J. and M.B. Walker (1982). "Trouble in the Travel Account." *Annals of Tourism Research,* 9(1): 37-56.

Witt S.F. (1980a). "An Abstract Mode–Abstract (Destination) Node Model of Foreign Holiday Demand." *Applied Economics,* 12(2): 163-180.

Witt S.F. (1980b). "An Econometric Comparison of UK and German Foreign Holiday Behaviour." *Managerial and Decision Economics,* 1(3): 123-131.

Witt S.F. and C.A. Martin (1987a). "Econometric Models for Forecasting International Tourism Demand." *Journal of Travel Research*, 25(3): 23-30.

Witt S.F. and C.A. Witt (1995). "Forecasting Tourism Demand: A Review of

Empirical Research." *International Journal of Forecasting*, 11(3): 447-475.

Wu D.C., G. Li and H. Song (2011). "Analyzing Tourist Consumption: A Dynamic System-of-Equations Approach." *Journal of Travel Research,* 50(1): 46-56.

Yang C., H. Lin and C. Han (2010). "Analysis of International Tourist Arrivals in China: The Role of World Heritage Sites." *Tourism Management,* 31(6): 827-837.

Yoon J. and E.L. Shafer (1996). "Models of U.S. Travel Demand Patterns for the Bahamas." *Journal of Travel Research,* 35(1): 50-56.

Zhang H.Q., N. Kulendran and H. Song (2010). "Measuring Returns on Hong Kong's Tourism Marketing Expenditure." *Tourism Economics*, 16(4): 853-865.

Table 1 Articles Reporting Demand Elasticities of International Tourism

Author	Title	Year	Income Elasticity	Price Elasticity
Aguilo, Riera and Rossello	The Short-term Price Effect of A Tourist Tax Through A Dynamic Demand Model. The case of the Balearic Islands	2005	0	4
Akis	A Compact Econometric Model of Tourism Demand for Turkey	1998	18	15
Algieri	An Econometric Estimation of the Demand for Tourism: the Case of Russia	2006a	1	1
Algieri	International Tourism Specialisation of Small Countries	2006b	1	1
Algieri and Kanellopoulou	Determinants of Demand for Exports of Tourism: An Unobserved Component Model	2009	4	4
Anastasopoulos	The U.S. Travel Account: the Impact of Fluctuations of the U.S. Dollar	1989	20	6
Asgary et al.	The Determinants of Expenditures by Mexican Visitors to the Border Cities of Texas	1997	2	0
Bankole and Babatunde	Elasticities of Demand for Tourism in Nigeria: An Ardl Approach	2010	1	1
Barry and O'Hagan	An Econometric Study of British Tourist Expenditure in Ireland	1972	6	0
Blackwell	Tourist Traffic and the Demand for Accommodation: Some Projections	1970	4	0
Bond and Ladman	International Tourism and Economic Development: A Special case for Latin America	1972	3	0
Bonham,Gangnes and Zhou	Modeling Tourism: A Fully Identified VECM Approach	2009	1	0
Botti et al.	An Econometric Model of Tourism Demand in France	2007	5	5
Brakke	International Tourism, Demand, and GDP Implications: A Background and Empirical Analysis	2005	1	1
Brida and Risso	A Dynamic Panel Data Study of the German Demand for Tourism in South Tyrol	2009	1	1
Brida, Risso and Carrera	A Long-run Equilibrium Demand Function: Tourism in Mexico	2008	1	0
Campbell and Mitchell	Determinants of Outbound Holiday Travel for Barbados	2007	2	2
Carey	Estimation of Caribbean Tourism Demand: Issues in Measurement and Methodology	1991	2	0
Carey	Tourism Development in LDCs: Hotel Capacity Expansion with Reference to Barbados	1989	1	2
Chadee and Mieczkowski	An Empirical Analysis of the Effects of the Exchange Rate on Canadian Tourism	1987	1	1
Chaitip and Chaiboonsri	Thailand's International Tourism Demand: The ARDL Approach to Cointegration	2009	23	10
Chaiboonsri, Chaitip and Rangaswamy	A Panel Unit Root and Panel Cointegration Test of The Modeling International Tourism Demand in India	2008	19	18
Chaiboonsri, Chaitip and Rangaswamy	Modelling International Tourism Demand in Thailand	2009	12	2
Chattopadhyay	International Tourism Demand for India	1995	23	0
Chon et al.	Recovery of Tourism Demand in Hong Kong From the Global Financial and Economic Crisis	2010	9	7
Choyakh	A Model of Tourism Demand for Tunisia: Inclusion of the Tourism Investment Variable	2008	12	10
Cigliano	Price and Income Elasticities for Airline Travel: the North Atlantic Market	1980	5	6
Cortés-Jiménez and Blake	Tourism Demand Modeling by Purpose of Visit and Nationality	2011	33	25
Cortés-Jiménez, Durbarry and Pulina	Estimation of Outbound Italian Tourism Demand: A Monthly Dynamic EC-LAIDS Model	2009	4	4
Crampton and Tan	A Model of Tourism Flow into the Pacific	1973	2	0
Croes and Vanegas	An Econometric Study of Tourist Arrivals in Aruba and Its Implications	2005	6	3
Crouch,Schultzb and Valerio	Marketing international tourism to Australia: A regression analysis	1992	18	11
Daniel and Ramos	Modelling Inbound International Tourism Demand to Portugal	2002	6	6
Day	Impact of Exchange Rates on Air Travel	1986	4	19

De Mello and Fortuna	Testing Alternative Dynamic Systems for Modelling Tourism Demand	2005	9	9
De Mello and Nell	The Forecasting Ability of A Cointegrated VAR System of the UK Tourism Demand for France, Spain and Portugal	2005	3	3
Di Matteo and Di Matteo	An Analysis of Canadian Cross-border Travel	1996	12	0
Diamond	Tourism's Role in Economic Development: The Case Reexamined	1977	10	0
Divisekera	Economics of Tourist's Consumption Behaviour: Some Evidence From Australia	2010	25	25
Divisekera	Ex Post Demand for Australian Tourism Goods and Services	2009	50	55
Divisekera and Kulendran	Economic Effects of Advertising on Tourism Demand: A Case Study	2006	8	8
Dritsakis	Cointegration Analysis of German and British Tourism Demand for Greece	2004	2	2
Dritsakis and Gialetaki	Cointegration analysis of tourism revenues by the member countries of European Union to Greece	2004	3	0
Dritsakis and Gialetaki	Seasonal Tourism Demand Models from USA to Greece	2004	2	2
Durbarry	Tourism Taxes: Implications for Tourism Demand in the UK	2008	6	6
Durbarry and Sinclair	Market Shares Analysis: The Case of French Tourism Demand	2003	3	3
Durbarry，Nicolas and Seetanah	The Determinants of Tourism Demand in South Africa Using A Dynamic Panel Data Approach	2009	8	8
Duval and Schiff	Effect of Air Services Availability on International Visitors to New Zealand	2011	10	6
Eita,Jordaan and Jordaan	An Econometric Analysis of the Determinants Impacting on Businesses in the Tourism Industry	2011	3	3
Eryigit,Kotil and Eryigit	Factors Affecting International Tourism Flows to Turkey: A Gravity Model Approach	2010	6	1
Fernandes and Karnik	Estimating Elasticity of Demand for Tourism in Dubai	2010	4	0
Fildesa, Weib and Ismailc	Evaluating the Forecasting Performance of Econometric Models of Air Passenger Traffic Flows Using Multiple Error Measures	2011	3	6
Fourie and Santana-Gallego	The Impact of Mega-sport Events on Tourist Arrivals	2011	6	6
García-Ferrer and Queralt	A Note on Forecasting International Tourism Demand in Spain	1997	1	0
Garın-Munoz	Inbound International Tourism to Canary Islands: A Dynamic Panel Data Model	2006	4	4
Garín-Muñoz	Madrid as a Tourist Destination: Analysis and Modelization of Inbound Tourism	2004	5	5
Garín-Muñoz	German Demand for Tourism in Spain	2007	2	2
Garín-Muñoz	Tourism in Galicia: Domestic and Foreign Demand	2009	3	0
Garín-Muñoz and Montero-Martın	Tourism in the Balearic Islands: A Dynamic Model for International Demand Using Panel Data	2007	1	1
Gonzailez and Moral	An Analysis of the International Tourism Demand in Spain	1995	1	2
Görmüs and Göçer	The Socio-Economic Determinant of Tourism Demand in Turkey: A Panel Data Approach	2010	11	0
Gray	The Demand for International Travel by the United States and Canada	1966	12	0
Greenidge	Forecasting Tourism Demand: An STM Approach	2001	4	2
Guizzardi and Mazzocchi	Tourism Demand for Italy and The Business Cycle	2010	1	1
Gunadhi and Chow	Demand Elasticities of Tourism in Singapore	1986	6	0
Guthrie	Demand for Tourists' Goods and Servieces in a World Market	1961	1	0
Habibi, Rahim and Ramchandran	Dynamic Model for International Tourism Demand for Malaysia: Panel Data Evidence	2009	1	1
Haitovsky,Salomon and Silman	The Economic Impact of Charter Flights on Tourism to Israel: An Econometric Approach	1987	0	3
Halicioglu	An ARDL Model of Aggregate Tourism Demand for Turkey	2004	4	4
Halicioglu	An Econometric Analysis of The Aggregate Outbound Tourism Demand of Turkey	2010	4	4
Hamal	Australian Outbound Holiday Travel Demand: Long-haul Versus Short-haul	1998	5	6
Han, Durbarry and Sinclair	Modelling US Tourism Demand for European Destinations	2006	4	4
Hanafiah, Harun and	Bilateral Trade and Tourism Demand	2010	1	1

Jamaluddin				
Hanim et al.	Malaysian Tourism Demand From the Middle East Market: a Preliminary Analysis	2010	3	0
Hao,Var and Chon	A Forecasting Model of Tourist Arrivals From Major Markets to Thailand	2003	5	3
Hiemstra and Wong	Factors Affecting Demand for Tourism in Hong Kong	2002	4	4
Ibrahim	The Determinants of International Tourism Demand for Egypt: Panel Data Evidence	2011	1	1
Idowu and Bello	What Are the Factors Determining Tourists Destinations in Africa?	2010	2	2
Jud and Joseph	International Demand for Latin American Tourism	1974	16	9
Ketenci	Cointegration Analysis of Tourism Demand for Turkey	2010	119	74
Ketenci	The ARDL Approach to Cointegration Analysis of Tourism Demand in Turkey with Greece As The Substitution Destination	2009	12	13
Khadaroo and Seetanah	The Role of Transport Infrastructure in International Tourism Development: A Gravity Model Approach	2008	9	9
Khadaroo and Seetanah	Transport Infrastructure and Tourism Development	2007	8	8
Kim and Song	Analysis of Inbound Tourism Demand in South Korea: A Cointegration and Error Correction Approach	1998	7	4
Kim, Park and Sakai	Forecasting International Tourism Demand from Japan to Korea	2002	6	6
Kliman	A Quantitative Analysis of Canadian Overseas Tourism	1981	10	12
Kraipornsak	The World Economy, Competition, External Shocks and Demand for International Tourist Arrivals in Thailand	2011	10	3
Kulendran	Modelling Quarterly Tourist Flows to Australia Using Cointegration Analysis	1996	4	6
Kulendran and Divisekera	Australian Tourism Marketing Expenditure Elasticity Estimates	2006	8	8
Kulendran and Divisekera	Measuring the Economic Impact of Australian Tourism Marketing Expenditure	2007	8	9
Kulendran and Dwyer	Measuring the Return from Australian Tourism Marketing Expenditure	2009	4	3
Kulendran and Wilson	Modelling Business Travel	2000	4	1
Kulendran and Witt	Cointegration Versus Least Squares Regression	2001	11	6
Kulendran and Witt	Forecasting the Demand for International Business Tourism	2003	1	1
Kwack	Effects of Income and Prices on Travel Spending Abroad, 1960 III-1967 IV	1972	7	3
Laber	Determinants of International Travel between Canada and the United States	1969	4	0
Lathiras and Siriopoulos	The Demand for Tourism to Greece: A Cointegration Approach	1998	11	8
Ledesma-Rodriguez, Navarro-Ibanez and Perez-Rodriguez	Panel Data and Tourism: A Case Study of Tenerife	2001	8	8
Leitao	Does Trade Help to Explain Tourism Demand? The Case of Portugal	2010	3	3
Lelwala and Guanratne	Modelling Tourism Demand Using Cointegration Analysis: A Case Study for Tourists Arriving from United Kingdom to Sri Lanka	2009	1	2
Li et al.	Tourism Demand Forecasting: A Time Varying Parameter Error Correction Model	2006	14	15
Li, Song and Witt	Modeling Tourism Demand: A Dynamic Linear AIDS Approach	2004	10	10
Lim	The Major Determinants of Korean Outbound Travel to Australia	2004	2	2
Lim and McAleer	A Cointegration Analysis of Annual Tourism Demand by Malaysia for Australia	2002	12	6
Lim, McAleer and Min	ARMAX Modelling of International Tourism Demand	2009	4	0
Lim, Min and McAleer	Modelling Income Effects on Long and Short Haul International Travel from Japan	2008	38	0
Little	International Travel in the U.S.: Balance of Payments	1980	10	11
Loeb	International Travel to The United States An Econometric Evaluation	1982	14	7
Lyssiotou	Dynamic Analysis of British Demand for Tourism Abroad	2000	4	4
Mangion,Durbarry and Sinclair	Tourism Competitiveness: Price and Quality	2005	2	3
Martin and Witt	Accuracy of Econometric Forecasts of Tourism	1989	6	5
Martin and Witt	Substitute Prices in Models of Tourism Demand	1988	36	26

Martin and Witt	Tourism Demand Forecasting Models:Choice of Appropriate Variable to Represent Tourists' Cost of Living	1987	21	8
McDermott and Jackson	The Economic Determinants of Tourist Arrivals in Australia and New Zealand	1985	18	7
Mervar and Payne	Analysis of Foreign Tourism Demand for Croatian Destinations: Long-run Elasticity Estimates	2007	12	0
Morley	A Dynamic International Demand Model	1998	10	11
Morley	An Evaluation of the Use of Ordinary Least Squares for Estimating Tourism Demand Models	1997	12	11
Morris, Wilson and Bakalis	Modelling Tourism Flows from Europe to Australia	1995	7	5
Mutti and Murai	Airline Travel on the North Atlantic: Is Profitability Possible?	1977	11	11
Narayan	A Tourism Demand Model for Fiji, 1970-2000	2002	3	3
Narayan	Determinants of Tourist Expenditure in FIJI, A Cointegration Approach	2003	3	3
Njegovan	A Leading Indicator Approach to Predicting Short-Term Shifts in Demand for Business Travel by Air To and From the UK	2005	0	2
Njegovan	Elasticities of Demand for Leisure Air Travel: A System Modelling Approach	2006	2	2
O'Hagan and Harrison	U.K. and U.S. Visitor Expenditure in Ireland: Some Econometric Findings	1984a	2	2
O'Hagan and Harrison	Market Shares of U.S. Tourist Expenditure in Europe, An Econometric Analysis	1984b	15	14
Oliver	The Effectiveness of the UK Travel Allowance	1971	2	0
Ordóñez, Ordóñez and Torres	Distance Matters: An Assessment of International Tourism Demand in Spain	2010	6	6
Ouerfelli	Analysis of European Tourism Demand for Tunisia: A New Approach	2010	1	1
Ouerfelli	Co-integration Analysis of Quarterly European Tourism Demand in Tunisia	2008	6	6
Papadopoulos and Witt	A Marketing Analysis of Foreign Tourism in Greece	1985	24	15
Papanikos and Sakellariou	An Econometric Application of the Almost Ideal Demand System Model to Japan's Tourist Demand for ASEAN Destinations	1997	5	5
Payne and Mervar	A Note on Modelling Tourism Revenues in Croatia	2002	1	0
Phakdisoth and Kim	The Determinants of Inbound Tourism in Laos	2007	9	9
Phillips and Hamal	Modelling Australian Outbound Travel Demand	2000	14	9
Qu and Zhang	Determinants of Tourist Arrivals and Expenditures in Canada	1995	12	7
Quayson and Var	A Tourism Demand Function for the Okanagan, BC	1982	3	3
Rey,Myro and Galera	Effect of Low-cost Airlines on Tourism in Spain. A Dynamic Panel Data Model	2011	6	1
Rosselló, Aguiló and Riera	Modeling Tourism Demand Dynamics	2005	4	2
Rudez	The GDP Impact on International Tourism Demand: A Slovenia Based Case	2008	1	0
Rugg	The Choice of Journey Destination: A Theoretical and Empirical Analysis	1973	13	0
Saayman and Saayman	Determinants of Inbound Tourism to South Africa	2008	3	1
Salleh	An ARDL Model of Tourism Demand for Malaysia	2007	4	5
Salleh et al.	Asian Tourism Demand For Malaysia: A Bound Test Approach	2008	4	5
Salleh, Othman and Ramachandran	Malaysia's Tourism Demand from Selected Countries: The ARDL Approach to Cointegration	2007	3	4
Santana-Gallego, Ledesma-Rodriguez and Perez-Rodriguez	Exchange Rate Regimes and Tourism	2010	6	0
Santana-Jiménez and Hernández	Estimating the Effect of Overcrowding on Tourist Attraction: The Case of Canary Islands	2011	13	0
Schiff and Becken	Demand Elasticity Estimates for New Zealand Tourism	2011	13	15
Seetanah,Durbarry and Ragodoo	Using The Panel Cointegration Approach to Analyse The Determinants of Tourism Demand in South Africa	2010	5	5
Seetaram	Use of Dynamic Panel Cointegration Approach to Model International	2010	7	7

	Arrivals to Australia			
Seetaram and Dwyer	Immigration and Tourism Demand in Australia: A Panel Data Analysis	2009	1	1
Smeral	Impacts of the World Recession and Economic Crisis on Tourism: Forecasts and Potential Risks	2010	6	6
Smeral	International Tourism Demand and The Business Cycle	2012	5	5
Smeral	The Impact of the Financial and Economic Crisis on European Tourism	2009	2	2
Smeral	Tourism Demand, Economic Theory And Econometrics: An Integrated Approach	1988	16	16
Song and Witt	Tourism Forecasting: The General-to-Specific Approach	2003	15	16
Song and Wong	Tourism Demand Modeling: A Time-Varying Parameter Approach	2003	6	6
Song et al.	Forecasting Tourist Arrivals Using Time-varying Parameter Structural Time Series Models	2011a	4	4
Song et al.	Impact of Financial/Economic Crisis on Demand for Hotel Rooms in Hong Kong	2011b	36	35
Song et al.	Tourism Demand Modelling and Forecasting: How Should Demand Be Measured?	2010	8	7
Song, Witt and Li	Modelling and Forecasting the Demand for Thai Tourism	2003	21	28
Song, Romilly and Liu	An Empirical Study of Outbound Tourism Demand in the UK	2000	24	24
Song, Witt and Jensen	Tourism Forecasting: Accuracy of Alternative Econometric Models	2003	12	11
Song, Wong and Chon	Modelling and Forecasting the Demand for Hong Kong Tourism	2003	14	13
Sriboonjit et al.	Economic Determinants of Long-Term Equilibrium in Malaysian Tourist Arrivals to Thailand, Implications for Tourism Policy	2010	4	2
Straszheim	Airline Demand Functions in the North Atlantic and Their Pricing Implications	1978	2	7
Stronge	The Overseas Demand for Tourism in the United States	1982	8	7
Stronge and Redman	U.S. Tourism in Mexico: An Empirical Analysis	1982	1	0
Summary	Estimation of Tourism Demand by Multivariable Regression Analysis：Evidence from Kenya	1987	6	4
Surugiu, Leitão and Surugiu	A Panel Data Modelling of International Tourism Demand: Evidences for Romania	2011	2	1
Tan and Wong	Structural Change in Hong Kong's Inbound Tourism Demand Model: The Impact of The Asian Financial Crisis	2003	4	4
Tan, McCahon and Miller	Stability of Inbound Tourism Demand Models for Indonesia and Malaysia: The Pre-and Postformation of Tourism Development Organizations	2002b	6	2
Tan, McCahon and Miller	Modeling Tourist Flows to Indonesia and Malaysia	2002a	4	7
Thompson	Terrorism and Tourism in Developed Versus Developing Countries	2011	1	1
Thompson and Thompson	The Exchange Rate, Euro Switch and Tourism Revenue in Greece	2010	1	0
Toh,Khan and Goh	Japanese Demand for Tourism in Singapore:A Cointegration Approach	2006	1	1
Tremblay	Pooling International Tourism in Western Europe	1989	15	12
Truett and Truett	The Response of Tourism to International Economic Conditions: Greece, Mexico, and Spain	1987	9	9
Uner, Kose and Gokten	An Econometric Model of Tourism Demand and Room Rates: A Study in Belek, Antalya	2008	0	1
Uysal and Crompton	Determinants of Demand for International Tourist Flows to Turkey	1984	16	7
Uysal and El Roubi	Artificial Neural Networks versus Multiple Regression in Tourism Demand Analysis	1999	1	1
Vanegas	Box-cox Estimation of International Tourism Demand for Nicaragua	2010	29	30
Vanegas	Tourism Demand Response by Residents of Latin American Countries	2009	8	8
Vanegas and Croes	Evaluation of Demand, US Tourists to Aruba	2000	5	4
Var,Mohammad and Icoz	Factors Affecting International Tourism Demand for Turkey	1990	14	0
Veloce	Forecasting Inbound Canadian Tourism: An Evaluation of Error Corrections Model Forecasts	2004	4	0
Webber	Exchange Rate Volatility and Cointegration in Tourism Demand	2001	10	10
White	An International Travel Demand Model US Travel to Western Europe	1985	7	7
White and Walker	Trouble in The Travel Account	1982	4	4
Witt	An Abstract Mode–Abstract (Destination) Node Model of Foreign Holiday Demand	1980a	3	3

Witt	An Econometric Comparison of UK and German Foreign Holiday Behaviour	1980b	6	5
Witt and Martin	Econometric Models for Forecasting International Tourism Demand	1987a	40	37
Wu, Li and Song	Analyzing Tourist Consumption: A Dynamic System-of-Equations Approach	2011	24	20
Yang, Lin and Han	Analysis of International Tourist Arrivals in China: The Role of World Heritage Sites	2010	10	0
Yoon and Shafer	Models of U.S. Travel Demand Patterns for the Bahamas	1996	0	1
Zhang, Kulendran and Song	Measuring Returns on Hong Kong's Tourism Marketing Expenditure	2010	4	1
Total			**1633**	**1200**

Table 2

Income Elasticity of International Tourism Demand

Data Category	Subgroup	No.	%
Origin	Africa	12	0.7
	America	306	18.7
	Asia	270	16.5
	Oceania	113	6.9
	Europe	695	42.6
	Not Specified	237	14.6
Destination	Africa	57	3.5
	America	205	12.6
	Asia	593	36.3
	Oceania	238	14.6
	Europe	472	28.9
	Overseas	68	4.1
Model	Advanced	52	3.2
	Dynamic	737	45.1
	Static	844	51.7
Data Frequency	Monthly	154	9.4
	Quarterly	356	21.8
	Yearly	1123	68.8
Product	Accommodation	75	4.6
	Holiday	98	6.0
	Transportation	83	5.1
	VFR	52	3.2
	Business	17	1.0
	Destination	1242	76.1
	Others	66	4.0
Demand Measure	Arrival	1060	64.9
	Arrival/POP	179	11.0
	Expenditure	349	21.4
	Expenditure/POP	45	2.7
Travel Distance	Inter-continental	739	45.3
	Intra-continental	606	37.1
	others	288	17.6
Total		1633	

Table 3

Price Elasticity of International Tourism Demand

Data Category	Subgroup	No.	%
Origin	Africa	11	0.9
	America	241	20.0
	Asia	207	17.2
	Oceania	84	7.0
	Europe	495	41.1
	Not Specified	165	13.8
Destination	Africa	52	4.3
	America	144	12.0
	Asia	373	31.0
	Oceania	210	17.5
	Europe	368	30.6
	Overseas	56	4.6
Model	Advanced	15	1.2
	Dynamic	630	52.4
	Static	558	46.4
Data Frequency	Monthly	99	8.2
	Quarterly	258	21.4
	Yearly	846	70.4
Product	Accommodation	92	7.6
	Holiday	105	8.7
	Transportation	108	9.0
	VFR	33	2.7
	Business	9	0.7
	Destination	808	67.3
	Others	48	4.0
Demand Measure	Arrival	806	67.1
	Arrival/POP	122	10.1
	Expenditure	230	19.1
	Expenditure/POP	45	3.7
Travel Distance	Inter-continental	544	45.2
	Intra-continental	455	37.8
	Others	204	17.0
Total		1203	

Table 4 Meta-regression for tourism demand elasticity

	log(Income Elasticity)	t-value	Prob.	log(-Price Elasticity)	t-value	Prob.
constant	69.211	6.916	0.00	-0.550	-5.540	0.00
Origin Region						
Asia				0.152	1.727	0.08
America				0.141	1.795	0.07
Europe	0.321	5.922	0.00			
Oceania						
Africa						
Other region	benchmark			benchmark		
Destination Region						
Asia	-0.198	-2.722	0.00	0.346	3.953	0.00
America				0.312	2.952	0.00
Europe				0.375	4.522	0.00
Oceania	-0.164	-1.807				
Africa	-0.454	-3.139	0.00			
Other region	benchmark			benchmark		
Time Period						
1960s and before	benchmark			benchmark		
1970s	-0.189	-2.511	0.00			
1980s	0.295	4.080	0.00	0.119	1.782	0.08
1990s	0.444	4.747	0.00			
2000s	0.330	3.438	0.00			
Model						
Advanced Time-series						
Dynamic Econometrics	0.132	2.105	0.00			
Static Econometrics	benchmark			benchmark		
Data Frequency						
monthly	0.978	9.134	0.00			
quarterly						
annual	benchmark			benchmark		
Omission of Variable						
all five of these variables included	benchmark			benchmark		
income				0.257	1.965	0.05
own price						
substitute price	-0.328	-5.467	0.00	-0.133	-1.739	0.08
exchange rate	0.248	4.059	0.00			
travel cost				-0.228	-3.242	0.00
Travel Distance						
inter-continental	0.230	3.803	0.00			
intra-continental or not specified	benchmark			benchmark		
Demand and Variable Measure						
demand measured by expenditure	-0.182	-2.938	0.00	0.451	6.022	0.00
demand measured by others	benchmark			benchmark		
tourism demand at product level				-0.257	-3.589	0.00
tourism demand at destination level	benchmark			benchmark		
income measured in per capita form						
income measured in aggregate form	benchmark			benchmark		

Other Factors						
short-run estimate	-0.321	-3.416	0.00	-0.47	-4.9	0.00
long-run estimate	benchmark			benchmark		
sample size	-1.29E-05	-2.659	0.00	-3.03E-05	-5.951	0.00
No. of Variables	-0.02	-2.292				
lag length of dependent variable				0.12	4.068	0.00
publication year	-0.035	-6.879	0.00			
Adjusted R^2	**0.230**		**0.00**	**0.147**		0.00

Table 5

Average Income Elasticity of International Tourism Demand

Data Category	Subgroup	Mean	S.D.
Origin	Africa	1.147	1.712
	America	1.995	1.704
	Asia	1.716	2.243
	-Oceania	2.141	1.598
	Europe	3.419	3.977
	Not specified	1.771	1.853
Destination	Africa	2.169	1.973
	America	2.266	1.661
	Asia	3.165	4.252
	-Oceania	2.067	2.384
	Europe	2.225	1.958
	Not specified	1.734	2.118
Years of study	1960s and before	2.558	1.759
	1970s	2.199	2.014
	1980s	2.303	2.238
	1990s	2.614	3.365
	2000s	2.634	3.521
Model	Advanced Time-series	1.941	0.996
	Dynamic Econometrics	3.093	3.911
	Static Econometrics	2.067	2.065
Data Frequency	Monthly	6.454	6.176
	Quarterly	1.923	2.195
	Yearly	2.179	2.142
Product	Accommodation	1.166	0.535
	Holiday	2.401	2.742
	Transportation	2.475	1.979
	VFR	2.192	1.688
	Business	1.605	0.595
	Destination	2.729	3.328
	Others	1.007	0.214
Demand Measure	Arrival	2.724	3.484
	Arrival/POP	3.16	2.705
	Expenditure	1.691	1.467
	Expenditure /POP	1.822	1.034
Travel	Inter-continental	3.188	3.940

Table 6

Average Price Elasticity of International Tourism Demand

Data Category	Subgroup	Mean	S.D.
Origin	Africa	-0.783	0.743
	America	-1.277	1.888
	Asia	-1.420	2.453
	-Oceania	-1.112	1.104
	Europe	-1.265	1.421
	Not specified	-1.279	2.158
Destination	Africa	-1.166	1.782
	America	-1.545	2.874
	Asia	-1.456	1.679
	-Oceania	-0.844	1.919
	Europe	-1.291	1.315
	Not specified	-1.107	1.425
Years of study	1960s and before	-1.640	0.715
	1970s	-1.326	1.469
	1980s	-1.323	1.848
	1990s	-1.242	1.826
	2000s	-1.184	1.445
Model	Advanced Time-series	-1.605	2.472
	Dynamic Econometrics	-1.415	2.050
	Static Econometrics	-1.121	1.477
Data Frequency	Monthly	-1.683	1.938
	Quarterly	-1.134	2.449
	Yearly	-1.279	1.554
Product	Accommodation	-0.727	0.464
	Holiday	-1.102	1.383
	Transportation	-0.920	0.824
	VFR	-0.800	0.767
	Business	-0.350	0.184
	Destination	-1.489	2.092
	Others	-0.546	0.437
Demand Measure	Arrival	-1.240	1.679
	Arrival/POP	-0.749	0.643
	Expenditure	-1.704	2.580
	Expenditure /POP	-1.287	1.096
Travel	Inter-continental	-1.201	1.711

Distance			
	Intra-continental	2.053	1.901
	Others	1.827	1.952
Total		2.526	3.065

Distance			
	Intra-continental	-1.381	1.826
	Others	-1.269	2.060
Total		-1.281	1.818

Table 7 Average Income Elasticity of International Tourism Demand

origins / *destinations*	Africa	America	Asia	Oceania	Europe
Africa	0.516	5.835	1.604		3.253
America		2.060	2.145	2.560	2.107
Asia	1.937	2.598	1.464	2.249	5.269
Oceania		1.552	2.118	1.814	2.669
Europe		1.806		1.266	2.404

Table 8 Average Price Elasticity of International Tourism Demand

origins / *destinations*	Africa	America	Asia	Oceania	Europe
Africa	-0.282	-3.081	-0.579		-2.190
America	-0.704	-1.619	-1.310	-0.804	-1.136
Asia	-1.767	-1.223	-1.818	-1.246	-1.436
Oceania		-0.675	-1.046	-0.917	-0.449
Europe		-1.374		-0.750	-1.205