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Nexus Between Religious Journeys And Economic Influences – The case of Saudi Arabia

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This research investigates the role of economic factors in affecting faith-based travelling to Saudi Arabia and suggests GDP per capita income, relative price, population size, trade volume and cost of travelling as major determinants of religious tourism to the country of destination. This study is an important contribution to the literature on religious tourism as it provides empirical linkages between spiritual decisions and economic influences. In addition, this study adds new propositions to theory and identifies religious tourism as a 'Veblen good'. This research uses monthly data covering the time period 2004 M1 - 2015 M12. It employs an ARDL bound testing approach as well as a conditional error correction model to determine the demand function and quantifies the magnitude of long-run relationship between the variables and finally constructs bootstrap confidence intervals to determine their statistical significance.

Key Words: religious tourism, cost of travelling, Veblen good, ARDL bound testing

Introduction

As one of the earliest forms of tourism, the concept of religious tourism is associated with spiritual obligations and traditions (Rinschede, 1992). Since the beginning of human civilisation, people have travelled to holy sites and, over time, religious tourism has evolved into a large and segmented market. Currently, religious pilgrimage contains different sub-niches, which range from institutional travel (an organised form of tourism) to individual specific, and from luxury pilgrimage to backpacking. Since pilgrims tend to save their resources for travel as their religious obligation, earlier literature therefore considers faith-based tourism to be less sensitive to economic fluctuations (Crain, 1996). However, this current research aims to provide empirical linkages between spiritually-based travelling decisions and economic factors. To our knowledge this is the first study of religious tourism which links economic influences to religious travelling decisions through an Autoregressive Distributed Lag (ARDL) model.

Religion and economics are closely related because both involve human perceptions and there is a wealth of empirical literature examining the linkages between religious tourism and its impact on economic activities. These empirical studies consider various dimensions. Some studies evaluate the contribution of religious tourism to economic development, such as. Durlauf *et al.* (2012), Barro and McCleary (2003) and Glahe and Vorhies (1989); the returns on human capital and

religion (Tomes, 1984); religion and financial market performance (Peifer, 2011); the relationship between religion and decisions to allocate foreign direct investment (Hergueux, 2011); and globalisation with a focus on the international system (Thomson, 2007). Furthermore, there are several studies assessing the empirical linkages between religion and trade flows, and these studies include Lewer and van den Berg (2007), Helble (2007), Guo (2004), Mehanna (2003) and Ensminger (1997). Using artificial neural network (ANN), Asadi *et al.*, (2016) forecast the demand for religious tourism in Mashhad while considering economic factors. In addition, Ladki and Mazeh (2017) examine the pricing for *Hajj* among three groups of countries and find higher prices of *Hajj* for wealthy economies than for middle-income economies. The most populated economies generate more *Hajj* revenues. However, the current research aims to identify the major markets for Saudi Arabian religious tourism and estimates the economic elasticities for religious travelling decisions. Therefore, this research is an important contribution to the available literature on religious tourism as well as to tourism demand modelling.

Earlier literature on religious tourism mainly considers the economic contribution of religious activities. However, this research takes a different approach and assesses the role of pecuniary factors such as destination cost, income of the country of origin, travelling cost, and trade volume between the country of origin and country of destination. We also examine

the role of demographic factors such as the size of population in the country of origin in influencing demand for religious tourism.

For religious travel, popular destinations include the Vatican in Rome, Mecca and Madinah in Saudi Arabia, Santiago de Compostela in Spain, Jerusalem in Israel and many others. This study chooses Saudi Arabia as a religious destination and estimates the demand models for six major countries of origin: Egypt, India, Kuwait, Pakistan, Qatar and UAE. These six countries account for more than 65% of total international travellers to Saudi Arabia for religious purposes (Euromonitor, 2017). Pilgrimages to Mecca, known as the *Hajj* and *Umrah*, are the most important faith-based activities for Muslims around the world. Pilgrimage to Mecca, in Arabic the *Hajj*, is the 'last pillar' of Islam, meaning that each physically able and financially capable Muslim is obliged to make the pilgrimage to the holy city of Mecca at least once in his or her lifetime. *Hajj* takes place every year from 8th to 12th *Dhul Hajja* (the last month of the Islamic calendar) and *Umrah* can be performed any time during the year. Although the Saudi economy relies mainly on oil exports, travel and tourism accounted for 3.4% of its GDP in 2017 and religious tourism constitutes 46% of total tourism revenue (WTTC, 2018). The total tourism contribution primarily reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services as well as the wider supply-chain-induced income impacts.

Given the limited research in the area, and recognising religious tourism as the major source of income and employment in Saudi Arabia, this research empirically evaluates the economic and demographic factors which affect the decision to travel from the country of origin to a religious destination. We estimate a religious tourism demand model for each country in the sample and determine the long-term relationship between the dependent variable and the vector of explanatory variables. Earlier literature on estimating the demand models for inbound tourism can be categorised into two groups: firstly, there are studies which estimate the demand for international tourism through classical multivariate regression. These studies were mostly published between the 1960s and the early 1990s. The second group of studies, however, employs different approaches to select models and forecasting, using techniques such as the Autoregressive Distributed Lag Model (ARDL), Vector Autoregression (VAR), and the Vector Error Correction Model (VECM). In addition, there are a few studies available which employ the

gravity model: these studies include Kaplan and Aktas (2016), Balli, Balli, and Louis (2016), Chasapopoulos *et al.* (2014), Morley *et al.*, (2014), Dilanchiev, A. (2012), Eryigit, Kotil, and Eryigit (2010), Durbarry (2008) and Grosche, Rothlauf, and Heinzl (2007). However, Sheldon and Var (1985) argue that gravity models assume that tourism flows from region A to region B are similar to those from region B to region A, which is not common in the case of tourism flows.

Methodological Approach

The current research constructs demand models for inbound religious tourism using a three-step procedure. Following Pesaran *et al.* (2001), first we investigate the existence of a long-run relationship between the number of tourist arrivals for religious purposes in the Kingdom of Saudi Arabia (KSA) and a set of explanatory variables such as income, relative price, population, trade, and travelling cost, while using a bound testing approach. For this purpose we specify an Autoregressive Distributed Lag (ARDL) model for each country in the sample. After the confirmation of a long-run relationship, we calculate point estimates of the long-run effects of selected explanatory variables and finally we construct bootstrap confidence intervals to evaluate the statistical significance of these point estimates.

This research finds that selected economic and demographic variables have a significant role in influencing spiritual travelling decisions, even though faith-based tourism is considered as a purely religious activity. This research identifies the significant influence of GDP per capita, suggesting that higher income in the country of origin induces more religious tourists' arrivals in destination country. A major finding of this research is of a positive relationship between the price of tourism in Saudi Arabia (KSA) and the number of religious tourist arrivals from each country in the sample. This study identifies religious tourism as a 'Veblen good' which is related to the social status of the people in the country of origin. Theoretically, a Veblen good is a product or service for which demand increases as its price increases; these expensive products and services reflect the high social status of the consumers. Inbound tourism is generally considered as a Veblen good because only high-income people can afford to undertake international travel. This finding is supported by two related arguments: firstly, the presence of a positive relationship (exceeding unity) between GDP per capita and the number of religious tourist arrivals in KSA

indicates that religious tourism is a luxury product, and secondly; according to Islamic values, only a financially capable person is obliged to perform *Hajj* or *Umrah*. Furthermore, this research highlights a positive and significant impact on religious tourism both of population size in the country of origin, and of volume of trade between the country of origin and country of destination. This research further identifies the negative influence of a crude oil price increase (as proxy for travelling cost) on spiritual-based travelling for non-oil exporting countries in the sample.

The rest of the paper is organised as follows: section three describes the empirical model; section four provides the bound testing approach and ARDL modelling procedure, followed by the discussion of results in section five. The Final section presents concluding remarks.

Empirical Model

We start our analysis by developing a theoretical model to represent monthly demand for religious tourism for each country in the sample.

$$A_{it} = f [P_{it}, M_{it}, N_{it}, TR_{it}, TC_t, D_t] + \epsilon_t \quad \forall i = 1 \dots k, t = 1 \dots T \quad (1)$$

where A_{it} is a dependent variable to measure the demand for religious tourism. To choose an appropriate measure of tourism demand, Kim (1988) classifies the available indicators based on four criteria; level of activity, money spent, time consumed and distance travelled. However, Song *et al.* (2010) identify only activity-based and pecuniary-related criteria as the widely used measures of tourism demand, reflecting consistency in the availability of data. Since each measure of tourism demand serves a different purpose, we therefore select the number of tourist arrivals as the measure of demand for religious tourism, and it has a direct impact on the supply capacity of product / service suppliers, such as hotels and airlines, for example. The choice of this measure is also relevant, as the Saudi Government has introduced an expansion plan to raise the number of pilgrims and in that context our study becomes an important document.

To model the determinants of demand for religious tourism, this research relies on consumer theory for the selection of relevant variables. Lim (1997) reviews 100 empirical studies on modelling international tourism

demand and identifies income, relative prices, and transportation cost as the major explanatory variables. In addition, Crouch (1994) suggests international travel as luxury consumption since income elasticity generally exceeds unity. Price is another important component of any demand model. However, determination of price in a tourism demand model is a challenging task, as there is no single price index which can serve the purpose. The price variable for tourism represents the price of reaching a destination and the cost of living in the destination country and it is inversely related to demand for religious tourism in the country of origin i . Following Durbarry and Sinclair (2005) and Song *et al.* (2010), we calculate relative price (P_{it}), which represents the price of religious tourism in KSA at time t and it is defined as the following:

$$P_{it} = \frac{CPI_{KSA}/EX_{KSA}}{CPI_i/EX_i} \quad (2)$$

where CPI_{KSA} and CPI_i represent the consumer price indices for the host country and country of origin respectively; EX_i and EX_{KSA} are the exchange rate indices (2010=100) for the country of origin i , and destination country (KSA) respectively. The exchange rate is an index of local currency to US Dollars (2000=100) and Nominal Effective Exchange Rate (NEER) is an indicator of this index.

Religious travelling decisions involve individual choices. Therefore we use real GDP per capita at constant prices(2000=100) as the measure of personal income and M_{it} represents the level of personal income in the country of origin i at time t . N_{it} represents the population size of the country of origin, TR_{it} indicates the net trade volume between the destination country and country of origin. Transportation expense is another important component of tourism cost and TC_{it} indicates travelling cost from the country of origin to the destination country. We select crude oil price as the proxy variable (Lim, 1997; Nelson *et al.*, 2011), D_t is the dummy variable to capture the effects of one-off events (*Hajj*) and the residual term ϵ_{it} reflects the impact of all excluded variables in this religious tourism demand model. We employ monthly data covering time span 2004 M1 - 2015 M12 and all variables are expressed in logarithmic form. The study extracts the data related to consumer price indices, NEER, GDP and population

Table 1: Description of Sample Variables

Variable	Proxy	Data Source	Expected Outcome
Exchange rate adjusted relative price	Nominal effective exchange rate (NEER), CPI _{KSA} and CPI for each country of origin in the sample and for host country (Saudi Arabia).	International Financial Statistics (2015)	$\beta_1 < 0$
Personal income	Real GDP per capita at constant prices (2000=100)	International Financial Statistics (2015)	$\beta_2 > 0$
Size of population	Size of population in the country of origin	International Financial Statistics (2015)	$\beta_3 > 0$
Trade volume	Trade volume between the country of origin and country of destination	Trade Statistics	$\beta_4 > 0$
Transportation cost	Crude oil price	International Energy Agency	$\beta_5 < 0$
One-off event (<i>Hajj</i>)	Dummy for the month of <i>Hajj</i>	Islamic Calendar	$\beta_6 > 0$

size from International Financial Statistics, and data on the number of religious tourists is taken from the publications of the Tourism Information and Research Centre, Saudi Arabia. Data pertaining to trade volume between the country of origin and destination country are collected from each country's trade statistics. Since GDP data are available annually, the series is converted into a monthly series using the 'cubic match last' method, which assigns the annual value to the last month of the year, and values for interim months are interpolated through cubic spline criteria. Our estimation suggests dummy variable as statistically insignificant and therefore, we omitted this variable from our model. The price of substitute destinations is not included in the model, since few religious destinations are available which hold the same spiritual and geographical characteristics as Mecca and Madinah which are the holiest cities for Muslims.

Methodology

Checking for a long-run relationship

At the first stage, this research examines the presence of a long-run relationship between the dependent variable and vector of explanatory variables [$P_t, M_{it}, N_{it}, TR_{it}, TC_t, D_t$]. Earlier approaches developed by Engle and Granger (1987) and Johansen and Juselius (1990) are constrained by the fact that they are applicable only when all variables are integrated of the same order. However, Autoregressive Distributed Lag (ARDL) bounds testing approach proposed by Pesaran *et al.* (2001) tests the long-run relationship between variables. Either these are I (0) or I (1) or a combination of both (De Vita and Abbott, 2002) except the fact that variables should not be I(d) with $d \geq 2$

(Nyasha and Odhiambo, 2014). While using the ARDL bound test, we can also derive an error correction model (ECM) (Banerjee *et al.*, 1993) to specify the demand for religious tourism. The ARDL test is advantageous because it allows a sufficient number of lags (Laurenceson and Chai, 2003) and it is more efficient for finite sample data sizes (Pesaran and Shin, 1999). To investigate the long-run relationship, we can transform Equation (1) into an ARDL model as follows:

$$\begin{aligned}
 \Delta \ln A_{it} = & \alpha_1 + \sum_{j=0}^p \alpha_2 \cdot \Delta \ln A_{i,t-j} + \sum_{j=0}^p \beta_1 \cdot \Delta \ln P + \sum_{j=0}^p \beta_2 \cdot \Delta \ln M_{i,t-j} \\
 & + \sum_{j=0}^p \beta_3 \cdot \Delta \ln N_{i,t-j} + \sum_{j=0}^p \beta_4 \cdot \Delta \ln TR_{i,t-j} \\
 & + \sum_{j=0}^p \beta_5 \cdot \Delta \ln TC_{i,t-j} + \beta_6 \cdot D_t + \omega_1 \cdot \ln A_{i,t-1} \\
 & + \gamma_1 \cdot \ln P_{i,t-1} + \gamma_2 \cdot \ln M_{i,t-1} + \gamma_3 \cdot \ln N_{i,t-1} \\
 & + \gamma_4 \cdot \ln TR_{i,t-1} + \gamma_5 \cdot \ln TC_{i,t-1} + \epsilon_t
 \end{aligned}
 \tag{3}$$

where A_{it} is the dependent variable, number of tourists arrivals in KSA for religious purpose from country i at time t , and [$P_{it}, M_{it}, N_{it}, TR_{it}, TC_t, D_t$] is a vector of independent variables, p indicates the optimal lag length and Δ is first-difference operator, α_{it} , β_{ij} are short-term parameters, and lastly ϵ_t is the disturbance term. To examine the long-term relationship between the variables, we use the F test on the joint null hypothesis that $\omega_1 = \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$ and F statistics have non-standard distribution with the null hypotheses of no relationship between the dependent variable A_{it}

and the vector of explanatory variables. Pesaran *et al.* (2001) suggest asymptotic critical value bounds for F statistics to test the null hypothesis of no long-run relationship between the selected variables. If this statistic exceeds its respective upper critical bound we reject the null hypothesis and vice-versa. However if the statistic lies between these critical bounds then we cannot make conclusive inference.

Religious Tourism Demand Model

If the bound test confirms the existence of a long-term relationship between the demand for religious tourism and independent variables, then we estimate the long-run equilibrium relationships and short run dynamics through the conditional error correction representation of the ARDL model specified in Equation 3. We follow a general to specific approach (Hendry, 1993) which implies that all insignificant variables are eliminated and the model contains only significant variables.

We can formulate a conditional error correction model (ECM) from the ARDL model specified in Equation (4) as follows:

$$\Delta A_{it} = \alpha_t + \sum_{j=1}^{\rho} \alpha_j \cdot \Delta A_{t-j} + \sum_{i=1}^K \sum_{j=0}^{\rho-1} \beta_{ij} \Delta Z_{i,t-j} + \lambda_i \cdot W_i + \omega A_{i,t-1} + \sum_{i=1}^K \gamma_i Z_{t-1} + \varepsilon_t \quad (4)$$

where $Z_{i,t}$ is the vector of explanatory variables, $Z_{i,t} = [P_{i,t}, M_{i,t}, N_{i,t}, TR_{i,t}, TC_t, D_t]$, W_i is tendency and λ is related parameter, first difference is set to zero to achieve an equilibrium, therefore γ_i and ω represent long-term adjustment parameters.

Long Run Effects and Bootstrap Confidence Intervals

Following Bardsen (1989), we use the long-run coefficients of the estimated model in Equation (4) to evaluate the effects of selected independent variables on religious tourism demand in KSA;

$$\hat{\tau}_i = -\frac{\hat{\gamma}_i}{\hat{\omega}} \forall i = 1, \dots, K \quad (5)$$

Where $\hat{\gamma}_i$ and $\hat{\omega}$ are the long run coefficients.

However $\hat{\tau}_i$ does not show the degree of variation in the long-run effect and there is no information about its statistical significance. Song *et al.* (2010) suggest confidence intervals for each $\hat{\tau}_i$, which helps to approximate its variability with statistical significance. As $\hat{\tau}_i$ is not normally distributed, we use the bootstrap method which allows construction of confidence intervals without any specific distribution of $\hat{\tau}_i$ (Efron and Tibshirani, 1998).

Estimation and Results

This study employs the ARDL bounds testing approach to examine the long-run relationship between the demand for religious tourism to KSA and selected explanatory variables. According to Pesaran, Shin and Smith (2001), the ARDL bounds test is valid only for those variables which are I (0) and I (1). Therefore, to determine the order of integration for selected variables, we conduct Augmented Dickey-Fuller (ADF) and Phillips-Perron (P-P) unit root tests. However, we are reporting only the Phillips-Perron (P-P) unit root test as this study does not find any significant difference in the test results. A unit root test primarily examines the presence of a stochastic trend in a data series. The Phillips-Perron unit root test and ADF test differ mainly because of their considerations about heteroskedasticity and serial correlation in the errors. The P-P test is advantageous, as it is robust to general forms of heteroskedasticity in the errors and we do not need to specify the lag length for the test regression.

Table 2a and 2b present both tests to check the order of integration for each variable at levels and at first difference using trend and intercept. These results reveal that all variables are integrated either I (0) or I (1) but none of them is I (2) which provides a basis to employ ARDL approach to determine the long term cointegration relationship between the variables. Following Pesaran and Pesaran (1997), we take the maximum number of lags ($\rho = 12$) of the conditional error correction model (ECM) specified in Equation 3, since the number of lags must be large enough to avoid the problem of serial correlation while considering the issue of over parameterisation. We select the optimal number of lags ($\rho = 2$) using the Akaike Information Criterion (AIC) and Schwarz-Bayesian criteria (SBC). We estimate the F statistics using two scenarios; firstly, restricted intercept without trend (F0) and then restricted intercept with trend (F1).

	Egypt	India	Kuwait	Pakistan	Qatar	UAE
	P-P	P-P	P-P	P-P	P-P	P-P
A	-8.69	-9.71	-6.56	-6.71	-5.56	-3.21
P	-0.71	-3.65	-1.87	-1.71	-3.01	-2.91
M	-1.04	-1.25	-1.99	-2.76	-2.66	-2.75
N	-3.98	-5.56	-3.05	-2.01	-2.4	-1.43
TR	-2.31	-3.42	-2.82	-2.88	-1.79	-1.42
TC	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56

	Egypt	India	Kuwait	Pakistan	Qatar	UAE
ΔA	-9.12	-8.27	-9.01	-9.61	-9.54	-8.99
ΔP	-7.29	-6.17	-7.09	-7.15	-4.45	-5.64
ΔM	-3.87	-3.81	-4.13	-5.68	-3.36	-4.13
ΔN	-3.69	-5.32	-4.21	-8.87	-3.81	-8.83
ΔTR	-4.25	-4.72	-4.23	-4.6	-3.47	-7.52
ΔTC	-9.34	-9.34	-9.34	-9.34	-9.34	-9.34

Table 3 reports the calculated F statistics with critical bounds (estimated by Pesaran *et al.*, 2001) for each country and it reveals that estimated F (0) and F (1) statistics are above the 1%, 5% and 10% significance levels. These findings reject the null hypothesis of no co-integration and provide the evidence that there is a long-run relationship between demand for religious tourism and the vector of independent variables.

After confirmation of the long-run relationship between the variables, we develop a demand model for religious tourism in KSA, which is derived from ECM specified in Equation 4. This model follows a general

to specific approach, using ordinary least squares and eliminates all the insignificant variables except the lagged variables at level, since these variables indicate the co-integration relationship. The process of elimination continues until all differenced variables become statistically significant at least at 10% significance level.

Table 4 presents the estimation results for the long-run relationship between the demand for religious tourism in KSA and explanatory variables (\hat{y}_i and $\hat{\omega}$) for each country in the sample. The estimation results

Country	Test Statistic - F		Critical Values for Bounds Test			
			Significance Level	Constant & without trend	Constant & trend	
Egypt	F(0)	6.44**	1%	I(0)	3.35	3.73
	F(1)	9.13**				
India	F(0)	9.82**	5%	I(1)	4.587	5.16
	F(1)	9.41**				
Kuwait	F(0)	9.01**	10%	I(0)	2.55	2.79
	F(1)	9.21**				
Pakistan	F(0)	9.49**	10%	I(1)	3.61	4.02
	F(1)	10.09**				
Qatar	F(0)	7.08**	10%	I(0)	2.30	2.36
	F(1)	8.85**				
UAE	F(0)	6.22**	10%	I(1)	3.15	3.5
	F(1)	7.23**				

**shows the calculated F statistic falls above the upper level of the band. F(0) indicates the F statistic of the model with unrestricted intercept and restricted trend, F(1) shows the F statistic of the model with unrestricted intercept and trend, Critical values for F statistics are from Naryan (2004).

Table 4: Error Correction Representation of ARDL Model

	Egypt	India	Kuwait	Pakistan	Qatar	UAE
$\hat{\alpha}_t$	-1.53 (-1.29)	7.13 (2.17)	-0.76 (-2.69)	8.27 (3.32)	15.25 (1.67)	6.42 (1.76)
$\hat{\omega}$	0.64 (3.67)	0.22 (3.89)	0.41 (2.73)	0.43 (3.25)	8.93 (3.28)	2.25 (3.43)
$\hat{\gamma}_P$	1.87 (0.61)	2.71 (3.38)	0.004 (3.18)	0.64 (3.57)	17.67 (2.9)	9.9 (3.28)
$\hat{\gamma}_M$	0.39 (3.51)	5.14 (2.97)	0.66 (3.71)	0.86 (3.54)	1.65 (2.67)	13.9 (2.13)
$\hat{\gamma}_N$	0.29 (3.42)	3.73 (2.19)	0.089 (2.84)	1.31 (2.65)	24.09 (3.6)	14.8 (2.21)
$\hat{\gamma}_{TR}$	0.69 (2.59)	4.44 (2.53)	0.38 (2.61)	2.47 (1.80)	1.97 (3.12)	7.96 (2.7)
$\hat{\gamma}_{TC}$	-0.89 (-4.71)	-0.41 (-3.26)	0.31 (2.21)	-0.81 (-3.65)	1.26 (2.45)	0.03 (1.85)
$\hat{\lambda}_i$	-0.76 (-5.32)	-0.71 (-4.30)	-0.91 (-4.68)	-0.97 (-8.61)	-0.92 (-6.14)	-0.96 (-5.28)

** *t* values in parenthesis.

show a positive and statistically significant relationship between GDP per capita and demand for religious tourism in KSA for all countries of origin in the sample. The sample for this research consists of both rich (Kuwait, Qatar and UAE) and relatively lower income countries (Egypt, India and Pakistan). The positive impact of income on the decision to make a religious journey holds for both higher- and lower-income countries and is consistent with theory. Earlier literature on religious tourism primarily considers it as more of a spiritual phenomenon (for example Rinschede, 1992; Craine, 1996; Norman, 2004), and does not provide any linkages between the income and the decision for religious tourism. Hence current research is an important contribution to the literature related to faith-based tourism. Moreover, this research finds a positive relationship between the price and demand for religious tourism for all the countries in the sample. The estimated coefficient $\hat{\gamma}_P$ is positive and statistically significant for all countries except Egypt, which has an insignificant though positive relationship between the two variables. This finding suggests demand for religious tourism is a case of a Veblen good and identifies the decision for religious journeys as an element of social status. In addition, current research also finds a positive and statistically significant relationship between the size of population in the country and the demand for religious tourism in KSA.

The estimated coefficient for trade variable ($\hat{\gamma}_{TR}$) is positive and statistically significant for all countries in the sample which explains a direct relationship between the demand for religious tourism in the country of origin and volume of trade between the

country of origin and the country of destination. To examine the effect of travelling cost on the decision to travel for religious purpose to KSA, we employ the international price of crude oil as a proxy for travelling cost. The estimated coefficient $\hat{\gamma}_{TC}$ is negative and statistically significant for lower income countries in the sample (Egypt, India and Pakistan) which implies that an increase in the international price of crude oil will reduce the number of tourists for religious purposes in Saudi Arabia. However $\hat{\gamma}_{TC}$ is positive for higher-income countries in the sample (Kuwait, Qatar and UAE) which can be attributed to the fact that these countries have oil revenue based economies and any increase in the international oil price may lead to higher demand for religious tourism in KSA. The lagged error correction term has the expected sign and is statistically significant for all countries in the sample. Its value ranges between -0.71 to -0.96 for the sample which indicates a higher speed of adjustment to equilibrium.

Table 5 provides an analysis of diagnostic tests on residuals to assess the statistical and theoretical appropriateness of the selected model. The adjusted R-square is considered as a measure of goodness of fit. Its values are greater than 50 percent for all countries which suggests that all models are correctly specified. The Breusch–Godfrey Lagrange multiplier (LM) test is insignificant for all models, which confirms that there is no serial correlation in the residuals of all the demand models in the sample. Insignificant autoregressive conditional heteroskedastic (ARCH) and Jarque Bera tests reveal that the disturbance terms in all equations are homoskedastic and normally distributed. However, estimates in Table 4 provide

Table 5: Diagnostic Test

Test	H ₀ Hypothesis	Egypt	India	Pakistan	Kuwait	Qatar	UAE
\bar{R}^2	Measure of goodness of fit	0.693	0.667	0.77	0.62	0.55	0.56
Godfrey-Breusch Test (c^2)	No autocorrelation	1.045	0.847	0.582	1.165	0.891	1.437
Jarque-Bera Test	Residuals are normally distributed	0.394	0.529	0.431	0.476	0.563	0.547
ARCH Test (c^2)	No autoregressive conditional hetroskedasticity effect	0.523	0.439	1.283	1.86	1.07	1.98

only the information about the direction of relationship and its statistical significance between the set of explanatory variables and demand for religious tourism in the long run but it does not quantify the intensity of the influence of each explanatory variable in the sample to affect the religious tourism demand. For this purpose, we use the estimated coefficients $\hat{\gamma}_i$ and $\widehat{\omega}$ to calculate point estimate $\hat{\tau}_i$ for each explanatory variable in the model as specified in Equation 5. However we cannot employ traditional inference methods for these point estimates as they are not normally distributed. Following Efron and

Tibshirani (1998), we use bootstrap confidence intervals to evaluate the statistical significance for each point estimate given in Table 6. Bootstrapping methodology enables us to calculate confidence intervals without assuming any specific distribution of the point estimate $\hat{\tau}_i$.

Table 7 presents the bootstrap confidence intervals with 95% confidence level. The estimated coefficients of point estimate $\hat{\tau}_P$ are positive and statistically significant for all countries in the sample, as bootstrap confidence intervals do not overlap zero for any

Table 6: Estimation of Long-Run Effects- Point Elasticity of Demand for Religious Tourism

	Egypt	India	Kuwait	Pakistan	Qatar	UAE
$\hat{\tau}_P$	0.409	3.187	0.734	8.562	0.966	7.039
$\hat{\tau}_M$	0.758	2.332	0.507	5.260	0.030	5.692
$\hat{\tau}_N$	3.402	5.049	0.323	6.361	0.188	5.449
$\hat{\tau}_{TR}$	1.092	4.019	-0.187	4.091	0.052	-6.443
$\hat{\tau}_{TC}$	-0.974	-0.817	0.474	-4.921	0.147	0.611

Table 7: 95% Confidence Intervals for Long-Run Elasticities

	Egypt	India	Kuwait	Pakistan	Qatar	UAE
$\hat{\tau}_P$	0.089, 0.729	0.68, 5.777	0.156, 1.312	4.072 , 13.062	0.205, 1.727	3.498, 11.58
$\hat{\tau}_M$	0.237, 1.279	0.923, 3.842	-3.091, 4.962	3.136, 7.382	-5.659, 6.157	3.045, 7.759
$\hat{\tau}_N$	1.498, 5.655	1.279, 2.758	0.109, 0.644	3.131, 9.031	0.113, 1.304	1.227, 9.958
$\hat{\tau}_{TR}$	0395, 1.868	1.258, 6.898	-3.047, 2.313	1.912, 8.001	-0.342, 0.341	-8.132, -4.346
$\hat{\tau}_{TC}$	-1.688, 0.309	-1.141, -0.586	0.115, 0.858	-7.572, -1.299	0.039, 0.423	0.658, 1.760

**We use the accelerated bias-corrected method to construct bootstrap confidence intervals with 10,000 replications.

country. The magnitude of the point estimate $\hat{\tau}_P$ is greater than one for most of the countries in the sample except Egypt and Qatar, indicating that demand for religious tourism is highly sensitive to price. In addition, a positive $\hat{\tau}_P$, reflects religious tourism demand as a Veblen good. Demand for religious tourism is highly income-elastic for all the countries in the sample except Kuwait and Qatar, Related confidence intervals for both countries are -3.091, 4.962, and -5.659, 6.157 respectively, indicating that people respond positively to income changes in these two countries but the level of income is not a major concern in making a decision for religious tourism.

Furthermore, increase in population size of the country of origin has a positive effect on demand for religious tourism in KSA. Table 6 shows that demand for religious tourism is highly sensitive to changes in population size: point estimate $\hat{\tau}_N$ for all countries is more than one except in Kuwait and Qatar but statistically significant, showing a 1% increase in population will increase the demand for religious tourism by 3.4% in Egypt 5% in India, 0.32% in Kuwait, 6.3% in Pakistan. 0.19% in Qatar and 5.4% in UAE. Trade elasticities of demand for religious tourism in KSA are positive, more than one in magnitude and statistically significant at 95% bootstrap confidence level for lower-income countries in the sample.

Finally, this research finds a negative and statistically significant relationship between travel cost (measured by international oil price) and the decision to travel for religious purposes by the people of low-income countries in the sample. This finding suggests that a fall in the international oil price will motivate more people to visit KSA for religious purposes. However,

$\hat{\tau}_{TC}$ is positive with bootstrap confidence intervals without zero at 95% confidence level for higher income countries in the sample, which implies that an increase in the international oil price will lead to more revenues for these oil-based economies and, in turn, more travelling to KSA for religious purposes.

Conclusion

This research aims to find the empirical linkages between economic factors and decisions to travel for religious purposes to the Kingdom of Saudi Arabia (KSA) through the identification of six major markets for Saudi religious tourism. The study considers GDP per capita, relative price (cost of tourism), trade volume between the country of origin and country of destination, population size, and travelling cost as the possible economic factors. Demand for religious tourism is represented through the number of tourists travelling for religious purposes to KSA from the selected countries of origin. This research takes monthly data covering 2004 M1 to 2015 M12 while employing an ARDL bounds testing approach and conditional error correction model.

Our findings suggest that religious tourism is a Veblen good, especially for low-income countries in the sample. We also find that GDP per capita has a positive influence on the decision to travel for religious purposes. The size of the population and the volume of trade directly affect the number of tourists for religious purposes to KSA from all countries of origin in the sample, except Kuwait and Qatar where trade volume is inversely related to the number of religious tourists to KSA. Our findings confirm that higher travelling costs leads to lower numbers of tourists for religious purposes, especially from lower-income countries in the sample. This research is an important contribution to the current literature on religious tourism as it is one of the few studies to provide an empirical basis to link faith-based tourism and economic influences. It is the first study in tourism literature which identifies religious tourism as a Veblen good and identifies economic variables like GDP per capita, population size, trade volume, and travelling cost as the major determinants of demand for religious tourism in KSA.

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