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INTERNATIONAL TOURISM DEMAND IN BANGLADESH: AN ARDL BOUNDS TEST APPROACH

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ABSTRACT

Tourism can somewhat be compared to the Cinderella industry, much because of its development being unattended despite having immense potentials in generating development within an economy. This paper aims to fill the gap in the literature by modeling tourist demand in Bangladesh as a function of its real fundamentals using time series data over the period 1980 to 2017. Augmented Dickey-Fuller (ADF) unit root tests along with the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration and causality analyses are considered. The results reveal that the relative cost of living in Bangladesh and travel costs negatively affect international tourism demand while the relative cost of living in India, national income and exchange rate are found to be positively associated to tourism demand in Bangladesh. Moreover, long run causalities stemming from all the explanatory variables to tourism demand are also established in light of the statistical evidence found. Thus, it is pertinent for the government to escalate tourism development in Bangladesh which can also play a pivotal role in the diversification of the nation's export basket.

Contribution/Originality: To the best of knowledge there is no empirical paper focusing on the international tourism sector of Bangladesh economy. This paper fills that gap by employing a multivariate framework to determine the demand side factors influencing tourism in Bangladesh.

1. INTRODUCTION

In this contemporary era where globalization is at its peak, tourism has become a potential medium of networking beyond national boundaries. The tourism industry with its composite of activities and concrete growing trading opportunities is considered one of the fundamental pillars of the economic development in both developed and developing countries. The exceptional growth of tourism over the last 60 years is one of the most remarkable economic phenomena of the 21st century. Tourism has emerged from being a relatively small-scale activity into one of the world's largest industries and the fastest growing economic sector of the world economy from the 1960s onwards (Sahu, 2013).

The Importance of the tourism industry can be understood based on recent statistics available from the World Travel and Tourism Council (2016). International tourism arrivals across the globe reached a new figure of 1.2 billion in 2015, which was only 25 million in 1950. That represents an average annual growth rate of more than 7% over a period of 65 years-well above the average annual economic growth rate for the same period. Tourism's total contribution to the global economy in 2015 was 7.2 trillion USD which equates to 9.8% of total global GDP. The global tourism industry supported 284 million jobs in 2015 which is equal to 1 in 11 of all jobs in the world. This industry also generated 1.5 trillion USD in exports sector in 2015 which was 6% of the world's exports. Moreover,

international tourism is ranked as the 4th largest industry in the world after fuels, chemicals, and automotive products. It is also worth noting that international tourist arrivals are forecasted to reach the staggering figure of 1.8 billion by 2030. Furthermore, the tourism sector outperformed several other major economic sectors in 2015, including manufacturing and retail. At a country level, direct Travel & Tourism GDP growth outpaced economy-wide GDP growth in 127 of the 184 countries covered by the annual Economic Impact Research in 2015. Examples of economies where Travel & Tourism most markedly outperformed the wider economy in 2015 included Iceland, Japan, Mexico, New Zealand, Qatar, Saudi Arabia, Thailand, and Uganda (WTTC, 2016).

Tourism is believed to be inextricably interconnected to the development goals of the developing countries. Many countries that are in pursuit of embracing economic development have adopted tourism-led development strategies in order to generate the potential economies of tourism development. Moreover, the development roles of tourism are ideally suited to developing nations due to the fact that the tourism industry is labor-intensive in nature and developing nations usually have an abundant supply of labor. As a result, the breadth of international tourism also significantly expanded in recent years to encompass the developing world. In 1950, merely 15 European destinations accounted for 98% of all international tourist arrivals. However, by 2015 that figures had drastically fallen to 54% which provides evidence reflecting diversification in tourist destinations across the world.

Tourism as an additional instrument to speed up the development process has received considerable attention in the developing countries. The most significant economic feature of the tourism industry is that it contributes to three high priority goals of the developing countries: the generation of income, employment and foreign exchange earnings. For example, tourism is a key foreign exchange earner for 83% of developing countries and the leading export earner for one-third of the world's poorest countries. For the world's 40 poorest countries, tourism is the second-most important source of foreign exchange after oil. It is also worth mentioning that, although often underestimated, the tourism industry can also help promote peace and stability in developing countries by providing jobs, generating income, diversifying the economy, protecting the environment, and promoting cross-cultural awareness (United States Institute of Peace, 2013).

The development of tourism sector from the perspective of a developing nation can be enlisted as one of the top most prioritized agendas of its government. However, like any other development strategies, tourism development also has some pre-requisites that are to be met before a sound strategic development plan can be put forward. Thus, at the grass root level, an economy must get accustomed to the determinants of tourist demand and then formulate the tourist sectoral development policy (Vanhove, 2006; Sun *et al.*, 2016). Several researchers have endeavoured themselves in modeling tourist demand, particularly in developing economies. It is also believed that lack of knowledge regarding the determinants of tourist arrivals in a country can contribute to loss of opportunities to generate economies from tourism development. In addition, such deficiency in knowledge can also lead to overestimation of tourist arrivals whereby inappropriate over-investments can fail to generate the expected returns for the stake holders (Louw and Saayman, 2013).

Like any other country, the tourism industry is also viewed as an important sector for the Bangladesh economy as the industry is labor intensive and based on natural resources. Home to the longest unbroken sandy sea beach (Cox's Bazar) and the biggest mangrove area (Sundarbans) in the world, the country has to offer diversified tourist destinations and cultural festivals that can be a treat to the eyes and generate memories worth cherishing. The rare beauty of enjoying sunrise and sunset in fascinating Kuakata, the serene beauty of the swamp forest, the rich tea gardens of Sylhet, the green hills and mountains of the Chittagong Hill Tracts with its streams and valleys flowing in between the mountains can attract attention of tourist from any part of the world. Moreover, there are the traditional celebrations on the first day of the spring (Pahela Falgun), the first day of the Bengali New Year (Nababarsha), and the amazing kite flying festival of the old Dhaka city called the Shakrain could be a colorful experience of culture and heritage across countries. These beautiful festivities are deeply rooted in the Bengali

culture and attract thousands of local and foreign people to come forward and celebrate altogether getting over cultural and political boundaries.

In spite of the immense potentials, tourism in Bangladesh has not yet made its mark globally. Therefore, it is important that the government policy maker comprehends the factors affecting foreign tourism demand. To promote this sector as one of the main contributors to the growth of Bangladesh economy, the key factors influencing the number of international tourist arrivals in Bangladesh need to be unraveled. To the best of knowledge there is no empirical paper focusing on the tourism sector of Bangladesh economy. This paper fills that gap by employing a multivariate framework to determine the demand side factors influencing tourism in Bangladesh. The main objectives of this study are to model the international tourism demand for Bangladesh using relevant data over the period of 1980 to 2017 and draw policy recommendations to enhance the international tourism demand in Bangladesh.

The remainder of the paper is structured as follows. Section 2 provides an overview of tourism demand in a developing economy followed by a discussion on the barriers to tourism sector development in Bangladesh. Section 3 provides the literature review while section 4 discusses the attributes of data and the methodology of research. Moving on, the subsequent sections 5 and 6 provide discussions on econometric test results and concluding remarks followed by policy recommendations.

2. AN OVERVIEW OF INTERNATIONAL TOURISM DEMAND IN THE ECONOMY

The initial part of this section provides a discussion on the different classifications of tourism across the world while the latter part addresses the factors that determine international tourism demand in the less developed countries across the globe.

2.1. Classifications of Tourism

There have been numerous classifications of tourism mentioned in tourism literature. For instance, tourism can broadly be divided into six forms (Vanhove, 2006). The first category of tourism is referred to as Domestic Tourism (DT) which refers to local tourism by the residents of a particular nation. Under this category, the local people tend to visit different destinations within the national boundary. The second classification of tourism is known as Inbound Tourism (IT) which refers to foreign tourist arrivals into the national boundary of the host country. It is worth mentioning that this paper specifically focuses on the inbound tourism demand in Bangladesh. The next category of tourism is commonly known as Outbound Tourism (OT) which, in contrast to IT, local residents travelling to foreign countries for multidimensional motives. Based on the combination of these aforementioned classifications the next three tourism subsets have been put forward. The fourth category of tourism is called Internal Tourism (INT) which basically is the sum of DT and IT. Conversely, the next category, National Tourism (NT) accounts for DT and OT combined involving migration by the local residents only. Finally, the last of the six classifications is referred to as International Tourism (INTT) that involves cross border tourist movements of residents and non-residents. Hence it is a combination of IT and OT.

However, the World Tourism Organization (WTO) classifies tourism in terms of two major types of tourists, based on the duration of stay at a particular destination. The first of the two tourist groups is called International tourist which refers to travellers who have visited a foreign destination and have stayed there for more than a day but less than a year. The WTO puts more emphasis on the duration of stay since an international visit lasting for less than 24 hours is not recognized as a tourist visit, rather it is referred to as an excursion. The other WTO classification of tourist is known as Domestic tourist which covers local travellers travelling to different parts of the home country and having a duration of stay of less than 24 hours. Hence, WTO classifies the broad concept of tourism into international and domestic tourisms.

2.2. Factors Determining Tourism Demand in an Economy

There are many pull and push factors adhering inbound tourism demand in a particular nation. These include both economic and non-economic factors, all having the power to influence the volume of tourist arrivals in a particular country. The factors determining dynamics of inbound tourism include:

2.2.1. Income of the Tourist Origin

It is quite evident that engagement in international tourism, in particular, involves expenses that are to be covered by the travellers. Thus, income plays a crucial role in determining tourist arrivals in a country. Income refers to the national income of the tourist origin with the understanding that the higher the national income per capita the more the willingness of the travellers to travel in various desired destinations. National income per capita has been used in many tourism studies to denote real disposable incomes of travellers in general (Song *et al.*, 2010; Park *et al.*, 2011). Thus, positive linkage between tourist income and tourism demand can be expected.

2.2.2. Relative Cost of Living

As mentioned earlier, international tourism engagement is subject to expenses. As a result, price comes into play determining the relative cost of living in a foreign destination compared to an alternative destination in some other country. A plausible reasoning behind considering the relative cost of living as a key determinant of tourism demand could be the fact that it may directly influence tourism decision. A rational traveller in most cases would choose to visit a country in which the relative cost of living is less than that in another country simply because lower costs would enable him/her to get greater value for money.

2.2.3. Exchange Rate

Exchange rates are believed to influence decisions regarding tourist destinations much like the manner in which they determine export competitiveness of a particular nation. A high bilateral exchange rate in favor of the travellers' currencies of origin would definitely influence their decisions in travelling to a particular country since it will raise their purchasing powers. Conversely, unfavorable exchange rates would have negative impacts on the purchasing power of tourists in foreign destinations. Thus, it is often believed that fluctuations in real exchange rates tend to make travellers vulnerable and as a result of prior knowledge regarding exchange rates is very important in making tourist decisions.

2.2.4. Economic Openness

Much like trade openness influencing the volume of international trade, an open economy is more likely to attract greater volumes of tourism demand compared to a country having a relatively less degree of economic openness. It is empirically acknowledged that globalization is inextricably associated to economic openness and as a result it shall also determine the number of tourist arrivals. According to Ibrahim (2011) an open economy provides opportunities for international trade engagements whereby a majority portion of the total volume of inbound tourism in that economy could be accounted by international tourists travelling for business purposes. Hence, a positive relationship between economic openness and tourism demand can be expected.

2.2.5. Political Stability

A stable political environment within a country is crucial in determining its inbound tourism demand simply because a rational traveller would not be keen in visiting a foreign destination that is characterized by political instability compromising the traveller's safety issues.

2.2.6. Travel Cost

Once again the significance of cost in determining travel decisions is highlighted through the relative travel costs. This is because high travel fares tend to drive up transportation costs and negatively impact inbound tourism demand. Whereas, lower travel costs can raise the purchasing power of a tourist providing more resource for non-transportation expenditure. Thus, travel cost is expected to be negatively associated with tourism demand.

Apart from these determining factors, there are other economic and non-economic factors determining the tourism demand, in a particular country, for which dummy variables can be taken in order to investigate their individual and combined effects on inbound tourism demand.

2.3. Barriers towards Tourism Sector Development in Bangladesh

There are numerous reasons those stand as barriers to the development of the tourism sector in the developing nations, to which Bangladesh is no exception. Tourism in Bangladesh can be compared with the "Cinderella' industry

2.3.1. Lack of promotion

A crucial step towards promoting the various tourist attractions and facilities of a country is its marketing activities. The National Tourism Organization of the country, Bangladesh Parjatan Corporation, is responsible for promotional activities of the tourism industry. The organization, however, does not seem to have done a remarkable job in carrying out its designated responsibilities. As a result, Bangladesh is inappropriately known to foreigners for its dense population, high crime rate, widespread corruption and few other negative attributes. The people hardly know about the good attributes of the country, such as its aristocratically rich culture, palatable Bengali cuisine, its historic places nor its mind-boggling beautiful geographical locations.

2.3.2. Underdeveloped Tourism Infrastructure

Even though the nation is on the verge of attaining the prestigious tag of a middle-income country, the tourism sector of the country still lags behind following poor tourism infrastructure. The sector fails to provide proper and good quality modes of transportations, accommodation, skilled tourist personnel, modern recreational facilities, tourist-centric entertainment venues such as amusement parks, shopping malls, music venues, theatres etc. and other services such as money exchanges, hospitals, banking facilities etc. Poor infrastructure is one of the leading factors upholding tourism development in Bangladesh.

2.3.3. Lack of Tourist Security

Safety and security are matters of great concern for both local and foreign travelers. Any sorts of movement on the roads are considered risky as road accidents are a daily phenomenon. Numerous road accidents occur every single day which are unaccounted for. Moreover, pick pocketing, hijacking and other forms of illegal activities are extremely common on the streets. In addition, lack of help from the law enforcement agencies make matters worse for the travelers.

2.3.4. Language Barrier

Majority of Bangladeshis, especially in the rural areas where most of the naturally picturesque tourist spots are on offer, cannot speak in English. Moreover, literacy levels are low and hence reading English or Bangla is difficult for the majority of locals. This can stand as a big barrier for foreign travelers as they would find it very difficult to communicate which could be a reason behind lack of attractiveness as a potential country of the visit for the foreigners.

2.3.5. Lack of Community Support

Sometimes, local people act hostile towards foreigners if they find that the activities by the travelers are bringing disruptions to their day to day activities. Moreover, sometimes, travelers may find it a little awkward carrying on with their activities as the local people show intense curiosity towards the travelers, intruding their privacies. Furthermore, to make the experience difficult for travelers, the local restaurants at times fail to offer clean and safe drinking water and hygienic foods to the travellers which may lead to health problems.

2.3.6. Lack of Political Stability

A major issue that stands as a hindrance in attracting foreign tourists to Bangladesh is the political instability within the country which not only acts as a barrier to the development of the tourism sector but also impedes development prospects of the overall economy as well (Murshed and Ahmed, 2018; Murshed and Mredula, 2018). People, especially foreigners, do not feel safe to travel around in countries which have political unrest on a regular basis. Hence, the political situation needs to be stable and under control so that people feel safe to travel around the country.

2.3.7. Lack of Government Expenditure and Private Initiative

Most of the tourist spots in Bangladesh are under the control of its government. Since the government often does not have adequate funds to maintain and develop these sites, many of the historical places, as well as other tourist spots, have remained underdeveloped and the scenario is becoming gloomier by the day. Moreover, lack of private entrepreneurship in the tourism sector also does not create a scope of improvement for the tourist spots.

2.3.8. Lack of Research and Development Expenditure on Tourism

Very few educational institutions of the country offer studies on tourism and hotel management. As such, there are an inadequate number or tourism experts who can contribute to the development of the sector. Besides, there are hardly any initiatives of survey and analysis in the context of international tourist spots. Lack of technical expertise adhering the tourism sector is a major constraint upholding its development drives.

3. LITERATURE REVIEW

This section has been divided into two subsections. The former subsection focuses on the theoretical framework linking to international tourism demand while the latter sheds light on the relevant empirical evidence documented in the existing literature.

3.1. Theoretical Framework

The relative importance of developing the tourism sector within an economy is pretty much in line with the economy's overall development. The effects of tourism are multidimensional in nature which furthermore gives voice to the adoption of appropriate policy initiatives aimed at tourism development. In principle, there are three channels through which tourism affects an economy. The primary effects of tourism are referred to as the direct effects while the secondary effects are called indirect and induced effects.

3.1.1. Direct Effects of Tourism Spending

The direct effects of tourism refer to the primary effects that take place immediately a tourist expends upon consumption of a tourism product in the form of a service or good in the tourism sector. There is a whole list of tourism products according to which the United Nations World Tourism Organization (UNWTO) classifies the services and goods tourists may expect to consume during their visit to a foreign destination. The direct effect may include the rise in the income of the hotel in which a tourist has checked in and paid the room rent. It may also

include the transportation fees paid by the tourist to the local transport service providers while roaming around the tourist destination. So these are somewhat like the instant effects of tourism which take place immediately when the tourist spends money in a foreign destination. Usually, these effects are confined to a small scale rather than a widespread social effect that follows later on. Although the contribution of these direct tourism effects to the overall GDP of the host nation is nominal in percentage terms, they contribute heavily in terms of employment generation, especially in the service sector.

3.1.2. Indirect Effects of Tourism Spending

The indirect effects of tourism are referred to as the secondary effects that take place once the money spent by the tourist flows into the others sectors of the host economy, creating socioeconomic development within the host nation. For instance, tourism is considered to be a great source of foreign exchange much like exports of goods and services. Thus, it helps the developing nations in particular through foreign currency accumulation which has multidimensional roles to play in the attainment of economic development in the host country. An increase in government expenditure could be an example of indirect tourism effect because tourism expenditure also contributes to public revenue in the form of service taxes paid by the tourists. Similarly, employment generation on other sectors of the economy can also be classified as an indirect effect of tourism simply because the accumulated tourism revenue acts as finance for new investments in the host economy which in turn generates positive impacts in its macroeconomic indicators. Hence, the contribution of indirect tourism effects on the host nation's GDP is quite high in percentage terms compared to that accounted by the direct tourism effects.

3.1.3. Induced Effects of Tourism Spending

The induced effects of tourism can be viewed from the perspective of an additional household of company expenditure that has been possible due to a rise in income levels following the creation of jobs through the indirect and direct tourism spending effects channels. For instance, a rise in household income is synonymous to a rise in total household consumption expenditure, which ultimately leads to value addition at aggregate levels. Thus, tourism spending contributes to the aggregate demand within the host economy via its induced effects. A rise in household purchasing power can also be interpreted as an improvement in the household standard of living which has broader macroeconomic implications.

3.2. Empirical Findings

Existing literature has mainly focused on tourist flows and receipts and paid little attention to the determinants of the tourism industry in the developing countries. For example, Lim (1997) and Song and Witt (2000) considered tourism demand as a set of tourist products that the consumers are willing to obtain in a specific period. The potential determinants can be classified into the following categories: socioeconomic factors, such as, income level, relative prices between the origin and the destination places, demography, urbanization and length of the leisure time; technical factors related to easier communications and transport facilities; psychological and cultural factors reflecting personal preferences and the style of life of the potential travelers; and random factors related to unexpected events, like political instability, weather conditions, natural disasters, epidemic diseases, etc (Carey, 1991).

Halicioglu (2004) examined an aggregate tourism demand function for Turkey using time series data for the period 1960-2002 and revealed that total tourist arrivals into Turkey were related to world income, relative prices, and transportation cost. Many studies argue that the log-linear single equation model, which considers annual country-specific data, proved to be better than the linear models (Crouch, 1994; Lim, 2004). Although Ordinary Least Square (OLS) estimation is often popularly used, violation of any assumption of the Classical Linear Regression Model (CLRM) would increase the possibility of having invalid results. Kulendran and Witt (2001) also

looked at the different methodologies applied to international tourism demand. They compared the least squares models with the cointegration models. Moreover, recent empirical studies have indicated that the ARDL approach to cointegration is more preferable to other conventional cointegration methods such as Engle and Granger (1987) and Johansen and Juselius (1990).

Chaiboonsri *et al.* (2010) attempted to model the tourism demand in context of Thailand using quarterly tourism data over the period 1997 (Q1) and 2005 (Q2). They specifically aimed at investigating the short-run as well as the long-run relationships between tourist arrivals in Thailand and some economic variables that were considered to be determinants of tourism demand in that country. Both the Johansen test for cointegration and the Engle-Granger error-correction model approach were used to draw conclusions on the association between the variables in the study. The findings revealed that in the long run, the growth of Thailand positively influenced its tourist arrivals while transportation costs and exchange rate negatively affected tourism in Thailand.

Tourism demand in Georgia was modeled by Dilanchiev (2012) using relevant data from 33 countries that were potential suppliers of tourists in the country. The data was obtained from Georgian National Tourism Administration Report from the year 2000 to 2011. He used Modified Gravity Model and Ordinary Least Squares (OLS) analysis based on pooled cross-sectional time-series to analyse the relationship between tourist arrivals and key economic factors such as per capita GDP, price level, population, travel distance, inflation, and some dummy variables. The results revealed a positive correlation between tourist arrivals in Georgia and its per capita GDP, population and CPI of tourist origin nation. However, travel distance, exchange rate and CPI of Georgia were found to be negatively correlated with tourist arrivals in the country.

Habibi and Abbasianejad (2011) aimed to shed light on European tourism demand in the context of Malaysia. They employed annual data of tourist arrivals and its determinants from 19 European countries that have been contributing to Malaysia's tourism sector over the period of 1998 to 2007. Dynamic panel data estimation techniques were hired to infer the possible channels through which tourism demand in Malaysia is determined. As per the findings, income, accommodation capacity, political stability and word-of-mouth were the main contributors to tourist arrivals in Malaysia. In contrast, the cost of living in Malaysia during a visit was found to be a negative determinant of tourism demand in the country.

In an attempt to model and forecast international tourism demand in ASEAN countries, Asrin *et al.* (2015) applied generalized Poisson regression model to identify the long-run determinants of international tourism demand. Moreover, conventional panel cointegration tests were also applied to understand the long run association between the variables considered. Annual data from 1995 to 2013 in context of Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam was considered in the study. In conclusion, they asserted that inflation and real exchange rate in respective countries generated adverse impacts of their international tourist inflows. On the other hand, greater trade openness and foreign direct investment inflows were found to exert positive impacts on international tourism in all six ASEAN nations.

Tourism accounts for the lion's share in Fiji's overall foreign exchange earnings and employment. Hence, Katafono and Gounder (2004) examined the determinants of tourism demand in Fiji using time series cointegration and Parsimonious error-correction approaches. They used a log-log model in which tourist arrivals in Fiji was expressed as a function of GDP of major trading partners of Fiji, the real effective exchange rate, and two dummy variables to proxy for the effects of military coups and cyclones in the country. Annual data of the considered variables ranged from 1970 t0 2002. The results revealed that the national income levels of the trading partners exhibited a positive relationship with the number of tourist arrivals in Fiji which is in line with economic theory. However, in contradiction to economic reasoning, the relative cost of living in Fiji also displayed a positive association with its tourism demand. As expected, military coups and cyclones were found to have adverse impacts on tourism generation in the country.

Hor (2015) modeled international tourism demand in the context of Cambodia incorporating annual data from 1994 up to 2013. The study involved an Autoregressive Distributed Lag (ARDL) model that was used to get accustomed to the dynamic determinants of both short and long run tourism demand in Cambodia by 12 countries. A log-log model was regressed in which tourist arrivals form each touring nation were expressed as functions of the real determinants of tourism demand in Cambodia. The results revealed that population growth rates in Thailand and Australia generated positive and negative effects on tourism in Cambodia respectively. In addition, the unemployment rates in Australia and Canada were found to be positively correlated to Cambodian number of tourist arrivals which was opposite to the findings associated with the unemployment rate-tourism demand nexus between USA and Cambodia. Moreover, the real GDP of Canada and Australia were also seen to be positively influencing tourism in Cambodia.

In a study by Asemota and Bala (2012) tourism demand in Japan was modeled using cointegration and error-correction model. They used annual time series data from 1962 to 2009 involving Japan and five Western countries from which tourists travelled to Japan during the period of study. Augmented Dickey-Fuller (ADF), Johansen cointegration and error-correction model techniques were specifically employed to interpret the short run and long-run determinants of tourism demand in Japan. Results following the cointegration tests depicted that there were long run associations between tourist arrivals in Japan and the explanatory variables. Moreover, the income levels in the tourist origin countries were found to have exerted positive trends in the number of tourists arriving in Japan, of which the U.S.A. and Canada in the long run were amongst the top two nations contributing to Japan's tourism.

Lelwala and Gunaratne (2008) used an error-correction modeling technique to build a framework for expressing the demand for tourism in Sri Lanka from the United Kingdom (UK). A multivariate log-log empirical model was used in the study incorporating relevant quarterly data from 1978 (Q1) to 2007 (Q4). In line with the findings, only in the long run, the national income of the UK and the exchange rate were perceived to be positively related to the volume of tourism in Sri Lanka while the relative cost of living in Sri Lanka, as expected, was found to have negative impacts on the country's tourist arrivals figure. A surprising result indicated that the Tsunami in Sri Lanka actually portrayed a positive relationship with tourists arriving from the UK while terrorism in Sri Lanka was found to be statistically insignificant in explaining tourism demand.

Keeping the utmost importance of tourism development in the underdeveloped nations into consideration, Muchapondwa and Pimhidzai (2008) endeavored to model the international tourism demand for Zimbabwe. They used the ARDL approach using appropriate data from 1998 to 2005. In addition, the Bounds tests for cointegration were also applied to detect the possible long-run relationships between the explanatory variables and tourist arrivals in Zimbabwe. According to their tests' results, taste formation, airfares, changes in global income levels and certain international events in Zimbabwe had positive impacts on the nation's tourism figures which implies for rapid development of its tourism infrastructure.

4. MODEL SPECIFICATION, DATA SPECIFICATION AND ECONOMETRIC METHODOLOGY

4.1. The Empirical Model

This paper extends the Lim (1997) model as the basis for specifying the international tourism demand model for Bangladesh using annual data from 1980 to 2017.

$$VISITS = f(RP_1, RP_2, T, INC, ER, DUM_1, DUM_2)$$

The number of international tourist arrivals (a variable named VISITS) is adopted as a proxy for international tourism demand for Bangladesh. The data on international tourist arrivals has been obtained from the Bangladesh Tourism Board websites.

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The domestic tourism price or the relative cost of living in Bangladesh (a variable named RP1) is proxied by the ratio of the Bangladeshi CPI to the United States CPI. The latter is used to represent the world's cost of living, as Bangladesh attracts tourists from all over the world. Data on both the Bangladeshi and the United States CPI were obtained from the International Financial Statistics (IFS) database (International Monetary Fund, 2015). India is regarded as the closest alternative international tourism destination to Bangladesh. As with domestic tourism prices, the prices of tourist goods in alternative destinations or the relative cost of living in India (a variable named RP2) was proxied by the ratio of the Indian CPI to the United States CPI. Data on the Indian CPI were obtained from the IFS database (IMF, 2015).

The Annual average of world oil prices was used to proxy transport costs (a variable named T). The data were obtained from the United States Energy Department. The United States income (a variable named INCOME) would be a good proxy for international tourist income as the trends in global income tend to follow the United States economic activity.

The exchange rate between the Bangladeshi Taka and the United States dollar (a variable named EXR) proxies the exchange rate between Bangladesh and the world. The data were obtained from the IFS database (IMF, 2015). A dummy variable each was used for the 2001 terror attack in the United States (a variable named DUM_1) and the 2007 political crisis in Bangladesh (a variable named DUM_2). Two different treatments of the two dummy variables are used to capture their possible temporary and permanent effects on international tourism demand. Descriptive statistics of the entire data set is given in Table 1 (see Appendix).

4.2. Econometric Methodologies

4.2.1. Testing the variables for Unit Root

There are several ways of testing for the presence of a unit root. However, the popular test for unit roots is Augmented Dickey-Fuller (ADF) tests. The ADF test is run based on equation (i) which is a modification of the DF test and involves augmenting the DF equation by lagged values of the dependent variable, and hence ensuring that the error process is residually uncorrelated. It also captures the possibility that the dependent variable is characterized by a higher order autoregressive process.

$$\Delta Y_t = \alpha + (\beta - 1) Y_{t-1} + \delta \Delta Y_{t-1} + \Psi T + e_t \tag{i}$$

In case of the ADF test the following testing procedure has been performed:

H_0: $\beta-1=0$ [i.e. the Y_t is non-stationary]

H_1: $\beta-1 \neq 0$ [i.e. the Y_t is stationary]

If the observed data exhibits an increasing or decreasing trend, it is very crucial to include the time trend in the unit root test procedure. Here it is mentionable that unit root tests have a non-standard and non-normal asymptotic distribution which are highly affected by the inclusion of deterministic terms, e.g., constant, time trend, etc. A time trend is considered an extraneous regressor whose inclusion reduces the power of the test. However, if the true data generating process were trend stationary, failing to include a time trend also results in a reduction in power of the test. In addition, this loss of power from excluding a time trend when it should be present is more severe than the reduction in power associated with including a time trend when it is extraneous.

We cannot rely upon the usual t-statistic since Yt can be non-stationary; rather we need to use specially tabulated McKinnon τ (tau) statistics values. If the computed value of τ is absolutely greater than the critical DF value, we may reject the null hypothesis of non stationarity, with α level of significance and accept the alternative hypothesis of stationarity. Otherwise we do not. One of the most important issues in conducting the unit root test is to select the appropriate lag length. One approach is to include a relatively long lag length and select the model by the usual t-test. If the t-statistics on lag p is insignificant at some specified critical value, the regression should be repeatedly estimated using a lag length p-1 until the lag is significantly different from zero. Microfit 4.1 software automatically selects the most significant lag length based on this criterion.

4.2.2. The ARDL Approach of Cointegration

Pesaran *et al.* (1996) and Pesaran and Shin (1998) introduces the ARDL approach of cointegration which is becoming very popular now a days in the field of econometric analysis. Recently, the ARDL approach to cointegration has been more preferable to other conventional cointegration approaches such as Engle and Granger (1987) and Johansen and Juselius (1990). The main advantage of this procedure is that it can be applied irrespective of whether the variables are I(0) or I(1) and this avoids the pre-testing problems associated with standard cointegration analysis which requires the classification of the variables into I(1) and I(0). In addition the ARDL approach also gives more robust results when the sample size is small. Thus the ARDL approach of cointegration avoids the use of ADF unit root tests and autocorrelation function tests for testing the order of integration. However, some researchers state that, the ARDL procedure will crash in the presence of I(2) series. According to Ouattara (2004) the implementation of unit root tests in the ARDL procedure might still be necessary in order to ensure that none of the variable is integrated of order 2 or beyond. Moreover, a dynamic Error Correction Model (ECM) can be derived from ARDL which integrates the short-run dynamics with the long-run stability without losing the long-run information.

The ARDL procedure involves two stages. At the first stage, the long run relationship between the variables under investigation is tested by computing the F-statistics for testing the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model (Pesaran and Pesaran, 1997). They have tabulated two sets of values for different number of regressors (k) and whether the ARDL model contains an intercept and/or trend. One set assumes that all the variables in the ARDL model are I(1), whereas another assumes all the variables are I(0).

If the computed F-statistics falls above the upper critical value, the null hypothesis of no long-run relationship can be rejected without needing to know the orders of integration for the time series. Conversely, if the computed F value is below the lower critical value, the null hypothesis cannot be rejected. Finally, if the computed statistics falls within the critical value band, the result is inconclusive.

The second step of the ARDL procedure is to estimate the long run and the short run coefficients and their inferences provided that the long run relationship between the variables is already established.
The ARDL framework takes the following form:

$$\Delta Y_t = \beta_0 + \Sigma \beta_1 \Delta Y_{t-l} + \Sigma \beta_2 \Delta X_{t-l} + \beta_3 Y_{t-l} + \beta_4 X_{t-l} + \varepsilon_t \qquad (ii)$$

4.2.3. Engle-Granger ARDL Causality Tests

According to cointegration analysis, when two variables are cointegrated then there is at least one direction of causality. Some recent research has indicated that the existence of non-stationary series data can give misleading conclusions in the Granger causality test. It is only possible to infer a causal long run relationship between non stationary time series when the variables are cointegrated (Engle and Granger, 1987). Granger has explained that for cointegrated time series, it is very important to include the error correction term in the tests. Otherwise, the standard Granger test may provide invalid causal information. In addition, the inclusion of the error correction term helps us to distinguish between short run and long run causality. The lagged change in the independent variables represent the short run causal impact whilst the significance of the error correction term gives the information on long-run causality (Razzaque and Ahmed, 2000). The standard Granger causality follows the F-test whereas the causality test with error correction term follows the t-test.

If Y and X are the variables of interest, then the Granger causality test determines whether past values of Y add to the explanation of current values of X as provided by information in past values of X itself. If past changes in Y does not help explain current changes in X, then Y does not Granger cause X. Similarly, we can investigate whether X Granger causes Y by interchanging them and repeating the process. There are four likely outcomes in

the Granger causality test: (1) neither variable Granger cause each other, (2) Y causes X but not otherwise, (3) X causes Y but not otherwise, (4) both X and Y Granger cause each other.

5. RESULTS

To begin with, the ADF test to check whether or not the variables are stationary in order to avoid a spurious regression. The results from the ADF tests are summarized in Table 2. From this table, it can be seen that all the variables are stationary at their levels, I(0). However, they all become stationary at their first differences, I(1). Thus, the problem of the regression analysis being a spurious one is avoided.

Table-2. Augmented Dickey-Fuller Unit Root Test

Panel 1: Levels I(0)			
Variables	**ADF Statistics (Only Constant)**	**ADF Statistics (Constant & Trend)**	**Decision**
TA	-3.0039	-2.5050	Non-Stationary
RP1	-0.9744	-2.5870	Non Stationary
RP2	-0.2052	-2.0251	Non-Stationary
TC	-0.1134	-2.0378	Non-Stationary
INC	-2.7823	-0.7629	Non-Stationary
ER	-2.2515	-1.7908	Non-Stationary
Panel 2: First Differences I(1)			
Variables	**ADF Statistics (Only Constant)**	**ADF Statistics (Constant & Trend)**	**Decision**
TA	-5.5692	-5.7507	Stationary
RP1	-2.7732	-2.6158	Stationary
RP2	-3.5339	-3.4795	Stationary
TC	-4.4785	-5.0811	Stationary
INC	-2.5011	-4.4091	Stationary
ER	-4.5816	-4.7205	Stationary
Table: Mackinnon Critical Values for Rejection of Hypothesis of a Unit Root			
Level of Significance	**Levels**		**First Differences**	
	No Trend	**With Trend**	**No Trend**	**With Trend**
1%	-3.5547	-4.1348	-4.1383	-3.5572
5%	**-2.9157**	**-3.4935**	**-3.4952**	**-2.9167**
10%	-2.5953	-3.1753	-3.1762	-2.5958

Source: Authors' own

The unit root tests are followed by the ARDL approach to cointegration analysis. Firstly, the order of lags on the first-differenced variables was obtained from the unrestricted VAR model by means of AIC. In this paper, based on the Akaike Information Criteria (AIC) value, lag 2 is taken as an optimal level because of using annual data. The cointegration results are summarized in Table 3.

Table-3. ARDL Cointegration Test(F Test)

Order of Lags	F Statistics without Trend (p-value)	F Statistics with Trend (p-value)
2	F(6,13)=3.9056	F(6,12)=3.7768
Critical Values		
10% Significance Level	**Without Trend**	**With Trend**
	Lower Bound 2.141 Upper Bound 3.251	Lower Bound 2.587 Upper Bound 3.646

Source: Authors' own

This table above shows that, the computed F statistics (without trend) in lag 2 is 3.9056 which is higher than the lower and upper bound critical values of 2.141 and 3.251 at the 10% significance level making it significant. Moreover, when trend is considered, the computed F statistics in the same lag length is 3.7768 which is also

significant at 10% significance level due to being over the lower bound (2.587) and upper bound (3.646) critical values. All these results appear to indicate that null hypothesis of no cointegration is rejected and provide evidence for the existence of a long run relationship between the variables. This allows us to proceed in the second stage of the ARDL model which is the estimation of the slope coefficients. The signs and the values of the long run coefficients are given in Table 4.

Table-4. Estimated long run coefficients result using ARDL(1,1,0,0,0) based on AIC

Dependent Variable: TA					
The Long Run Coefficients Result ARDL(1,1,0,0,0)					
Without Trend			With Trend		
Regressors	Coefficient	T-Ratio	Regressors	Coefficient	T-Ratio
RP1	–53702.9	–0.587 (0.563)	RP1	–100047.2	0.946 (0.355)
RP2	63303.9	0.448 (0.659)	RP2	94751.3	0.629 (0.536)
TC	–920.6	–2.20 (0.039)	TC	–268.14	–0.309 (0.761)
INC	7.271	0.477 (0.638)	INC	13.16	0.455 (0.654)
ER	5799.5	1.853 (0.077)	ER	5653.8	1.778 (0.090)
DUM1	6105.1	0.235 (0.817)	DUM1	7117.6	0.269 (0.791)
DUM2	456150.0	5.407 (0.000)	DUM2	454927.0	5.305 (0.000)
INT	–80066.0	–0.613 (0.0546)	INT	–28250.5	–0.198 (0.845)

Source: Authors' own
Note: Here lag 4 is considered because Trend is significant only in lag 4 and it is also used to check ARDL cointegration test; The probability values are provided within the parentheses.

According to the signs of the estimated slope coefficients, it is found that RP1 and TC, as expected, negatively affect tourism demand in Bangladesh which is in line with economic theories. Moreover, evidence suggesting the positive influences of RP2, INC, ER, DUM1 and DUM2 on tourism demand are also established.

After estimation of the long run coefficients, the error correction representation of the ARDL model are obtained. The estimations of the ECM are provided in Table 5.

Table-5. Estimated Error Correction Model in ARDL(3,1)

ECM-ARDL: Dependent Variable dTA		
Regressors	Coefficient	T-Ratio (P-Value)
dRP1	–37068.3	–0.574 (0.571)
dRP2	–342134.6	–1.965 (0.061)
dTC	–635.45	–2.035 (0.053)
dINC	5.0207	0.461 (0.649)
dER	–3224.5	–1.333 (0.195)
DUM1	4214.0	0.234 (0.817)
DUM2	64885.4	2.852 (0.009)
dINT	–55265.3	–0.634 (0.532)
ECM(–1)	**–0.6903**	**–9.011 (0.000)**

Source: Authors' own

The ECM coefficient shows how slowly/quickly variable return to equilibrium and it should be negative, less than 1 and highly significant, which is the case here. According to Banerjee *et al.* (1998) a highly significant error correction term is further proof of the existence of a stable long-term relationship. The estimated coefficient of the ECM (−1) is equal to - 0.6903, suggesting that deviation from the long-term path is corrected by almost 69 percent in the following year.

5.1. Engle-Granger ARDL Causality Test Results

The Engle-Granger causality tests are done to detect both short run and long run causalities between the variables in order to understand how changes in the regressor affect movements in the real exchange rate. The results of the relationship between real exchange rate and its fundamentals are reported in Table 6.

Table-6. Granger Causality Test Results

Causality Test Statistics between TA and RP1			
Dependent Variable: dTA			
Null: RP1 does not cause TA			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	4477.1	0.286	0.777
dRP1	-20909.1	-0.070	0.945
dTA(-1)	0.2098	1.038	0.308
RES(-1)	-0.3789	-2.295	0.029
Dependent Variable: dRP1			
Null: TA does not cause RP1			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	0.0156	1.854	0.074
dTA	0.0000321	0.322	0.750
dRP1(-1)	0.599	3.868	0.001
RES(-1)	0.001170	1.450	0.158
Causality Test Statistics between TA and RP2			
Dependent Variable: dTA			
Null: RP2 does not cause TA			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	24885.3	1.877	0.071
dRP2	-680546.9	-2.104	0.044
dTA(-1)	0.13131	0.732	0.470
RES(-1)	-0.3406	-2.328	0.027
Dependent Variable: dRP2			
Null: TA does not cause RP2			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	0.0112	2.045	0.050
dTA	-0.0000095	-1.322	0.196
dRP2(-1)	0.673	4.928	0.000
RES(-1)	0.0000064	1.079	0.289
Causality Test Statistics between TA and TC			
Dependent Variable: dTA			
Null: TC does not cause TA			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	-5217.9	-0.824	0.416
dTC	4508.1	6.461	0.000
dTA(-1)	0.623	4.480	0.000
RES(-1)	-0.413	-4.287	0.000
Dependent Variable: dTC			
Null: TA does not cause TC			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	1.976	1.300	0.204
dTA	0.001	3.932	0.000
dTC(-1)	-0.288	-1.963	0.059
RES(-1)	0.0003	1.244	0.223
Causality Test Statistics between TA and INC			
Dependent Variable: dTA			
Null: INC does not cause TA			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	-16369.6	-0.701	0.488
dINC	46.619	0.948	0.351
dTA(-1)	0.343	1.750	0.091
RES(-1)	-0.479	-2.682	0.012
Dependent Variable: dINC			
Null: TA does not cause INC			
Regressor	**Coefficient**	**T-Ratio**	**P-Value**
INT	254.53	3.339	0.002
dTA	-0.332	-0.495	0.624

dINC(-1)	0.436	2.627	0.014
RES(-1)	-0.oo1	-2.377	0.024
Causality Test Statistics between TA and ER			
Dependent Variable: DTA			
Null: ER does not cause TA			
Regressor	Coefficient	T-Ratio	P-Value
INT	2306.0	0.323	0.749
dER	-4799.2	-1.3605	0.184
dTA(-1)	0.315	2.285	0.030
RES(-1)	-0.812	-5.740	0.000
Dependent Variable: dER			
Null: TA does not cause ER			
Regressor	Coefficient	T-Ratio	P-Value
INT	0.157	0.436	0.666
dTA	-0.00006	0.738	0.466
dER(-1)	0.314	1.456	0.156
RES(-1)	-0.00003	-0.241	0.812

Source: Authors' own

According to the finding, it can be seen those unidirectional causalities running respectively from RP1 and ER to TA only in the long run. Moreover, a unidirectional causality is witnessed to be running from RP2 to TA in both the short run as well as the long run. The causality test results between TC and TA suggest a long run unidirectional causality running from TC to TA while bidirectional causality between these variables was also found to be running in the short run. Finally, a bidirectional causality running from INC to TA was found in the long run only.

6. CONCLUSIONS

Bangladesh is blessed with a vast array of picturesque natural endowments which makes it a diverse and adventurous tourist destination that has a lot of attractions in store for both local and international tourists. Thus, accurate estimation of its tourism demand is crucial from the broader perspective of its socio-economic development. Estimating tourism demand precisely would not only lead to the development of the tourism sector alone, but it would also complement the development of other sectors as well improving Bangladesh's overall macroeconomic indicators. According to the findings, most of the variables considered work in favor of boosting the tourist arrivals figures for Bangladesh which has numerous policy implications. For instance, controlling domestic inflationary rate could be a potential tool for tourism development in Bangladesh following the negative relationship between the relative cost of living in Bangladesh and its tourist arrivals. Moreover, the central bank should ideally maintain its tight grip over the domestic exchange rate to avoid any kind of exchange rate appreciation that not only would reduce the volume of international tourism but would also exert adverse implications on the economy as a whole.

The government should put forward strong strides in eradicating the barriers upholding tourism development in the country. The Bangladesh Parjatan Corporation should take initiatives to promote its potential tourist spots among both foreign and local people. With the increasing use of social media, advertisement and promotional activities have become easier, cheaper and far more effective. Hence the organization should promote Bangladeshi tourist locations through these social media and make the best use of the resources available for promotional activities. Tourism infrastructure development is another issue that should be addressed with immediate effect. As part of the infrastructural development policies, the government should allow both the public and the private sectors to invest funds necessary for building an improved and sustainable tourism infrastructure which would ideally attract tourists. Moreover, security of tourists is also an issue which needs to be taken care off. The law enforcing agencies are responsible for ensuring the security of its citizens as well as that of foreigners within the

country's borders. Hence the government should ensure that the law enforcing agencies are carrying out their responsibilities properly.

Insufficient availability of data was the main limitation of this study which acted as a constraint restraining the number of explanatory variables. Data covering crucial tourism-determining factors like political stability and tourist safety attributed to the omission of these variables from the model considered in this paper.

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APPENDIX

Table-1. Descriptive Statistics of the Dataset

Descriptive Statistics	TA	RP1	RP2	TC	INC	ER	DUM1	DUM2
Mean	162936.0	1.125445	0.620375	40.43400	9.28E+12	41.59194	0.028571	0.028571
Median	148349.0	1.030377	0.596862	26.64000	8.61E+12	41.40300	0.000000	0.000000
Maximum	467300.0	1.959089	1.296439	99.67000	1.74E+13	52.14200	1.000000	1.000000
Minimum	49315.00	0.545288	0.266317	14.42000	2.86E+12	28.34100	0.000000	0.000000
Std. Dev.	78950.27	0.383808	0.284341	28.30301	4.50E+12	5.671713	0.169031	0.169031
Skewness	1.704392	0.660605	0.693882	1.083396	0.253565	0.002585	5.659453	5.659453
Kurtosis	7.524796	2.748087	2.699607	2.621663	1.740187	2.593844	33.02941	33.02941
Jarque-Bera	46.80315	2.638204	2.940182	7.055601	2.689615	0.240610	1501.913	1501.913
Probability	0.000000	0.267375	0.229905	0.029369	0.260590	0.886650	0.000000	0.000000
Sum	5702760.	39.39056	21.71312	1415.190	3.25E+14	1455.718	1.000000	1.000000
Sum Sq. Dev.	2.12E+11	5.008500	2.748902	27236.05	6.87E+26	1093.723	0.971429	0.971429

Source: Authors' own