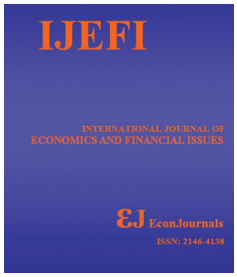

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Tourism Development and Economic Growth in Bangladesh: New Evidence from Nonlinear Autoregressive Distributed Lag

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ABSTRACT

We examine the long-run relationship between tourism development and economic growth using the Nonlinear Autoregressive Distributed Lag (NARDL) model for Bangladesh using annual data from 1980 to 2016. We find an asymmetric relationship between tourism and Bangladesh's economy since a 1% increase in tourism receipt increases economic growth by about 0.19%. On the contrary, due to a 1% decline in the tourism receipt, economic growth will decrease by about 0.66%. So, the decline in tourism receipt will have a higher negative impact on economic growth than the increase in the tourism receipt in Bangladesh, which result is important for current pandemic situation in tourism due to Covid-19. We also reveal that the impact of positive change in the tourism revenue on GDP stabilizes around 8 years; however, an adverse change on GDP does not stabilize in 15 years. We recommend that a systematic allocation of resources is required to promote and stimulate the tourism industry in Bangladesh for a favourable impact on the country's long-run economic development.

Keywords: Tourism Development, Economic Growth, Nonlinear Autoregressive Distributed Lag, Bangladesh, Asymmetry
JEL Classifications: C32, O50, Z32

1. INTRODUCTION

Economic growth mainly depends on the contribution of different factors and numerous empirical growth literatures attempt to explain economic growth based on multiple factors, such as technology, innovative and intellectual capital, human capital, export, fiscal policy, monetary policy, financial factors and role of institutions (Balassa, 1978; McKinnon, 1973; North, 1991; Peacock and Wiseman, 1961; Robert, 1988; Romer, 1986; Solow, 1956; Tobin, 1965). Tourism revenue is considered an instrument for export diversification and contributes to the balance of payments, increased employment opportunities, and government revenues (Archer, 1995; Durbarry, 2002). Tourism receipt can promote a country's economic growth through spillovers and other externalities (Marin, 1992). Tourism development also provides foreign revenue and fosters investment in infrastructural and socio-economic development, which also generates new employment (Blake et al., 2006). The tourism sector's significance can also be recognized from the statistics of the World Travel and Tourism Council (WTTC). In 2019, the contribution of tourism was 8.9 trillion USD globally (10.3% of total global GDP) and created around 300 million jobs around the world. In the South Asian region, tourism has contributed 234 billion USD (6.6% of the region's total GDP).

In Bangladesh, over the last twenty years, RMG (readymade garments) exports and remittances are the principal sources of growth. Majority of the export earnings are concentrated only on the RMG sector and undiversified export of the RMG sector, both in terms of product range and market, will increase the likelihood of vulnerability to different shocks (Raihan and Bourguignon, 2020). A scenario of the tourism sector in Bangladesh is reflected in some recent stylized facts highlighted in the WTTC. Tourism's total contribution to GDP was 3% of

total GDP in 2019. In 2019, tourism's total share of employment was 2.9% of total employment. The tourism sector generates 28.3 billion Taka, which is 0.7% of total exports in 2019. Thus, the tourism sector can also be seen as a promising alternative for export diversification, government revenue, and maintaining a healthy fiscal balance in Bangladesh.

The economic impact of tourism has been broadly studied in numerous works of literature. It is revealed from the existing pieces of literature that a positive impact of tourism on the growth of an economy can be conveyed through different possible channels. A vast number of empirical pieces of literature focus on the symmetric time-series models to examine tourism-growth nexus (Brida et al., 2016). In their pioneering work, Balaguer and Cantavella-Jorda (2002) have explored the possible link between tourism and the economy in Spain and found a long-run association between them. Oh (2005) has examined the tourism-growth nexus in Korea and found no evidence of a long-run relationship. For the Taiwanese economy, Kim et al. (2006) have explored the association between tourism and growth and found the evidence of a long-run association between the variables. Brida et al. (2008) have found the evidence of tourism led growth hypothesis in Colombia. Hye et al. (2013), Tang and Abosedra (2014), Aslan (2016), Ohlan (2017), Yazdi (2019) and Ribeirio and Wang (2020) have also found the shreds of evidence of tourism-growth nexus in Pakistan, Lebanon, Turkey, India, Iran and Sao Tome and Principe (STP) respectively. Some studies have used panel data models to examine tourism-growth nexus. Proenca and Soukiazis (2008) tested the tourism-growth nexus for the four European countries (Greece, Italy, Portugal, and Spain) and found the significant contribution of tourism on economic growth. Saleh et al. (2015) checked the existence of the nexus for Bahrain, Jordan, and Saudi Arabia and found the validity of the linkage between tourism and growth.

Few studies have also been employed nonlinear techniques to examine the tourism-growth nexus. Brida et al. (2015) have used nonlinear techniques to examine tourism led growth hypothesis. The study has found evidence of a sustainable relationship between the variables for Argentina, Brazil, Paraguay, and Uruguay. In Jordan, Muhtaseb and Daoud (2017) have employed both linear and nonlinear cointegration techniques and found a positive long-run relationship between tourism and economic growth. This study's nonlinear technique has provided a more robust and accurate result to capture any shock and disturbances on the economy. In Thailand, Fareed et al. (2018) have used nonlinear autoregressive distributed lag (NARDL) model to explore the asymmetric association between tourism and growth. The study has found the presence of sustainable asymmetric linkage between the variables. In a recent study, Kumar et al. (2020) have used the NARDL model to explore the possible long-run asymmetric linkage between tourism and economic development in the Cook Islands. The study has found that an addition to the tourist arrival would have a greater positive impact on growth than the negative effect due to a decrease in tourist arrival. Husein and Kara (2020) have utilized the same technique to examine the asymmetric impact of change in the United States income (real per capita GDP) on tourism demand for Puerto Rico. The study has revealed a nonlinear relationship in which any change in the U.S.'s income has distinct effects on Puerto Rico's tourism (For details see the table in the Appendix Table 1)

Due to the outbreak of COVID-19 in December 2019, the tourism sector has been badly affected around the world. Many countries have locked their borders, limited domestic and international travel, and maintained physical distancing initiatives. Every sub-sector related to tourism, such as transport, hotels, and travel agencies, is affected due to this crisis. The World Travel and Tourism Council (WTTC) (2020) has estimated that about 100 million jobs are in jeopardy, and the U.S. $2.7 trillion in revenue could be lost globally in 2020 due to the COVID-19 pandemic. Due to COVID-19, the estimated potential loss of the tourism sector in Bangladesh will be the U.S. $ 2.03 billion (Twining and McComb, 2020). It is noteworthy that previously conducted studies mainly focus on the symmetric models and not consider the probable asymmetric effects. Besides, the information transmitted by the linear models is inadequate to provide robust inference or precise forecasts (Shin et al., 2014). Any negative or positive shock in the variables cannot be captured adequately by the linear symmetric models. In this current pandemic situation, traditional linear models cannot grasp the adverse effect of tourism receipts on economic growth. To our knowledge, there is no prior empirical study that examines the tourism-economic growth nexus for the Bangladesh economy in a NARDL framework. Previously, Amin (2010) has examined this linkage between tourism expansion and economic growth in Bangladesh by using an autoregressive distributed lag (ARDL) framework and found a sustainable equilibrium association between the variables. Amin et al. (2019) have also explored the long-run association between tourism and government revenue in Bangladesh by utilizing a similar technique and have found a long-run linkage between the variables. This paper is the extension of the previous one, Amin (2010) by employing the NARDL framework.

To fill the gap, this paper has augmented the NARDL technique to examine the relationship between tourism development and economic growth in Bangladesh. Since the NARDL model has some advantages over the ARDL model[1] and can examine the relationship of the concerned variables in an asymmetric approach, this present study will give more precise directives to the policymakers compared to the linear model used in Amin (2010). The study finds that a 1% increase in the tourism receipt will increase economic growth by around 0.19%, while a 1% decrease will decrease the growth by about 0.66%.

The rest of the paper is structured as follows: Section 2 introduces the econometric models and methodology for explaining the analysis and the limitations of the study. Section 3 reports and interprets econometric findings; Section 4 focuses on the implication of the findings and ends the paper with some policy recommendations.

1 For details see Shin et al. (2014)

2. METHODS

Following Amin (2010), we have considered following model to addressing our questions in this paper,

$$gdp_t = \alpha_0 + \alpha_1 tour_t + \alpha_2 exc_t + \in_t \quad (1)$$

Where *gdp* is the GDP of Bangladesh, *tour* is the tourism receipt of Bangladesh and *exc* is the exchange rate of Bangladesh. All the variables are taken from 1980 to 2016, and they are converted into the natural logarithmic form to make this model into an elasticity model. This paper augmented Amin's paper by using the exchange rate to examine how inbound tourism depends on the exchange rate. This is because if the exchange rate is higher or depreciates, that will make a country's tourism cheaper than the competing countries (Ertugrul and Mangir, 2015; Husein and Kara, 2020).

The nonlinear ARDL model had some advantages over the ARDL model that is used in Amin (2010). The main drawback of this ARDL model was it assumes a symmetric relationship that means the rate at which GDP increases due to a rise in tourism is the same as the rate of GDP decreases due to tourism decrease. Similarly, like the ARDL model NARDL model is free from residual correlation and endogeneity of regressors. Also, the NARDL model exhibits long run and short run cointegration regardless of the variables I(0), I(1), or integrated at the same order. Unlike the ARDL model, the NARDL model discerns the asymmetric adjustment of the regressors' positive and negative shocks on the explained variable. That means this model can detect if there are any long run and short run asymmetry in the model.

Following, Shin et al. (2014), we will use nonlinear ARDL (p, q_1, q_2) model as follows,

$$gdp_t = \sum_{j=1}^{p} \phi_j gdp_{t-j} + \sum_{j=0}^{q_i} (\theta_j^+ tour_{t-j}^+ + \theta_j^- tour_{t-j}^-) + \sum_{j=0}^{q_2} (\eta_j^+ exc_{t-j}^+ + \eta_j^- exc_{t-j}^-) + \in_t \quad (2)$$

Here, θ_j^+, θ_j^-, η_j^+ and η_j^- are the associated asymmetric long-run parameters and ϵ_t is an *i.i.d.* a process with zero mean and finite variance. P, q_1 and q_{21} are lag orders and $tour_t \left(= tour_0 + tour_t^+ + tour_t^-\right)$ and $exc_t \left(= exc_0 + exc_t^+ + exc_t^-\right)$ are vectors with $k\times1$ dimension, entering the model asymmetrically. $tour_t^+$ and $tour_t^-$ denoting the partial sums of positive and negative changes in tourism revenue. Same is true for exc_t^+ and exc_t^-. This model of partial sum decomposition can be written in the following form,

$$tour_t^+ = \sum_{j=1}^{t} \Delta tour_j^+ = \sum_{j=1}^{t} \max\left(tour_j, 0\right) \quad (3)$$

$$tour_t^+ = \sum_{j=1}^{t} \Delta tour_j^- = \sum_{j=1}^{t} \min\left(tour_j, 0\right) \quad (4)$$

$$exc_t^- = \sum_{j=1}^{t} \Delta exc_j^+ = \sum_{j=1}^{t} \max\left(exc_j, 0\right) \quad (5)$$

$$exc_t^- = \sum_{j=1}^{t} \Delta exc_j^- = \sum_{j=1}^{t} \min\left(exc_j, 0\right) \quad (6)$$

Equation 2 can be formulized into a conditional nonlinear error correction model (ECM) in the following format,

$$\Delta gdp_t = \rho \xi_{t-1} + \sum_{j=1}^{(p-1)} \delta_j \Delta gdp_{t-j} + \sum_{j=0}^{q_1-1} \left(\pi_j^+ \Delta tour_{t-j}^+ + \pi_j^- \Delta tour_{t-j}^-\right) + \sum_{j=0}^{(q_2-1)} (\lambda^+ \Delta exc_{t-j}^+ + \lambda^- \Delta exc_{t-j}^-) + e_t \quad (7)$$

Where, $\rho = \sum_{j=1}^{p} (\phi_j - 1)$ and $\xi_t = gdp_t - \alpha^+ tour_t^+ - \alpha^- tour_t^- - \beta^+ exc_t^+ - \beta^- exc_t^-$ is the nonlinear error correction term where, $\alpha^+ = -\theta^+ / \rho$, $\alpha^- = -\theta^- / \rho$, $\beta^+ = -\eta^+ / \rho$ and $\beta^- = -\eta^- / \rho$. Also, $\sum_{j=0}^{(q_1-1)} \pi^+$ and $\sum_{j=0}^{(q_1-1)} \pi^-$ shows short run influences of increase and decrease of tourism revenue on GDP. Similarly, $\sum_{j=0}^{(q_2-1)} \lambda^+$ and $\sum_{j=0}^{(q_2-1)} \lambda^-$ shows, influences of increase and decrease of exchange rate on GDP.

Therefore equation 7 can be framed into nonlinear ARDL-based ECM in the following format.

$$\Delta gdp_t = c + \phi_j gdp_{t-j} + \theta_j^+ tour_{t-j}^+ + \theta_j^- tour_{t-j}^- + \eta_j^+ exc_{t-j}^+ + \eta_j^- exc_{t-j}^- + \sum_{j=1}^{p-1} \delta_j \Delta gdp_{t-j} + \sum_{j=0}^{q_1-1} \left(\pi_j^+ \Delta tour_{t-j}^+ + \pi_j^- \Delta tour_{t-j}^-\right) + \sum_{j=0}^{q_2-1} (\lambda^+ \Delta exc_{t-j}^+ + \lambda^- \Delta exc_{t-j}^-) + e_t \quad (8)$$

In equation 8*c* is the restricted constant. This is the case-2 of conditional error correction model (CECM) by Pesaran et al. (2001). The value of θ_j^+, θ_j^-, η_j^+ and η_j^- should be positive. As, the positive value of θ^+ shows, as tourism revenue increases, GDP would increase and positive value of θ^- show as tourism revenue decreases GDP would decrease too. This is what tourism led growth hypothesis or growth led tourism hypothesis suggests. Same way positive value of η^+ and η^- shows that if the exchange rate increases, that means exchange rate depreciates against the dollar, which makes tourism in Bangladesh cheaper, which in turn creates GDP to increase.

To see if there is any long-run relationship or cointegration among these variables we will first apply F-statistics from equation 8, where our null hypothesis is there is no cointegration

that is (H_0=ϕ=θ^+=θ^-=η=0). Then to make sure this cointegration is not nonsensical cointegration or degenerate cointegration normally t-bounds statistics of Banerjee et al. (1998) is used. However, in the data generating process (DGP) has a trend or a constant, then t-test can not be used. After that, we used the null hypothesis of $\phi = 0$ against the alternative hypothesis of $\phi < 0$. After that, we will use null hypothesis of long run symmetry of GDP using the Wald test, which uses a χ^2 distribution with null hypothesis that there is no difference between θ^+ and θ^- that is (H_0: θ^+=θ^-).

3. RESULTS

Even though it is not necessary for the variables to integrated at the same order for NARDL model, but if there is any variable which is *I*(2) then the model would be invalid. Therefore, we first checked the unit root test and found that there is no variable, which is integrated at *I* (2).

From Table 1 we see that value of F_{PSS} statistic is significant at 5% level. Therefore, it is definite that there is a cointegrating relationship among these variables. Also, from the table, χ^2_{SC} and χ^2_{HET} are the serial correlation test and heteroskedasticity test for the residuals, respectively. In the serial correlation test, the null hypothesis is there is no serial correlation in the residuals, and in the heteroskedasticity test, the null hypothesis is that residuals are homoskedastic. Both of these tests can not reject the null hypothesis, therefore, we can safely say that this model's residual is linear uncorrelated and homoskedastic. Lastly, we can see that Wald test statistics for tourism are significant at 1% level, which means there is a significant asymmetric relationship between GDP and tourism revenue. From the Figure 1, we can see that recursive estimation using CUSUM and CUSUM of the square is within the 5% significance level, and therefore, the coefficients of this model are stable over the study period.

Table 2 shows the coefficients of error correction model of equation 8. From there, we can find the Long run results of the NARDL model ($\alpha^+ = -\theta^+/\rho, \alpha^- = -\theta^-/\rho, \beta^+ = -\eta^+/\rho$ and $\beta^- = -\eta^-/\rho$). We can see these results in Table 3. We can see that when tourism revenue increases by 1%, GDP increases by 0.19%, and this is significant at a 5% level. As GDP increases by 1%, tourism increases by 1.52%.

Table 1: Long run cointegration and diagnostic testing

Cointegrating relationship and Diagnostics	
R^2	0.999402
$\overline{R^2}$	0.997939
χ^2_{SC}	0.034780 (0.8567)
χ^2_{HET}	0.510200 (0.9046)
F_{pss}	4.415527**
W^{tour}_{LR}	−3.098833***
W^{exc}_{LR}	2.247474**

***, **, * indicate significance level of 1%, 5% and 10% respectively

However, when tourism revenue decreases by 1%, GDP decreases at a higher rate of 0.66%, which is significant at the 10% level. Therefore, we can see there is an asymmetric relationship with tourism and GDP. This asymmetry is significant, as we have seen from W^{tour}_{LR} value from Table 1. Similarly, the value of the Wald test for exchange rate W^{exc}_{LR} from Table 1 shows the exchange rate has an asymmetric impact on GDP that is not the main focus of our study.

Next, we will see from the Figure 2, when tourism revenue increases impact fluctuation is low comparing when tourism revenue decreases. Also, we can see that the impact of positive change in the tourism revenue on GDP stabilizes around 8 years however, impact of negative change on GDP does not stabilize even in 15 years.

Table 2: Dynamic asymmetric error correction estimation of tourism revenue of Bangladesh

Conditional error correction regression			
Variable	**Coefficient**	**t-Statistic**	**Prob.**
c	10.4714	2.574944	0.0299
gdp_{t-1}	−0.426393	−2.448463	0.0368
$\Delta tour^+_{t-1}$	0.082484	2.103099	0.0648
$\Delta tour^-_{t-1}$	0.282483	3.622373	0.0056
exc^+_{t-1}	0.487034	2.127024	0.0623
exc^-_{t-1}	−34.26836	−2.224793	0.05531
Δgdp_{t-1}	0.041067	0.159183	0.877
Δgdp_{t-2}	−0.020154	−0.070691	0.9452
Δgdp_{t-3}	0.834729	2.850871	0.0191
$\Delta tour^+_t$	0.040652	0.766518	0.463
$\Delta tour^+_{t-1}$	−0.108111	−1.97123	0.0802
$\Delta tour^+_{t-2}$	−0.086627	−1.217427	0.2544
$\Delta tour^-_t$	0.109327	0.788497	0.4507
$\Delta tour^-_{t-1}$	0.21165	2.402216	0.0398
$\Delta tour^-_{t-2}$	−0.100963	−1.440455	0.1836
Δexc^+_t	−0.462223	−1.031885	0.3291
Δexc^+_{t-1}	−2.344229	−6.953494	0.0001
Δexc^+_{t-2}	−0.193125	−0.430001	0.6773
Δexc^+_{t-3}	−0.681001	−1.561104	0.1529
Δexc^-_t	−1.050932	−0.773509	0.4591
Δexc^-_{t-1}	35.41721	2.218881	0.0537
Δexc^-_{t-2}	32.88451	2.076075	0.0677
Δexc^-_{t-3}	35.18223	2.231123	0.0526

Table 3: NARDL long run results

Long Run Asymmetric Results			
Variable	**Coefficient**	**t-statistic**	**Prob.**
c	24.55811	35.57446	0.000
$tour^+$	0.193446	2.310727	0.0462
$tour^-$	0.662495	2.466897	0.0358
exc^+	1.142219	3.393412	0.008
exc^-	−80.36803	−3.053544	0.0137

Figure 1: (a) Cumulative sum (CUSUM) and (b) Cumulative sum square (CUSUM) of asymmetric ARDL

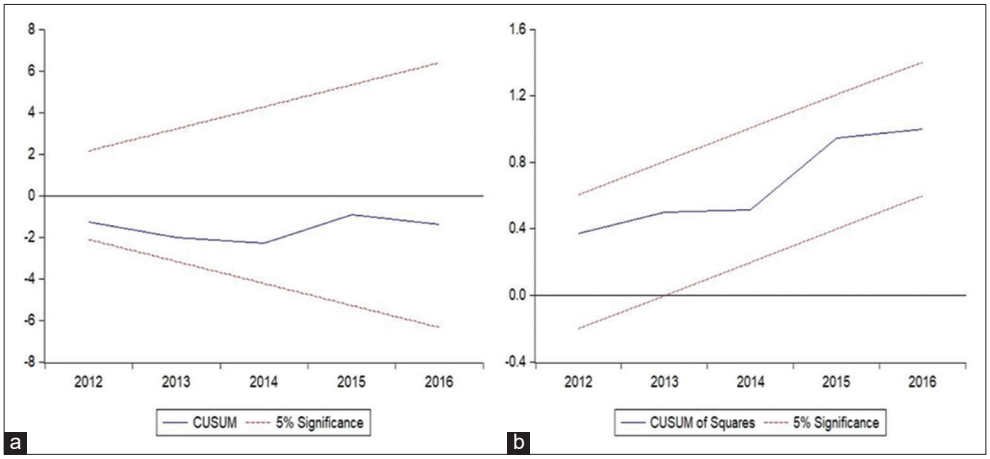
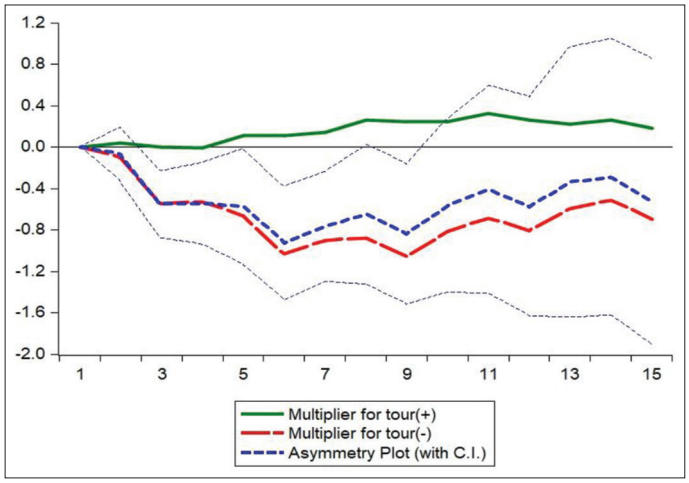


Figure 2: Bangladesh tourism revenue-GDP dynamic multiplier



4. CONCLUSION

This study has tested the connection between tourism development and economic growth in Bangladesh by employing the NARDL (nonlinear autoregressive distributed lag) framework. The research has shown that when tourism receipt increases by one%, economic growth will increase by about 0.19%. On the contrary, due to a one% decline in the tourism receipt, economic growth will decrease by about 0.66%. In addition, the study has also exposed that positive impact of tourism revenue on GDP stabilizes around eight years, whereas, the adverse change on GDP does not stabilize in fifteen years. So, the decline in tourism receipts will have a higher negative impact on economic growth than the increase in Bangladesh's tourism receipt.

Bangladesh is embellished with fascinating natural and historical tourist sites. The pandemic will have a devastating impact on Bangladesh's tourism sector, and a more substantial negative impact on growth from the findings of this study has suggested. So, policymakers should concentrate more on the tourism sector's barriers and provide adequate support for this sector's flourishment. Systematic allocation of resources is required to develop, stimulate, and tackle any shock in Bangladesh's tourism industry. During this pandemic, governmental initiatives may include tax relief and cash transfers to support enterprises' cash flow to continue their business. Also, expanding COVID-19 testing, improving COVID-19 screening in the border, ensuring safety, and creating safe travel zones for tourists will build confidence for domestic and foreign tourists. The World Tourism Organization (2020) has also suggested commencing initiatives to promote domestic tourism to withstand the tourism industry's shock during this pandemic. In Bangladesh, the industry suffers from a lack of trained people. Planned marketing and publicity needs to be carried out to attract foreign tourists from all over the world. Also, proper investment, both public and private, are required to develop transportation and communication systems. Another most critical factor is issues regarding security. Numerous beautiful tourist destinations in Bangladesh are left unexplored due to security reasons. Political turmoil is another thing that is holding the Bangladesh tourism industry from flourishing. The Government of Bangladesh should also ensure the safety of all tourists and implement sustainable policies on tourism. The findings from this study have some research prospects in the future. For instance, researchers could consider South Asian countries separately to examine the asymmetric effect of tourism on economic development. Future studies could also test the linkage between tourism and regional development within Bangladesh and other similar countries.

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APPENDIX

Table 1: Selected Studies Showing the relationship between tourism and economic growth

Authors Name and Year	Country and Data	Variables Used	Methodology	Results
Balaguer and Cantavella-Jordá (2002)	Spain (1975Q1-1997Q1)	Real Tourism Receipts, Real Economic Growth, Real Exchange Rate	Johansen Test, Granger Causality Test	1. Long-run relationship between T and Y. 2. T→Y
Oh (2005)	South Korea (1975Q1-2001Q1)	Real tourism receipts, real economic growth	Engle-Granger Test, Bivariate VAR, Granger Causality Test	1. No long run relationship between T and Y 2. Y→T
Kim et al.(2006)	Taiwan (1971Q1-2003Q2)	Tourist arrival, economic growth	Engle-Granger Test, Johansen Test, Granger Causality Test	1. Long-run relationship between T and Y. 2. T↔Y
Proença and Soukiazis (2008)	Four European countries (Greece, Italy, Portugal and Spain; 1990-2004)	Tourism receipts, real per capita income	Fixed effects and random effects model.	Cointegrating relationship between T and Y.
Brida et al.(2009)	Colombia (1987Q1-2007Q1)	Real per capita GDP, tourism expenditures and real exchange rates	Johansen test, the Granger Causality test	1. Long-run relationship between T and Y. 2. T→Y
Amin (2010)	Bangladesh (1973-2016)	Tourism receipt, GDP	Johansen test, ARDL bound test, Granger Causality	1. Cointegrating relationship between T and Y. 2. T→Y
Hye et al.(2013)	Pakistan (1971-2008)	Real tourism receipt, Real economic growth	Johansen test, ARDL method and rolling windows bounds testing approach	Cointegrating relationship between T and Y.
Brida et al.(2013)	Argentina, Brazil, Paraguay and Uruguay	Real GDP per capita, tourism expenditure	Non-parametric cointegration and causality test,	1. Cointegrating relationship between T and Y. 2. T→Y
Tang and Abosedra (2014)	Lebanon (1995-2010)	Tourism arrival, real GDP	ARDL method, The Granger causality	1. Long-run relationship between T and Y. 2. T→Y
Salleh et al.(2015)	Three Middle-East Countries (Bahrain, Jordan, and Saudi Arabia, 1981 to 2008)	Real tourist Receipt, Real Economic Growth	Panel Cointegration test	Cointegrating relationship between T and Y.
Aslan (2016)	Turkey (2003Q1-2012Q4)	Tourism expenditure, economic growth	ARDL bound test, Hatemi's causality test	1. Cointegrating relationship between T and Y. 2. T→Y
Muhtaseb and Daoud (2017)	Jordan (1998Q1-2015Q4)	Real GDP and Real international tourism receipts	Engle and Granger (1987), Enders and Siklos (2001) cointegration test, Diks and Panchenko (2006) causality test	1. Cointegrating relationship between T and Y. 2. T→Y (Linear Cointegration Approach) 3. T↔Y (Non-linear Cointegration Approach)
Ohlan (2017)	India (1960-2014)	GDP per capita, International Tourism Receipt Per Capita and Financial Development.	Bayer and Hanck Cointegration Test, ARDL bound Test, Granger Causality Test	1. Cointegrating relationship between T and Y. 2. T→Y
Fareed et al.(2018)	Thailand (1990-2017)	Number of Inbound Tourist, Total number of terrorist attack, GDP per capita	NARDL method	Long run asymmetric linkage between T andY.
Amin et al.(2019)	Bangladesh (1972-2016)	Tourism Receipts, Government Revenue	ARDL bound test, Granger Causality Test	1. Long-run relationship between T and Revenue. 2. T→Revenue
Yazdi (2019)	Iran (1981-2014)	International Tourism Receipt, physical and human capital consumption spending of households and real GDP per capita	ARDL bound test, Granger Causality	1. Long run asymmetric linkage between T andY. 2. T→Y

(*Contd...*)

Table 1: (*Continued*)

Authors Name and Year	Country and Data	Variables Used	Methodology	Results
Da Costa Ribeiro and Wang (2020).	Sao Tome and Principe (STP) (1997-2018)	Gross domestic product (GDP), tourism receipts (T.R.), real exchange rate (EX), and foreign direct investment (FDI).	Johansen test, the Granger Causality test	1. Cointegrating relationship between T and Y. 2.T→Y
Kumar et al.(2020)	Cook Islands (2010Q1-2016Q4)	Real GDP per capita, visitor arrivals per capita	NARDL method, Asymmetric causality	1. ↑T→larger positive effect on the Y. 2. T↔Y
Husein and Kara (2020)	Puerto Rico (1970-2016)	U.S. real GDP per capita, real tourism receipt and tourist price.	Nonlinear ARDL framework	Decrease in U.S.'s tourism income→Higher downward impact on Puerto Rico's tourism demand