The Moderating Role of Sustainable Factors on Tourism Development. A Dynamic Investigation for SIDS

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Abstract: Using panel data from selected Small Island Developing States (SIDS) for 1995–2019, the present study explored the moderating role of sustainable factors mainly economic, social and environment on tourism development. Through the use of a dynamic econometric model, namely the Panel Vector Error Correction Model (PVECM), the results show that high growth rates, better education level as well as better health care in the host countries contributes towards tourism development. However, environmental degradation is seen as a deterrent factor. Furthermore, the Dumitrescu Hurlin panel causality tests confirm the existence of a bi directional causal link between tourism development and economic growth. Similar results were obtained for the environmental factor and tourism development as well as the social indicator, education and tourism development. Hence, the study supports that both environmental preservation policies alongside policies to attract tourists to the host countries should be adopted in order to boost sustainable tourism development.

Keywords: *Tourism, Sustainability, SIDS, PVECM, Dumitrescu Hurlin panel causality tests.*

1. Introduction

SIDS have at least four common features mainly in terms of their small size, insularity/remoteness, environmental vulnerability and socio-economic factors [1-5]. Given their size, these islands normally have limited natural resources and are highly dependent on other countries for their supplies. Also having a small population size, they produce in small amounts and are unable to take advantage of economies of scale. They often face high transportation costs due to their remoteness [6]. Hence, most SIDS depend highly on their tourism sector to achieve development.

Tourism growth represents an important spillover effect for the host countries. For instance Sinclair [7] argued that tourism has the economic potential of creating jobs, generating revenue for the government and ultimately promoting growth. Tourist expenditure can be considered as an alternative form of exports, providing foreign exchange earnings for an economy. Such earnings are subsequently used for the importation of capital items to produce goods and services, which are crucial for economic growth in host countries [8]. The other positive spillovers generated are in terms of creating new business, employment and income, and boosting domestic

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consumption [9-11]. However, tourism development can also have harmful effects on host economies, like creating local vulnerabilities in terms of an increase in sewage, waste, and pollution and overcrowding. Therefore, it is noted that the tourism sector has important effects on the sustainability factors of the host countries, mainly the economic, social and environmental factors. There should be a suitable balance between these three dimensions in order to guarantee long-term sustainability. While tourism development contributes towards sustainable development of host countries, the reverse is as well possible [12].

The literature has proved the Tourism Led growth hypothesis supporting the fact that the tourism sector enhances growth while in some cases economic development also drives growth in the tourism sector [12-14]. Also, a better social environment can attract tourism, and the reverse is possible too. Finally, while tourism development does contribute to environmental degradation, it can also be argued that a poor environment negatively affects tourism flows [15].

An analysis of the literature shows that less attention has been diverted towards the linkages between the sustainable variables and tourism growth in one study. These relationships have been examined independently. Hence, the aim of this research is to empirically investigate the relationship between tourism and the three sustainable factors for a sample of SIDS. Methodologically, this study uses a rigorous dynamic time series analysis (for a sample of 20 island economies over the period 1995-2018) namely a panel vector error correction model (PVECM), which appropriately takes into account the time series properties of the data and also the dynamic nature of the tourism sustainable nexus. Also, the research brings fresh evidence from a relatively larger panel of island economies using a longer and more recent time series dimension. The rest of this paper is organized as follows: section 2 defines the methodological approach used; section 3 discusses the findings from the study

and finally, section 4 concludes.

2.0 Methodology

This study aims at investigating the relationship between tourism development and sustainable factors in selected Small Island Developing States over the period 1995 to 2019. The model adopted is grounded from the past relevant literature (see, Fauzel et al, [12] and Popescu et al, [16]. Basically a tourism demand model has been adopted and augmented with sustainability factors namely, economic, social and environmental.

$$TOU = f(GDP, CPI, SC, HEA, CO2)$$ -------------------Equation 1

Where Tou represents represents tourists' arrival. The economic indicators are GDP and CPI, representing real gross domestic product and inflation rate respectively. Secondary school enrolment rate (SC) and health care (proxied by death rate) are the two social factors included. Finally carbon emission proxied by CO_2 emissions (metric tons per capita) is included as the environmental factor.

Dependent Variable

Tourism development (TOU) is an ingredient for economic growth mainly for small island economies. Most of them depend heavily on this sector for their development. The number of tourist arrivals is used as a proxy for tourism expansion for the countries and such a measure has been widely used in the literature [17 [13] [18].

Independent Variables

The exogenous variables considered in the present study relate to sustainability factors which are mainly economic, social and ecological as discussed previously.

In terms of economic factors, real GDP and inflation rate have been included in the regression equation

(refer to equation 1). This variable relates to the level of economic development in the set of countries included in the study. Several scholars have supported the positive relationship between international tourism and economic growth for small island economies and thereby confirming the tourism led growth hypothesis [12-13] [19-20]. These studies also highlighted that tourists prefer to go to countries which are developed and have a high level of infrastructure.

Another economic variable included in the model is the rate of inflation proxied by the Consumer price index, CPI. High inflation is an important element affecting tourism demand and the tourism sector in developing countries. International tourism is highly vulnerable to changes internal (e.g. prices) and external (e.g. global economic trends) to the industry. The inflationary consequences of tourism can arise in several different ways. Retailers in tourist areas often raise their prices in the knowledge that they will continue to find a market among affluent tourists. Inflation in tourist destination areas is also caused by land values, with tourism generating additional demand for land [21].

Tourism development can have several positive influences in a host country like an inflow of capital which can be used to improve infrastructure, to provide better local facilities, better education, improved leisure facilities, more social events and better lifestyle for the local people [22]. Social factors can as well influence tourism [23]. Hence, in this study the secondary enrolment rate is included to capture the link between improvement in education and tourism development. Another social indicator used is the health factor proxied by death rate. Better medical facilities will improve the life of people and reduce the death rate.

The tourism sector is as well being affected by climate change and it remains a climate-sensitive industry. This is especially true for mountain and snow tourism, forest and biodiversity tourism, city and urban centre tourism and ocean and sea life tourism, all of which are heavily based on geographical location and physical characteristics [24]. For instance, adverse occurrences such as beach erosion, deterioration of coral reefs and damage to cultural heritage through floods as a result of increases in sea levels make small islands less attractive to tourists [25]. Regarding the environmental variable, the CO_2 emissions (metric tons per capita) is used as a proxy.

The natural logarithm of the variables have been used in order to reduce the problem of heteroskedascity. This technique also makes interpretation of the results easier and more meaningful. This result in the following:

$$lnTou_{it} = \beta_0 + \beta_1 \ln\ln GDP_{it}, \beta_3 lnCPI_{it}, \beta_3 lnSC_{it} + \beta_4 \ln HEA_{it} + \beta_5 \ln CO2_{it} + \varepsilon_{it}$$

---eq 2

Where i represent country, t represents time; ε is the random error term. The parameter estimates are $\beta_1\ldots\beta_5$ and the random disturbance term is ε_{it}. Data has been obtained from the World Development database.

Estimation Issues

Applying regression on time series data may generate spurious results [26-27] due to the possibility of non-stationarity data. Hence, checking the stationarity of data is a prerequisite for applying co-integration test. As a result the Augmented Dickey-Fuller (ADF) test [28], 1981) and the Phillips-Perron test [27] were applied. Once, the variables are stationary of the same order, the second step is to check for co-integration test or long run co-integration relationship amongst the variables. The Johansen Co-integrating Test [30], which uses maximum likelihood testing process, is applied, to investigate the number of Co-integration vectors in the Vector Auto Regressive (VAR) setting.

Actually, the static single equation often fails to take

into account the presence of dynamic feedback among relevant variables. Accordingly, we chose to use a VAR approach to study the relationship between sustainable development and tourism growth. Such an approach does not impose a priori restriction on the dynamic relations among the different variables. It resembles simultaneous equation modelling, whereby several endogenous variables are considered together. The common form of VAR is as given;

$Zt = \lambda + \gamma t Zt\text{-}1 + \ldots\ldots\ldots + \gamma k\ Zt\text{-}k + \varepsilon t \text{--------}3$

Where Z is an (n x 1) vector of k variables having integrated of order 1 that is I(1), λ is a (n x 1) vector of intercepts, $\gamma t,\ldots..\gamma t\text{-}k$, are parameters and εt is a normally distributed residual term. The common VAR based model in equation (3) may also take the form of the vector error correction model (VECM) as follows:

$\Delta\ Zt = \lambda + \Gamma\ \Delta\ Zt\text{-}1 + \prod Zt\text{-}1 + \varepsilon t \text{----------------}4$

$$Z_{it} = lnTOU_{it,}\ lnRGDP_{it}\ ,lnCPI_{it},lnSEC_{it},lnHEA_{it},lnCO2$$
------5

Where Z is an (n x 1) vector of k variables having integration of order 1 that is I(1), λ is a (n x 1) vector of intercepts, εt is an (n x 1) vector of residuals. Further, Δ is the difference operator and Γ and $\prod$ are coefficient matrices. $\prod$ is also known as the impact matrix as it explains the long run equilibrium relationship of the variables; while Γ explains the short run effect. The VECM linking short term and long term causality between Tourism and sustainable development is set as follows;

$$\Delta lnTOU_t = \alpha_0 + \sum\nolimits_{j=1}^{n} \quad .\alpha_1 \Delta lnRGDP_{t-j} +$$
$$\sum\nolimits_{j=1}^{n} \quad .\alpha_2 \Delta lnCPI_{t-j} +$$
$$\sum\nolimits_{j=1}^{n} \quad .\alpha_3 \Delta lnSEC_{t-j} +$$
$$\sum\nolimits_{j=1}^{n} \quad .\alpha_4 \Delta lnHEA_{t-j} +$$
$$\sum\nolimits_{i=1}^{h} \quad .\alpha_5 \Delta lnCO2_{t-i} + \eta ECT_{T-1} + \varepsilon_t$$
-------------(6)

The coefficient of the error correction term (ECTt-1) indicates whether there exists a short run relationship among the time series variables. The sign and value of the coefficient provides information about the speed of convergence or divergence of the variables from their long run co-integrating equilibrium. A negative and significant coefficient of ECTt-1 is favourable for the stability of long run equilibrium.

3.0 ANALYSIS AND DISCUSSION

Table 1 shows the correlation matrix between the variables used in the analysis. It can be clearly seen that there are no multicollinearity issues in the series.

Table 1: Correlation Matrix

	LTOU	LGDP	LCPI	LCO2	LSC	LHEA
LTOU	1	0.5521	-0.1356	-0.2238	-0.3753	-0.1879
LGDP	0.5521	1	-0.3559	0.1655	-0.3877	-0.1591
LCPI	-0.1356	-0.3559	1	0.0127	0.0802	0.2124
LCO2	-0.2238	0.1655	0.0127	1	-0.0114	-0.2263
LSC	-0.3753	-0.3877	0.0802	-0.0114	1	0.0325
LHEA	-0.1879	-0.1591	0.2124	-0.2263	0.0325	1

Source: Author's computation

Results of Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), Fisher-ADF panel unit root tests and Phillips – Perron Fisher (PP) unit root tests shows that the variables are stationary at first level. Furthermore, cointegration test is being applied by allowing for individual fixed effects and time trends. The empirical findings are shown in table 2 confirming the presence of a long-run relationship among the variables.

Table 2: Pedroni Cointegration test

	Individual Fixed Effects	Individual Fixed Effects and time trends
	Statistics	
Panel v-Statistic	-0.822111	-1.406099
Panel rho-Statistic	2.313197	3.328819
Panel PP-Statistic	-1.193685	-0.949844
Panel ADF-Statistic	-1.113379	-1.582682
Group rho-Statistic	4.112313	4.923917
Group PP-Statistic	-2.125188	-4.211986
Group ADF-Statistic	-0.585631	-1.265133

Source: Author's computation

All the statistics reported are distributed as standard normal variates; considering the 10% level of confidence, the null hypothesis of no co-integration is rejected. Hence a long run equilibrium relationship among the variables has been established. The next step is to specify and estimate a VECM including the error correction term to investigate the dynamic nature of the model. In this study, the VECM is estimated using an optimum lag length of 1. The equations below report the long run results of the model.

LTOU = -28.4448 + 4.2762** LNGDP +2.1782 LNCPI − 1.1051 LNCO2*** + 0.3941 LNSC** -3.9451 LNHEA** –eq 7

$$\qquad\qquad (5.2021)\qquad (0.9821)$$
$$(-2.2447)\qquad (0.2886)\qquad (-1.73181)$$

** and ***shows significance at 5% and 1% respectively and the values in parentheses () are the t-statistics.

Analysing the impact of the economic factors on tourism development, it is observed that economic growth influences tourism development. For instance, the results show that an increase in growth rates of the small island economies leads to an increase in tourism development. This result confirms the economy-driven tourism growth hypothesis highlighting the fact that local economic expansion stimulates tourism growth. Better economic environment attracts business travellers and leads to an improvement in physical and human capital in terms of better and high quality infrastructure, health, and education [31-32]. Similar results were obtained by Fauzel et al, [12] and Seetanah et al, [13] for the case of the small island of Mauritius. As far as economic inflation is concerned, no significant result was obtained. It can be argued that other factors attracting tourists are more important and offset the impact of inflation [33].

The next sustainability factor considered is the environmental dimension proxied by carbon dioxide emission per capita. The results show that environmental degradation negatively impacted tourism growth. Similar results were found by Seetanah et al, 2019 for the case of SIDS, by Fauzel [18] for the case of Mauritius and Olya and Alipour [34], for the case of Cyprus. This is the case as island economies are mainly tourism led economies are more affected by changing environmental factors. For instance, adverse occurrences such as beach erosion, deterioration of coral reefs and damage to cultural heritage through floods as a result of increases in sea levels make small islands less attractive to tourists.

Flooding of both coastal and inland regions also threatens sanitation systems and freshwater supplies, leading to the spread of disease. Islands are also increasingly experiencing long periods of drought, cyclones and hurricanes, which adversely affects tourist flows [25].

Furthermore, apart from ecological and economic factors, social factors as well are found to be determinants of tourism development as per the results. In this study, secondary enrolment rate as well as health care has been used as social indicators. Both indicators influence tourism development. Several studies have argued that education and training are important to the achievement of sustainable tourism [35-36]. As highlighted by OECD, 2010, an appropriate provision of education and training schemes is crucial for the promotion of innovation and for the achievement of productivity improvements in the tourism industry. Education and training programmes are important to meet skills shortages and to raise the quality and productivity of the industry's workforce and thereby attracting tourists.

Moreover, health care in the host country is another social factor which is identified as an influencer of tourism development. Hundt [37] identifies several factors as determinants of tourism development which include social Infrastructure such as some level of development that allows for hospitals, transportation, some economic stability, some degree of protection against personal injury and theft. Other factors include quantity and quality of accommodations, sanitary conditions (including food and water) and the ability to speak the tourists' language. The present study shows that poor health care in the host countries deter tourism development.

Reverse Causation.

In order to investigate the existence of reverse causality between the main variables, equation 1 has been regressed but now real GDP is the dependent while tourists arrival is the independent variable. The results obtained are shown below;

LGDP = 6.6518 + 0.2338 LNTOU -0.5094 LNCPI +0.2584 LNCO2 – 0.0921 LNSC + 0.9225 LNHEA--8

$\quad\quad$ (1.9166)$\quad\quad$(12.8400)$\quad\quad$(2.1812) (0.2891)$\quad\quad$(1.7004)

$\quad\quad\quad\quad$ ***$\quad\quad\quad$ ***$\quad\quad$ ***$\quad\quad\quad\quad\quad$ *

The results show that tourism is a catalyst for growth. Several studies have confirmed the tourism led growth hypothesis. Similar results, for the case of island economies, were obtained by Seetanah [38] for the case of a sample of island economies, Seetanah et al, [13] for the Mauritian case and Narayan et al [39] for the case of pacific island economies. Hence, a bi directional causal relationship is observed between tourism and economic growth. The tourism sector is seen as an ingredient of economic growth, thereby generating government revenue as well as creating direct and indirect employment. It is also an important source of foreign exchange and can be considered to complement exports. This link is supported by the Keynesian theory arguing that tourism through the multiplier effect is considered as an exogenous component of aggregate demand and hence has a magnified positive effect on income [40]. Moreover, it also relates to the trade and endogenous growth theories as applied to the tourism sector [41].

The final step is to examine the direction of causality and for this purpose the Dumitrescu and Hurlin [42] test is employed. This causality test is based on the individual Wald statistic of Granger non-causality averaged across the cross section units. As per Dumitrescu and Hurlin [43], traditional causality test allows for homogeneous analysis across all panel sets, and thus neglect the specific causality across different units. However, this approach allows heterogeneity in coefficients across cross section panels. The two statistics Wbar-statistics and Zbar-statistics are easier to compute and provide standardized versions of the statistics. It tests the null hypothesis of no causality in

a panel subgroup against an alternative hypothesis of   causality in at least one panel.

Table 3: Dumitrescu Hurlin panel causality tests

Null hypothesis	W-Stats	Zbar-Stats	P-values	Direction of Causality
LGDP does not homogeneously cause LTOU	5.53717	5.46643	0.0000	
LTOU does not homogeneously cause LGDP	3.48478	2.05339	0.0402	LTOU↔LGDP
LCO2 does not homogeneously cause LTOU	3.69080	1.84116	0.0656	
LTOU does not homogeneously cause LCO2	9.38304	1.96849	0.0490	LTOU↔LCO2
LSC does not homogeneously cause LTOU	2.99032	4.71726	0.0000	
LTOU does not homogeneously cause LSC	2.70914	4.01362	0.0000	LTOU↔LSC

(X ↔Y indicates bi-directional causality)

Source: Authors' computation

At this stage, an investigation of causality between tourism, the economic indicator economic growth, the environmental indicator and the social indicator, education is done and presented in table 1. The result confirms the bi-directional causal link between tourism and economic growth, hence validating the 'feedback hypothesis' and consequently supporting both the tourism-led growth hypothesis and its reciprocal, the economic-driven tourism growth hypothesis. Similar results have been obtained by Cannonier et al, [42] for the case of small island economies. Also, a bi directional causality is found between the environment factor and tourism development. The tourism sector is affected by environment degradation and it remains an environment-sensitive industry. Moreover, tourism development is also a contributing factor to environmental degradation [15]. Environmental impacts of the tourism sector includes an increase in CO2 emissions among others. Finally, a bi directional causal relationship is found between tourism development and social development proxied by education level. Hence, while social development attracts tourists, the results show that tourism development leads to social development as well.

4.0 Conclusions

Tourism is a vital industry mainly for small island economies as there are many positive spillover effects. These include a significant increase in the host country's exports, contribute to economic growth, employment opportunities, development of infrastructure and massive flow of foreign income. While there is an overwhelming amount of research being done on the tourism- growth nexus, little attention has been devoted to studies on the link between tourism development and sustainability factors. Hence, the aim of the present study was to assess the impact of the sustainability factors, mainly economic, social and environmental indicators on tourism development. Using annual panel data of Small Island developing states from 1995 to 2018 in a PVECM framework, results confirm that tourism development is influenced by economic growth, social factors such as education and health care as well as environmental factors. While high growth rates, better education level as well as better health care in the host countries contributes towards tourism development, environmental degradation is seen as a deterrent factor. Moreover, the Dumitrescu Hurlin [41] panel causality tests confirm the existence of a bi directional causal link between tourism development and economic growth, hence validating the 'feedback hypothesis' and consequently supporting both the tourism-led

growth hypothesis and its reciprocal, the economic-driven tourism growth hypothesis. Also, a bi directional causality is found between the environment factor and tourism development. It shows that tourism development leads to environmental degradation and the latter also discourages tourist arrivals in the host countries. Finally a bi directional causal link is as well found between tourism development and social development.

The policy implications are interesting. For instance, given the small size and remoteness of the small island states, policies should concentrate towards attracting more tourists as it is an important contributor of economic growth. This can include an improvement in tourism infrastructure, such as, suitable transportation, attractive destinations, suitable tax incentives, luxurious resorts and proper security arrangements. However, in parallel with these policies, governments and policy makers should increase environmental protection policies, such as energy conservation and emission reduction. It is also important to devise policies that will protect the host countries' environment as well as their cultural sites. Else, it will be difficult to attain the objective of having sustainable tourism development.

While this research is innovative in investigating the moderating role of sustainable factors for the case of Small Island developing states, future work could dwell into similar analysis in a comparative way, either with other country samples or other moderating variables.

5. References.

[1] Briguglio, L. and Vella, L., 1995. The competitiveness of the Maltese islands in Mediterranean international tourism. *Island tourism: management principles and practice.*, pp.133-147.

[2] Hampton, M.P. and Christensen, J., 2007. Competing industries in islands a new tourism approach. *Annals of tourism research*, *34*(4), pp.998-1020.

[3] Milne, S., 1992. Tourism and development in South Pacific microstates. *Annals of tourism research*, *19*(2), pp.191-212.

[4] Scheyvens, R. and Momsen, J.H., 2008. Tourism and poverty reduction: Issues for small island states. *Tourism geographies*, *10*(1), pp.22-41.

[5] Wilkinson, P.F., 1989. Strategies for tourism in island microstates. *Annals of tourism research*, *16*(2), pp.153-177.

[6] Pratt, S., 2015. The economic impact of tourism in SIDS. Annals of tourism research, 52, pp.148-160.

[7] Sinclair, M.T., 1998. Tourism and economic development: A survey. *The journal of development studies*, *34*(5), pp.1-51.

[8] Balaguer, J. and Cantavella-Jorda, M., 2002. Tourism as a long-run economic growth factor: the Spanish case. *Applied economics*, *34*(7), pp.877-884.

[9] Modeste, N.C., 1995. The impact of growth in the tourism sector on economic development: the experience of selected Caribbean countries. *Economia Internazionale/International Economics*, *48*(3), pp.375-385.

[10] Durbarry, R., 2004. Tourism and economic growth: the case of Mauritius. *Tourism Economics*, *10*(4), pp.389-401.

[11] Steiner, C.J. and Reisinger, Y., 2006. Ringing the fourfold: A philosophical framework for thinking about wellness tourism. *Tourism recreation research*, *31*(1), pp.5-14.

[12] Fauzel, S. and Seetanah, B., 2021. Does financial development spur tourism growth? A dynamic time series analysis for the case of an SIDS. Journal of Policy Research in Tourism, Leisure and Events, pp.1-17.

[13] Seetanah, B. and Fauzel, S., 2019. An empirical analysis of the impact of foreign direct investment on tourism development: The Mauritian case. *Tourism Analysis*, *24*(4), pp.517-529.

[14] Brida, J.G. and Pulina, M., 2010. A literature review on the tourism-led-growth hypothesis.

[15] Ozturk, I. and Al-Mulali, U., 2015. Investigating the validity of the environmental Kuznets curve hypothesis in Cambodia. *Ecological Indicators*, *57*, pp.324-330.

[16] POPESCU, I.V. and Olteanu, V., 2014. LUXURY TOURISM: CHARACTERISTICS AND TRENDS OF THE BEHAVIOR OF PURCHASE. *Sea: Practical Application of Science*, *2*(2).

[17] Fauzel, S., Seetanah, B. and Sannassee, R.V., 2017. Analysing the impact of tourism foreign direct investment on economic growth: Evidence from a small island developing state. *Tourism Economics*, *23*(5), pp.1042-1055.

[18] Fauzel, S., 2020. The impact of changes in temperature and precipitation on tourists arrival: An ARDL analysis for the case of a SIDS. *Current Issues in Tourism*, *23*(19), pp.2353-2359.

[19] Louca, C., 2006. Income and expenditure in the tourism industry: time series evidence from Cyprus. *Tourism Economics*, *12*(4), pp.603-617.

[20] Levantis, T. and Gani, A., 2000. Tourism demand and the nuisance of crime. *International Journal of Social Economics*, *27*(7/8/9/10), pp.959-967.

[21] Içöz, O., 1991. The impacts of inflation on the tourism sector. *Anatolia*, *2*(13/14), pp.19-21.

[22] Mdusm, P. (2017). The positive and negative effects of Tourism on the social-cultural environment of a country. [Online]. Available: https://www.linkedin.com/pulse/positivenegative-effects -tourism-social-cultural-prince-mdusman [Accessed 14 August 2021].

[23] Potgieter, A., Campus, G., Berman, G.K. and Verity, J.M., 2019. The relationship between socio-cultural impacts of a township tour and the overall life satisfaction of residents in townships in the Western Cape, South Africa.

[24] Siddiqui, S. and Imran, M., 2019. Impact of climate change on tourism. In *Environmental Impacts of Tourism in Developing Nations* (pp. 68-83). IGI Global.

[25] Fauzel, S. & Seetanah, B. (2022), 'Climate Change and Tourism' in D. Buhalis (ed.), Encyclopedia of Tourism

Management and Marketing, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.

[26] Granger, C.W. and Newbold, P., 1974. Spurious regressions in econometrics. *Journal of econometrics*, *2*(2), pp.111-120.

[27] Phillips, P.C. and Perron, P., 1988. Testing for a unit root in time series regression. *Biometrika*, *75*(2), pp.335-346.

[28] Dickey, D.A. and Fuller, W.A., 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American statistical association*, *74*(366a), pp.427-431.

[29] Johansen, S., 1988. Statistical analysis of cointegration vectors. *Journal of economic dynamics and control*, *12*(2-3), pp.231-254.

[30] Johansen, S. and Juselius, K., 1990. Maximum likelihood estimation and inference on cointegration--with applications to the demand for money. *Oxford Bulletin of Economics and statistics*, *52*(2), pp.169-210.

[31] Lin, V.S., Yang, Y. and Li, G., 2019. Where can tourism-led growth and economy-driven tourism growth occur?. Journal of Travel Research, 58(5), pp.760-773.

[32] Eugenio-Martin, J.L., Martín-Morales, N. and Sinclair, M.T., 2008. The role of economic development in tourism demand. *Tourism Economics*, *14*(4), pp.673-690.

[33] Yong, E.L., 2014. Innovation, tourism demand and inflation: Evidence from 14 European countries. Journal of Economics, Business and Management, 2(3), pp.191-195.

[34] Olya, H.G. and Alipour, H., 2015. Risk assessment of precipitation and the tourism climate index. *Tourism Management*, *50*, pp.73-80.

[35] Cater, E. and Goodall, B., 1992. Must tourism destroy its resource base. *Environmental Issues in the 1990s*, pp.309-324.

[36] OECD (2010), "Tourism 2020: Policies to Promote Competitive and Sustainable Tourism", in OECD

Tourism Trends and Policies 2010, OECD Publishing, Paris. DOI: https://doi.org/10.1787/tour-2010-4-en

[37] Hundt, A., 1996. Impact of tourism development on the economy and health of Third World nations. Journal of travel medicine, 3(2), pp.107-112.

[38] Seetanah, B., 2011. Assessing the dynamic economic impact of tourism for island economies. *Annals of tourism research*, *38*(1), pp.291-308.

[39] Narayan, P.K., Narayan, S., Prasad, A. and Prasad, B.C., 2010. Tourism and economic growth: a panel data analysis for Pacific Island countries. *Tourism economics*, *16*(1), pp.169-183.

[40] Figini, P., Castellani, M. and Vici, L., 2009. Estimating tourism effects on residents: A choice modelling approach to the case of Rimini. *Advances in tourism economics: New developments*, pp.145-164.

[41] Lanza, A. and Pigliaru, F., 1995. Specialization in tourism: the case of a small open economy. *Sustainable tourism development.*, pp.91-103.

[42] Cannonier, C. and Burke, M.G., 2019. The economic growth impact of tourism in Small Island Developing States—evidence from the Caribbean. *Tourism Economics*, *25*(1), pp.85-108.

[43] Dumitrescu, E.I. and Hurlin, C., 2012. Testing for Granger non-causality in heterogeneous panels. *Economic modelling*, *29*(4), pp.1450-1460.