Importing to Feed International Tourists: Growth Implications for Islands across the Globe

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Abstract

The expansion of inbound tourism among global islands, amidst relatively inadequate supporting tradable goods, potentially triggers high merchandise imports, resulting in an indeterminate impact on economic growth. Employing fixed and random effects estimation techniques on five-year-non-overlapping-averaged data, covering 1980 through 2019, this study, firstly, investigates the potential bi-causal relationship between inbound tourism and merchandise imports, in the case of 45 sovereign islands. The economic growth implication of a concurrent pursuit of tourism expansion and merchandise imports is also examined. The study further investigates how over-reliance on imported merchandise to feed international tourists, and over-specialisation in the tourism sector, affect the tourism-led-growth hypothesis in the case of these islands. Results from the study show that an increase in inbound tourism significantly leads to an increase in merchandise imports, and vice versa. Also, importing merchandises to sustain inbound tourism is significantly observed not to be detrimental to economic growth. However, results further reveal that over-reliance on imported merchandises to sustain inbound tourism, as well as over-specialisation in tourism with the help of imported merchandises, both exert significant detrimental net effects on economic growth. The findings hold policy guidelines for the pursuit of tourism-led and merchandise-import-led growth strategies among global islands.

Keywords: Merchandise imports; Tourism specialization; Economic growth; Global islands; Fixed and random effects

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1. Introduction

Tourism expansion has been well praised in literature (see Brida & Pulina, 2010; Brida & Risso, 2010; Durbarry, 2004; Fayissa et al., 2008; Shahzad et al., 2017; Tang & Tan, 2015) as a key engine of growth for most countries, following the very first scholarly work of Balaguer and Cantavella-Jordá (2002). In fact, Brida et al. (2016), through an extensive review, confidently claimed that the tourism-led growth hypothesis (TLGH) has been strongly validated with the assistance of diverse empirical approaches, and theoretical frameworks. Diverse mechanisms have been embraced as potential paths through which economic growth diffuses from tourism. For instance, tourism has been applauded as a significant foreign exchange earner; helping to spur investments in infrastructure in host countries; stimulating ripple economic effects on other industries; generating employment; and assisting in the transfer of technical knowledge (Baidoo, Agbloyor, Fiador & Marfo, 2021; World Travel and Tourism Council (WTTC), 2013; Schubert, Brida & Risso, 2011).

Islands, defined by UNCTAD Handbook of Statistics (2005) as sovereign countries that are fully located within oceans, tend to benefit in huge proportions from tourism, given that the sector is usually a top priority within such economies. In line with this, Durbarry (2004) observed that tourism is the highest exchange earner for about one-third of developing islands across the globe. The heavy dependence on tourism by islands leaves their economies more sensitive to local and international economic and social shocks that directly or indirectly affect the performance of the sector. In confirmation to this, reports from the World Bank (2021; 2020) and World Tourism Organisation - WTO (2021) jointly alluded that recent gross domestic products (GDPs) recorded by islands across the globe have experienced sharp decline following the outbreak of the corona virus (COVID-19) pandemic. Undoubtedly, this is closely linked to a significant reduction in the numbers of international tourist arrivals among these islands.

Directly connected to the contributions of tourism to island economies, Schubert, Brida and Risso (2011) identified the art of commerce (buying and selling) as the greatest recipient of transformation from the waves of the sector's expansion. Schubert et al. (2011)'s claim is supported by records of huge wholesale and retail sectors within island economies. For this particular reason, the demand for basic goods and services - in the form of merchandises by tourism establishments (hotels, motels, restaurants, just to mention a few) and international tourists - has automatically generated higher levels of imports, in order to supplement or even substitute local production. The resulting effects include an outbreak of a wide range of local establishments directly outsourcing inputs (goods and services) through imports in order to sustain the ever-expanding accommodation and international tourism industries.

Islands are also typically charaterised with limited resources in terms of domestic water supply, and land. As such, such economies are usually compelled to reallocate agricultural lands towards the construction of accommodations, roads, airports and recreational tourism facilities (Nowak & Sahli, 2007). In addition, the large influx of tourists who periodically visit these islands put heavy strains on water resources for both domestic and commercial uses. Consequentially, traditional activities such as crop planting, animal

farming, fishing and forestry reserves that serve as the main sources of foodstuffs and merchandises on these islands are jeopardised, leaving the islands no option than to rely on imports for such basic inputs (Baidoo et al., 2021). Not surprising at all, the local establishments tend to depend materially on imported merchandises as their inputs. Figure 1 below confirms an increasing trend and close relationship between numbers of international tourist arrivals and imports of consumable merchandises among some selected islands. Observations from Figure 1 potentially tend to raise alarm about the fact that islands rely on imported basic merchandises to feed tourists and sustain their local tourism sector, and that these two indicators move in tandem in such economies. Interestingly, Sinclair-Maragh and Gursoy (2015) described the situation of importing to feed and sustain tourism sector among islands as "economic imperialism", following the earlier argument of Singh and Wright (2011). According to these scholars (Sinclair-Maragh & Gursoy, 2015; Singh & Wright, 2011), such practice triggers serious currency earning outflow and economic leakage problems for developing island countries. Congruently, similar discussions in literature tend to allude that although tourism development may potentially be growth enhancing, an unplanned attempt to over-rely on the sector, coupled with a heavy dependence on imported merchandises to feed international tourists, may possibly leak out fortunes, and rather heap detrimental net growth effects on hosting islands. Impliedly, the net economic growth effects from the concurrent increase in international tourist arrivals alongside with uncontrolled reliance on imported merchandises, to feed and sustain tourism among islands, may be obscured.

[Insert Figure 1 Here]

Although earlier studies including Baidoo et al. (2021), Sinclair-Maragh and Gursoy (2015), Milne (1992, 1990), Archer (1982), Britton (1980), and Varley (1977) have jointly alluded that heavy reliance on imported consumable merchandises by islands to sustain tourism industries may potentially spur welfare deteriorations among the indigenes, to the best of our knowledge, there is not a single empirical attempt to assess whether or not such a claim is valid. This current situation has left policy makers and tourism development planners across the globe, and among sovereign islands in particular, in a state of uncertainty on this particular angle of the debate. Against these backgrounds, this study seeks to fill these gaps in literature in the following unique ways. Firstly, the study investigates, empirically, whether or not the influx of international tourist arrivals impacts on the imports of consumable merchandises, and vice versa, in the case of sovereign islands across the globe. Secondly, the study investigates the interactive "net effect" of international tourist arrivals and imports of merchandises on the economic growth potentials of these islands. Thirdly, the potential moderating effects of these two common phenomena, over-reliance on imported merchandises to feed international tourists, and over-expansion (over-specialisation) of the tourism sector, on the old-aged tourism-led-growth hypothesis, are empirically studied, in case of these islands.

The remaining sections of the paper are structured as follows. Section 2 presents some stylised facts on the trends in international tourist arrivals, merchandise imports and growth patterns among islands across the globe. Sections 3 and 4 respectively present the review of related literature and the empirical methodologies adopted. Section 5

discusses empirical findings from the study. Section 6 provides a conclusion, with ensuing policy recommendations.

2. Stylised Facts

Global sovereign islands have consistently experienced significant increment in tourism expansion, merchandise imports, and economic growth, over the last three to four decades. Table 1 below summarises important observations from data obtained from the World Development Indicators (WDI) database on the aforementioned variables of interest. In Table 1, the "decade-on-decade" mean values of the variables are statistically compared, together with their paired *t*-test results for significance.

[Insert Table 1 Here]

Although tourism expansion is observed throughout the sample period, it is further reckoned that the industry boomed statistically higher within the years 2010 through 2019, compared to 2000-2009, and 1990-1999 decades. More precisely, over the last three most recent decades, data on tourism variables suggest that: i) the number of international tourist arrivals for global islands has doubled; ii) there has been over 250% growth in international tourism receipts among the islands under discussion; iii) and that international tourism receipts per tourist – a rough measure of how much each international tourist averagely spends per each visit – has also significantly increased from US$ 773.5 to US$ 1,136.5, though in nominal terms.

Similarly, the levels of merchandise imports show consistent significant increments over the decades under consideration. Even though the average value of food imports (as a percentage of merchandise imports) recorded a significant decline within the very first two decades, it assumed a significant increasing pattern in last two decades, recording a large increase of 16.78% and 19.79% for 2010 – 2019 and 2000 - 2009 decades, respectively. It therefore seems to emphasize that the long-lasting reasons that discourage tourist sites and hotels from using more local merchandises and consumables, as documented by Bélisle (1983, 1984), are still persistent among global islands. As summarized in the work of Telfer and Wall (1996), Bélisle (1983, 1984) argued, among others, that "*the reasons include tourists' preference for foods similar to those found in their own countries; imported food may be cheaper; hotels are willing to pay more for imports to ensure quality and/ or a reliable supply; the quality of local food is not as good as imports (especially hygienic quality); hotel entrepreneurs may not be aware of the types and qualities of local foods available; farmers want to maintain their traditional crops and are not able to increase their production; farmers lack information on food requirements of hotels; hotels and farmers are inhibited from dealing with each other; and farmers or intermediaries are unreliable in maintaining a regular supply of local products or fulfilling contract agreements".* With these ever-plausible reasons, it is not too surprising that the rate of increase in food imports among islands is at its alarming stages. Could it be that the very hindrances facing the food supply chain within island economies, as have been enshrined in existing literature (see Telfer & Wall, 1996; Bélisle, 1983, 1984), have not

been tackled and responded to by the government and private authorities within their tourism ecosystem?

Meanwhile, economic growth indicators showed no statistically significant change over the four most recent decades under consideration. For instance, GDP growth rates and GDP per capita growth rates consistently hovered around 3% and 1.8%, respectively.

3. Review of Related Literature

Universally, literature seems to suggest that the growth implications of tourism are enhanced in instances of increasing number of tourist arrivals, increasing tourists' length of stay, and increasing tourists' expenditure (Telfer & Wall, 1996). Aside these key strategies, another innovative approach for squeezing higher economic benefits from the tourism sector, especially among islands, is to expand the sector's backward economic integration by promoting local food production (Torres, 2003). Torres (2003) further contended that such a robust approach helps retain tourism earnings within the region, and improves the distribution of tourism benefits to rural indigenes, as they become major economic stakeholders of the sector. In a more expanded form, it tends to mean that deliberate reliance on local sources of merchandises, which includes foodstuffs (meat, poultry, seafood, dairy, groceries, processed fruits and vegetables, canned goods, cereals, liquor, coffee, honey, and vanilla), jewelries, art works, clothes (customs, and t-shirts), handicrafts, woven bracelets, carved woods, and educational materials (for more list, see Bélisle, 1984; Pratt, 2013), to feed tourists and residents of islands is the ideal strategy for reaping sustained economic benefits from the sector. In connection to this, earlier scholars, including Cohen (1982), have warned that emerging tourist destinations that do not promote multipliers effects and higher levels of backward linkages stand the chance of not benefiting substantially from tourism. To this effect, Cohen (1982) warned that higher levels of economic leakages, precipitated by inadequate integration of the tourism sector with other local sectors, easily limit the full economic contributions from the sector, thereby fostering resentment amongst local residents about the industry. Undoubtedly, the take-home message from these studies was for nations to reduce economic leakages that primarily emanates from the import of merchandises to sustain their local tourism industries.

Although the existing theories, in the lights of absolute and comparative advantages, and Heckscher-Ohlin (H-O) model, applaud international trade (and its components of import and export) to be economically rewarding, there are also potential instances of trade-offs and even net detrimental effects on most sovereign states, of which islands are of no exception, if the phenomenon is not well managed. For instance, in the case of Mauritius, an island, Tang, Tregenna and Dikgang (2019), using OLS and 2SLS estimation approaches on annual data from the year 1963 through 2013, found that general import, as an alternative measure of trade openness, significantly promotes growth. Similarly, and more specifically in the case of islands, Campbell (2012), Rao (2010), and Pradhan, Bagchi, Chowdhury and Norman (2012) contended that international trade significantly promotes growth among Barbados, Fiji and Iceland, respectively. In the face of these, literature is still cautious to absolutely believe that imports always yield

significant positive effects on growth, especially in the case of tourism-dependent countries. In line with this, Nowak, Sahli and Cortés-Jiménez (2007), on the case of Spain, an equally tourism-dependent economy, opined that the aforementioned claim may only be true when majority of imports come into the host countries in the form of capital goods. This tends to be in line with Makun's (2018) argument that the growth effect of imports partly depends on the composition of the materials; be it capital goods, machinery, intermediate production inputs, or consumable merchandises.

In addition, existing literature have concentrated mostly on investigating how tourism development translates into growth in host countries mainly through increase in the prices of non-traded goods (Mishra, Sharma & Smyth, 2010). This phenomenon is popularly described by earlier scholars as an interplay of international trade on the tourism-growth hypothesis (Josef & Ravinesh, 2016; Hazari & Nowak, 2003). As such, there is gross abandoning of the potential complex moderating role merchandise imports may or may not play in the traditional tourism-growth nexus. For instance, Copeland (1991) popularly indicated that the influx of international tourists to consume local amenities and non-tradable goods creates a level of monopolistic effects in pricing in the host countries, thus, leading to improvement in real exchange rate and subsequently, welfare enhancement. However, Copeland's (1991) claim may be challenged given that the effect of growing merchandise imports, among tourism reliant countries, especially islands, on the tourism-growth nexus is woefully left out of this crucial analysis. Could it therefore be possible that the tourism-led-growth hypothesis may be altered if the ever-increasing trends in merchandise imports is factored in the analyses, especially in the case of islands? The analysis gets extended upon considering the stance of extant literature, including the work of Bojanic and Lo (2016), which allude that over-reliance on tourism expansion could potentially be detrimental to economic development, especially in the case of small island developing states (SIDS).

Further, Katircioglu (2010) investigated the long-run equilibrium and causality among exports, imports and economic growth in the case of Cyprus, an island. Employing autoregressive distributed-lag (ARDL) models, ARDL error correction approach and conditional granger causality tests, Katircioglu's (2010) results rejected the validity of import-led growth hypothesis, and rather recommended an increase in the exportation of merchandises as a route of eliciting growth in the island. Meanwhile, Mishra et al. (2010) with a panel framework on pacific islands - Fiji, Papua New Guinea, Solomon Islands, Tonga and Vanuatu - examined whether or not the economic growth of these countries is export or import led. With the help of panel unit root, panel co-integration and panel Granger causality approaches, Mishra et al. (2010) established evidence in support of import-led growth for these panel of Pacific islands. Also, Tang et al. (2019) applied ordinary least squared (OLS) and two-stage least squares (2SLS) estimation approaches on annual time series data from 1963 and 1970 through 2013 to investigate the impact of trade openness on growth in the case of Mauritius, an island. Results from the study of Tang et al. (2019) revealed, among others, that imports, measured as total import scaled by GDP, significantly promote growth. On Fiji islands only, Makun (2018) employed annual time series data from 1980 through 2015 to, among others, investigate

the effect of imports on growth. With the help of ARDL estimation technique, Makun (2018) opined that in the long-run, imports have significant negative impact on growth.

In connection to these, Bélisle (1984) investigated how the relationship between food imports and tourism development is being moderated by hotel size, hotel class, hotel ownership, and hotel locations, in the case of Jamaica – an island. Among others, Bélisle (1984) observed that hotels that are huge in size and are of higher class tend to significantly rely on imported merchandises to feed tourists, even though the same could not be said for foreign-owned hotels, and those located at tourist areas characterized by high-class, large, and foreign-owned facilities. Similarly, Sampedro et al. (2018) studied food systems in Galapagos Archipelago of Ecuador and observed that the influx of tourists has increased the island's reliance on imported foods, as local agricultural outputs keep dwindling in favour of tourism expansion. In fact, Sampedro et al. (2018) further noticed that imports are the largest source of food on the Galapagos Archipelago of Ecuador island, and concluded that the current 75% of agriculture food supplied outside the island would shoot up to 95% by the year 2037 if the food policies remained unchanged. Not so surprising, even in the case of Germany, which is not an island, Fischer (2004) empirically established that international tourism significantly promote the imports of wine, cheese and processed/preserved vegetables from France and Italy. Given that conscious efforts to ensure food security on most islands through local agritourism currently seem futile and unattainable (Thomas, Moore & Edwards, 2018), it stands to reason that reliance on imported merchandises to feed both residents and international tourists would be long practiced.

Consolidating the trends in existing literature, the following related and worth investigating lacunas are examined: that the potential bi-causal relationships between international tourist arrivals and the imports of consumable merchandises still remain unexamined empirically, most particularly, in the case of global islands that often specialize in tourism; that merchandise imports, as a sub-component of international trade, has not been disjointedly examined on economic growth, most especially in the case of islands that are fond of potentially depending heavily on such avenues to sustain their local industries, including tourism; that the joint potential growth implication from tourism expansion and merchandise imports in case of islands has not been examined, though there exist the tendency that most islands are tempted to feed international tourists with imported consumable merchandises; and that the potential moderating effects of these two common phenomena – overly reliance on imported merchandises to feed international tourists, and over-expansion (over-specialisation) of the tourism sector – on the tourism-led-growth hypothesis have also not been examined, in case of global islands. Our empirical analyses attempt to fill these aforementioned existing gaps in literature.

4. Empirical Methodology

This study draws data from the World Bank's database, World Development Indicators (WDIs), on forty-five (45) sovereign islands across the globe (based on data availability), and employs quantitative panel analyses. Variables of interest on these islands were

collated for four decades, from the year 1980 through 2019. The 40-year annual data were transformed by adopting a conventional five-year non-overlapping averaging technique, yielding eight sub-periods/"times" (hereafter referred to as "periods") for each island as follows; 1980-1984, 1985-1989, 1990-1994, 1995-1999, 2000-2004, 2005-2009, 2010-2014, 2015-2019. We embrace this strategy in this particular study for two important reasons; firstly, to smoothen out the effects of business cycles, and secondly, to reduce the instances and impact of missing data points, on the estimations, following the work of Houeninvo and Lankoande (2022), Gaies, Goutte and Guesmi (2020), and Su and Liu (2016). Furthermore, by employing the five-year non-overlapping averaging technique, potential effects of time trend on the regressions are partly eliminated, leading to the avoidance of spurious relationships among the variables.

To construct Equations (1) and (2) in an attempt to investigate the potential bi-causal relationships between international tourist arrivals and merchandise imports in the case of islands, we respectively follow Fischer (2004), and Martins, Gan and Ferreira-Lopes (2017), Assaf and Josiassen (2012), Naudé and Saayman (2005) and Su and Lin (2014), and consider modified panel models of the form:

$$lnMI_{i,t} = \alpha_1 lnTA_{i,t} + \sum_{j=2}^{5} \alpha_j Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$lnTA_{i,t} = \phi_1 lnMI_{i,t} + \sum_{j=2}^{5} \phi_j Controls_{i,t} + \zeta_{i,t} \quad (2)$$

where $\varepsilon_{i,t} = v_t + u_i + \gamma_{i,t}$

$\zeta_{i,t} = \psi_t + \upsilon_i + \tau_{i,t}$;

$lnMI_{i,t}$ is the natural log of the monetary value of merchandise imports (in current US$); $lnTA_{i,t}$ denotes tourism development, represented by the natural log of international tourist arrivals (see Cannonier & Burke, 2019; Samimi, Sadeghi & Sadeghi, 2013; Seetanah, 2011).

Augmenting earlier models (as adopted from Baidoo et al., 2021; Cannonier & Burke, 2019; Fauzel, Seetanah & Sannassee, 2017; Yazdi, Salehi & Soheilzad, 2017), Equation (3) below seeks to estimate the unconditional effects of merchandise imports on economic growth, while passively revisiting the tourism-led growth hypothesis, this time, in the case of global islands. Similarly, Equations (4) to (6) respectively aim to investigate the interactive "net effect" of international tourist arrivals and merchandise imports on economic growth; the growth implication of merchandise imports in the case of tourism-dependent (over-reliant) islands; and the growth implication of tourism in the case of islands that over-rely on imported merchandises.

$$EG_{i,t} = \nabla_1 lnTA_{i,t} + \nabla_2 lnMI_{i,t} + \sum_{j=3}^{6} \nabla_j Controls_{i,t} + \otimes_{i,t} \quad (3)$$

$$EG_{i,t} = \beta_1 lnTA_{i,t} + \beta_2 lnMI_{i,t} + \beta_3 (lnTA_{i,t} \times lnMI_{i,t}) + \sum_{j=4}^{8} \beta_j Controls_{i,t} + \eta_{i,t} \quad (4)$$

$$EG_{i,t} = \delta_1 HTD_i + \delta_2 lnMI_{i,t} + \delta_3 (HTD_i \times lnMI_{i,t}) + \sum_{j=4}^{8} \delta_j Controls_{i,t} + \pi_{i,t} \quad (5)$$

$$EG_{i,t} = \propto_1 lnTA_{i,t} + \propto_2 HMI_i + \propto_3 (lnTA_{i,t} \times HMI_i) + \sum_{j=4}^{8} \propto_j Controls_{i,t} + \kappa_{i,t} \quad (6)$$

where $\otimes_{it} = \oplus_t + \varnothing_i + \cap_{it}$

$\eta_{it} = \acute{y}_t + \acute{u}_i + \varphi_{it}$

$\pi_{it} = \ddot{e}_t + Þ_i + \sigma_{it}$

$\kappa_{it} = \ddot{y}_t + \ddot{o}_i + \gamma_{it}$

For all equations (1, 2, 3, 4, 5 and 6 above), subscripts i and t denote cross sectional country dimensions, $i = 1 \ldots N$ (N = 45 countries), and time/period series dimensions, $t = 1 \ldots T$ (T= 8 periods), respectively. As shown above, the composite error terms, ε_{it}, $\zeta_{i,t}$, $\otimes_{i,t}$, η_{it}, π_{it}, and κ_{it}, are further decomposed into country and time specific effects, and the remaining disturbance error terms, with an expected average of zero, and a constant and finite variance over all periods under consideration. The α's, ∇'s, ϕ's, β's, δ's, and $\propto$'s represent the various estimable parameters.

EG_{it} denotes economic growth. To ensure robustness in our findings, we engage two different conventional proxies (see Koju, Koju & Wang, 2020; Agbloyor et al., 2016; Seetanah & Khadaro, 2007) to measure economic growth: GDP growth rates, and GDP per capita growth rates, both derived from 2010 constant local currencies (following the works of Pavlic, Svilokos and Tolic (2015) and Rapetti, Skott and Razmi (2012)). In Equation (4), the term $lnTA_{i,t} \times lnMI_{i,t}$ represents the multiplicative interaction between the natural logs of international tourist arrivals and merchandise imports, therefore enabling the estimation of conditional effects of the former and the latter, and the subsequent computation of their asymmetric combined "net or marginal effects", on economic growth among global islands.

In Equation (5), the term HTD_i is a dummy or dichotomous variable that is coded "1" for a time/period within which a country qualifies as a tourism-dependent islands, and "0" otherwise. Particularly, the present study follows a conventional empirical approach in classifying periods of the islands as either tourism-dependent or not (for multiplicative interaction models, see Chee and Nair (2010) and Brambor et al. (2006)). To construct dummies to capture over specialization in tourism, we divide the number of international tourist arrivals by countries' respective population, compute the mean of that ratio, and use that mean as the benchmark to establish the two groups – high, and low tourism dependence, such that the HTD_i dummy variable takes "1" for a particular period when its corresponding ratio (international tourism, number of arrivals divided by population - $TA_{i,t}/population$) is equal to or greater than the average of the same ratio derived from the full sample. We employ this strategy to capture the relative importance of international tourist arrivals in each island economy. The HTD_i dummy variable is then interacted with $lnMI_{i,t}$ as a modeling strategy to investigate the impact of merchandise imports on economic growth in the case of tourism-dependent islands (that is, whether or not differing levels of tourism dependence moderate the impact of merchandise imports on economic growth among islands across the globe). By extension, this modelling strategy allows the study to concurrently estimate the "high-tourism-dependence conditional effect" and "the merchandise imports conditional effect", which are central towards the computation of the combined "net effect" of the former and the latter on economic growth among global

islands. This yet to be computed "net effect" is ultimately needed for conclusive analyses in this study.

Similarly, in Equation (6), HMI_i is a dummy variable that takes "1" for islands that depend heavily on imported merchandises, and "0" otherwise. To construct dummies to capture periods of over-reliance on merchandise imports, we divide the merchandise import variable by GDP ($MI_{i,t}/GDP_{i,t}$), and compute the mean of that ratio. The mean ratio is used as the benchmark to establish the two groups - high, and low reliance on merchandise imports, such that the HMI_i dummy is coded "1" for a particular period when its corresponding ratio is equal to or greater than the average of the same ratio derived from the full sample. Again, we employ this strategy to capture the relative importance of merchandise imports in each island economy. The HMI_i dummy variable is then interacted with $lnTA_{i,t}$, in order to investigate the impact of international tourist arrivals on economic growth, in the case of high-merchandise-import-dependent islands (that is, whether or not differing levels of merchandise imports moderate the impact of tourism on economic growth among global islands). Put differently, this modelling strategy enables a simultaneous estimation of the "high-merchandise-imports-dependence conditional effect", and "international tourist arrivals conditional effect", which are critical in computing the joint "net effect" of the former and the latter on economic growth among global islands. Notice that all these yet to be computed "net effects" are ultimately needed for conclusive analyses in this study.

Also, for Equations (5) and (6), we employed the above strategy following Karikari et al., (2021), Agbloyor et al. (2016), Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004), Kusi, Agbloyor, Ansah-Adu and Gyeke-Dako (2017), Chee and Nair (2010), and Brambor et al. (2006), given that such technique preserves the number of observations used in the analysis.

Taking cue from extant literature on tourism induced-growth models (see Baidoo et al., 2021; Cannonier & Burke, 2019; Yazdi et al., 2017), we also control for foreign direct investments (FDIs), net inflows as scaled by GDP; real exchange rate (ER); trade openness (TO); national expenditures (NE); and financial development (FD). The present study also controls for six additional dummy variables (that is, Africa, Europe, Asia, North America, South America, and Oceania) in order to capture potential differing continent-specific effects in the models. Table 2 below summarises this section.

4.1 Justification for the choice of control variables

Foreign Direct Investments ($FDI_{i,t}$): Foreign direct investment (FDI) is defined as the net inflows of investments to achieve control and lasting management interests of a minimum of 10% in a business primarily operating in a country apart from that of the investor. The FDI variable shows net inflows (new investment inflows less disinvestment) in the receiving economy from foreign investors, scaled by GDP, following earlier works (Agbloyor et al., 2014; Asiedu, 2002, 2006). We expect FDIs to have a positive impact on international tourist arrivals, and on merchandise imports, and economic growth as it serves as an additional source of finance for investments within islands across the globe.

Real Effective Exchange Rate ($ER_{i,t}$): It measures prices of goods and services in U.S. dollar relative to prices at home. Following earlier works (see Pavlic, Svilokos & Tolic, 2015; Habib, Mileva & Stracca, 2017; AbuDalu, Ahmed, Almasaied & Elgazoli, 2014; Rapetti, Skott & Razmi, 2012), we compute it as nominal effective exchange rate divided by a price deflator or index of costs, in constant 2010 terms, expressed as national currency units per U.S. dollar. The influence of real effective exchange rate on imports, tourism development and economic growth in host countries has been established in extant literature (see Adigwe, Ezeagba, & Udeh, 2015; Yazdi et al., 2017; Obi, Martin & Obi, 2016; Oseni, 2016). We expect real effective exchange rates to influence economic growth and tourism development positively. Although increment in real effective exchange rate (depreciation in local currencies) is generally expected to influence merchandise imports negatively, we contrarily expect the relationship to be positive, for islands, however, given that these countries seem not to have enough alternatives from local sources even in periods where the variable moves in an unfavourably direction.

Trade Openness ($TO_{i,t}$): Following Agbloyor et al. (2014), we adopt the summation of total imports and exports scaled by GDP as the conventional measurement for trade openness. Trade openness is essential for merchandise imports, tourism developments, and economic growth, and thus, the study expects the former to positively impact the dependent variables.

Financial Development ($FD_{i,t}$): The relationship between financial development and other economic variables, including economic growth, is well researched. Studies such as Agbloyor et al. (2014), Alfaro et al. (2004), and Azman-Saini, Law and Ahmad (2010) project numerous benefits from financial development to include savings mobilization, transaction facilitation, just to mention a few. This study expects financial development to have a promoting impact on the dependent variables.

National Expenditures ($NE_{i,t}$): National expenditures refer to the sum of household final consumption expenditure, general government final consumption expenditure, and gross capital formation, all scaled by GDP. Following Nyasha and Odhiambo's (2019) extensive theoretical and empirical review work that validates national and public expenditures as significant determinant of economic growth, this study similarly expects the former to promote not only the latter, but also merchandise imports and international tourist arrivals among island economies.

[Insert Table 2 Here]

4.2 Descriptive statistics

Table 3 below summarises the statistical features of the data on the islands under examination. As a measure of central tendency and dispersions within the dataset, the mean of each variable with their respective standard deviations are reported. The mean of merchandise imports (current US$) over the four decades stood at US$ 7.09 trillion. Meanwhile, Tuvalu recorded the least merchandise imports of US$ 3.4 million during the five-year period from 1980 through 1984, whereas Singapore recorded the highest averaged value to the tune of US$ 361,442.8 million (US$ 361.4428 trillion) over the five-

year period from 2010 through 2014. The annual number of international tourist arrivals among the islands averaged 1,426,463, and moved as high as 17,336,700 (17.3 million) tourist arrivals (in the case of Singapore over the five-year period from 2015 through 2019). Also, the average of GDP growth and GDP per capita growth for the entire dataset stood at 3.13% and 1.71%, respectively, with Nauru recording the highest averaged value in both (17.93% and 13.68%, respectively) over the five-year period from 2010 through 2014.

[Insert Table 3 Here]

4.3 Correlation

In Table 4 below, we present the Pearson's correlation matrix among the variables. Table 4 shows that the most correlated variables were the two robust proxies for economic growth [GDP growth rates and GDP per capita growth rates) and recorded significant correlation coefficients of above +0.9. However, this does not raise multicollinearity concerns given that these two proxies for economic growth were not employed *at the same time as regressors* in any of the six models during the estimation processes. Meanwhile, Table 4 further shows a significantly strong correlation coefficients of +0.849 between international tourist arrivals, and merchandise imports, a signal for multicollinearity and endogeneity concerns (see Wooldridge, 2015). Though this is above the traditional ± 0.8 threshold (see Asongu and Odhiambo, 2017), the variance inflation factors (VIFs), as shown in Table 3, reveal the absence of multicollinearity problem as they were all below the threshold of 10 (see Pulido-Fernández & Cárdenas-García, 2021; Belsley, 1982; Tang et al., 2019). In addition, both international tourist arrivals, and merchandise imports recorded significant positive correlation coefficients with all the two robust proxies of economic growth employed in this study. Aside these, all other correlation coefficients are within the acceptable limit.

[Insert Table 4 Here]

4.4 Diagnostic tests and estimation procedures

By way of ensuring the estimation of reliable and efficient parameters for analyses, through the choice of appropriate models and estimation techniques, this study undertakes diagnostic checks, and reports the results in Table 3 and Appendices I and II.

Table 3 presents the results from Shapiro-Wilk W test for normality on the variables. The results show that none of the variables exhibit normality, as we reject the null hypothesis at the conventional levels of significance. Following Baum, Schaffer and Stillman (2002), the results in Appendix I present a part of the Hausman test results (full results are presented as part of the main regression tables). Also, results presented in Appendix II show the absence of cointegration between international tourist arrivals and merchandise imports (the two most suspected endogenous variables of interests) according to Pedroni's (1999, 2004) and Kao's (1999) tests, even though Westerlund's (2005) test signals the presence of cointegration in some panels (partly confirming our

observations from Figure 1, at least for most of the nine sovereign islands shown). The presence of endogeneity, coupled with the absence of cointegration between the most correlated variables (international tourist arrivals, and merchandise imports), especially in equations (1) and (2), due to simultaneity, form the bases for choosing either fixed effects (FE) or random effects (RE) as the robust estimation techniques over the ordinary least squares - OLS (see Wooldridge, 2015; Roberts & Whited, 2013; Reeb, Sakakibara & Mahmood, 2012; Nakamura & Nakamura, 1998). It is worth noting that the results from the Hausman test recommend the use of RE and FE for different models.

5. Discussion of Empirical Results

Table 5 presents the empirical results on the test for a bi-causal relationship between international tourist arrivals and merchandise imports among sovereign islands across the globe. Model 2 shows that an increase in the arrival of international tourists leads to a significant increase in the imports of merchandises. Precisely, on average, a 1% increase in international tourist arrivals leads to about 0.85% increase in the imports of merchandise into the economies of these islands. Model 1 also confirms that the import of merchandises reversely attracts international tourists to these islands, to the extent that a 1% increase in the former averagely triggers about 0.84% increase in the latter.

[Insert Table 5 Here]

These findings tend to suggest that the expansion of tourism, as a sector among global islands, compels such economies to import merchandises (either moderately or overly rely on imported merchandises) in providing most basic consumables required by international tourists. This observation reiterates the words of Schubert et al. (2011, p. 381), that *"The greatest impact of tourism is on commerce, as is evidenced by the size of the Wholesale & Retail Trade sector. The purchase of goods and services by tourism establishments and the visitor population has generated a level of imports that is out of proportion with the demands of the domestic population".* Our findings partly confirm the argument of Capó, Font and Nadal (2007) that a boom in tourism among islands tends to trigger an increase in the production of non-tradable goods at the expense of tradable goods, thus, naturally leading to an increase in the imports of latter. To this effect, majority of foodstuffs (meat, poultry, seafood, dairy, groceries, processed fruits and vegetables, canned goods, cereals, liquor, coffee, honey, and vanilla), jewelries, art works, clothes (customs, and t-shirts), handicrafts, woven bracelets, carved woods, educational materials, and even drinking water (for more list, see Bélisle, 1984; Pratt, 2013) are imported to these islands. This is not surprising as data from the WDI (see Table 1) confirm that the proportion of food imports alone (as a percentage of merchandise) averagely stood above 16% throughout the four decades under examination, and was even higher to about 50.80% for Guinea-Bissau during the years 2000 through 2004. This particular empirical observation is in line with the findings of Sampedro et al. (2018) in the case of Galapagos Archipelago of Ecuador island, as well as Fischer (2004), in the case of Germany. The results of this study therefore side with the claims of Thomas et al. (2018) that the absence of conscious efforts to ensure food security on most islands through local

agritourism stands to reason that reliance on imported merchandises to feed both residents and tourists would be long practiced.

Additionally, results from our study partly reveal that the availability of imported merchandises within the tourism industries of islands tends to attract more international tourists. A careful look at the magnitude of impact (the coefficients) from the bi-causal relationships suggests a significantly stronger positive pulling-force from merchandise imports to international tourist arrivals, and vice versa. This tends to imply that most international tourists consider to be sure that the kind of consumables served at these islands are of international standards and origin. Put differently, islands that serve imported and intercontinental consumables tend to attract more international tourists. This is partly so because tourists may not be willing to totally change their usual food-baskets during their visits to these islands (Telfer & Wall, 1996). By these results, we, therefore, revise the claims of earlier scholars (including Martins et al., 2017; Naudé & Saayman, 2005; Su & Lin, 2014; Milne, 1992; Yacoumis, 1987) and postulate that aside the usual natural, cultural, and historical components of tourism products among islands, the availability of imported merchandises/consumables/tradable goods partly lures in more international tourists.

Touching briefly on the control variables in Table 5, we also find evidence that FDI exerts significant negative impact on international tourist arrivals. Meanwhile, increment in FDI, financial development and national expenditures were observed as significant promoters of merchandise imports, whereas real exchange rates rather proved to exert significant negative impact.

The test on the interactive effect of tourism expansion (influx of international tourists) and merchandise imports on economic growth reveals intriguing results. Firstly, results from models (3) and (1) of Table 6 reveal that the unconditional impact of international tourist arrivals and merchandise imports on economic growth are significantly positive. This tends to suggest that without considering the potential interplay, influencing and moderating relationship between them, both international tourist arrivals and merchandise imports are valid routes to increasing economic growth among global islands. Also, models (2) and (4) of Table 6 show significant conditional increasing effects from international tourist arrivals and merchandise imports on GDP per capita growth, and a respective reductive and increasing effects on GDP growth, in events where the two strategies are pursued in silos (without each other). This notwithstanding, the concurrent conditional increasing effects of international tourist arrivals and merchandise imports on GDP per capita growth plumet significantly as they are pursued together, projecting a substitutional relationship between them (i.e., the coefficients of the interaction term in model (2) of Table 6 is significantly negative). Meanwhile, the respective conditional increasing and reductive effects of merchandise imports and international tourist arrivals on GDP growth collectively turns to be significantly positive upon their joint pursuit, thus, projecting a complementary relationship between them (i.e., the coefficients of the interaction term in model (4) of Table 6 is significantly positive). Intuitively, we partly conclude that international tourist arrivals and merchandise imports are substitutes towards GDP per capita growth, but complement each other towards GDP growth. Partly consistent with the findings of Baidoo et al. (2021) (who

similarly observed that tourism expansion negatively affects economic growth among islands within the sub-Saharan Africa), the results further suggest that the conditional effect of an influx of international tourists, without merchandise imports, is significantly negative on GDP growth (see model (4) of Table 6). This particular observation reveals that expanding international tourist arrivals without supportive imported merchandises results in significant detrimental impact on the GDP growth patterns of global islands, and that the two should not be pursued in silos. By this, the results also seek to imply that the right concurrent pursuit of international tourist arrivals and merchandise imports would significantly spur up GDP growth, and GDP per capita growth, for islands across the globe. This is impliedly confirmed as the symmetric net effects of each of these aforementioned variables of interest, conditioned on the other, are significantly positive on economic growth for these islands (see the computed "net effects" in models (2) and (4) of Table 6).

[Insert Table 6 Here]

More critically, findings from models (2) and (4) of Table 6 show that the concurrent pursuit of tourism expansion and merchandise imports potentially results in two intriguing, though statistically unequal, magnitudes of impacts on economic growth, as follows: i) that as long as islands induce more international tourist arrivals by serving imported consumables and merchandises, the resulting net effect on economic growth would be positive, though statistically minimal (see a relatively small net effect computed in models (2) and (4) of Table 6, indicated with "L"); ii) and that as long as the demand patterns and numbers of international tourist arrivals compel islands to import consumables/merchandises, the resulting net effect on economic growth would also be positive, but statistically greater (see also a relatively high net effect computed in models (2) and (4) of Table 6, indicated with "H"). Taking cue from these particular empirical observations, we intuitively advise islands to begin employing additional workable strategies, other than the mere serving of imported consumables/merchandises within their tourism industries, to increase international tourist arrivals, while allowing their numbers and demand patterns to naturally necessitate the imports of supplementary consumables/merchandises, if the need be. For this reason, even as we acknowledge the complementary impact of international tourist arrivals and merchandise imports on economic growth, coupled with the empirical evidence in support of a bi-causal relationship between them, national efforts and policies to continuously increase the former ought to be prioritized in island economies, while gradually weaning themselves from merchandise import to feed their tourism sector.

Expounding further the interactive results, the findings from this study further reveal that the interplay of tourism expansion (influx of international tourists) and merchandise imports leads to a significant positive net effect on economic growth among islands across the globe. Relying on the resulting net effects obtained from the partial differentiation of Equation (4), the combined net effects of the two variables of interest on economic growth proved not detrimental (see models (2) and (4) in Table 6, and notes under Table 6 for mathematical computations of net/marginal effects). Precisely, results from models (2) and (4) in Table 6 show that the net effect of tourism expansion, conditioned on merchandise imports, and vice versa, on the islands' economic growth,

are both significantly positive. This indicates that the mere feeding of the tourism industry (international tourists) with imported merchandises may not necessarily yield detrimental impacts on economic growth among islands. Similarly, moderately inducing international tourist arrivals by abstemiously importing and serving foreign consumables/tradable goods within the local tourism industry may also not necessarily be detrimental to the economic growth prospects of these islands. Following this new insight, we precisely conclude that economic growth of islands would not be compromised when tourism expansion and merchandise imports are concurrently pursued within the rightful and accommodative levels.

Furthering our investigations into the economic growth implications of over-reliance on both tourism and merchandise imports by islands, our study documents surprising results. Right from onset, results from models (3) and (4) in Table 7, and models (2) and (3) in Table 8 respectively reveal that islands that over-rely on merchandise imports and over-specialise in tourism record significant lower economic growth patterns than their counterparts. This is so because the coefficients of the dichotomous variables capturing over-reliance on both international tourist arrivals and imported merchandises recorded significant reductive effects on economic growth (see models (3) and (4) of Table 7, and models (2) and (3) of Table 8). This particular observation is partly congruent with the findings of Bojanic and Lo (2016) who empirically postulated that "small island developing states (SIDS)" who overly rely on their tourism industries tend to experience negative economic growth patterns.

[Insert Table 7 Here]

Surprisingly, the observed significant conditional reductive effect that over-reliance on merchandise imports has on economic growth, however, begins to decline as islands channel merchandise imports to support the increasing demand within their tourism industries. This is evident as the conditional effects of international tourist arrivals, and the interaction terms, on economic growth, in model (4) of Table 7, and model (2) of Table 8, are all significantly positive. Similarly, the observed significant reductive effect of over-specialisation in tourism on economic growth, also, experiences a decline as islands begin to import merchandises to sustain their tourism industries. Again, this is evident as the conditional effects of imported merchandises, and the interaction terms, on economic growth, in model (2) of Table 8, are all significantly positive.

In order to widen the argument by computing the combined net effects for further analyses, we, again, partially differentiate Equations (5) and (6), taking into consideration the variables of interest (see below Tables 7 and 8 for mathematical computations of net/marginal effects). Concisely, results from models (2) and (4) of Table 7 suggest that over-reliance on the import of merchandises/consumables/tradable goods for the sake of international tourists leads to a significant negative net effect on the economic growth of islands within our sample (notice that the computed net effect of HMI on G, dependent on TR, is negative, in Table 7). Likewise, results displayed in models (2) and (4) of Table 8 imply that island economies that over-specialise (over-depend on) in tourism, with the assistance of imported merchandises/consumables/tradable goods, tend to record

significant negative net effects in economic growth (notice also that the computed net effect of HTD on G, dependent on MI, is negative, in Table 8).

[Insert Table 8 Here]

Our observations tend to suggest that although arrival of international tourists may elicit some levels of significant positive growth, attempts to sustain the industry by overly relying on imported merchandises/consumables/tradable goods totally eats up the fortunes, and runs such island economies into negative growth patterns. Similar to this, islands that sustain uncontrolled expansion in international tourist arrivals with imported merchandises/consumables/tradable goods stand the risk of experiencing significant negative economic growth patterns. Put differently, the results postulate that the significant positive contributions of international tourist arrivals and merchandise imports towards the economic growth of islands are entirely wiped off if such sovereign states respectively compound their economic patterns with overreliance on merchandise imports and over-specialisation in tourism expansion. Although our empirical findings are unique, they partly confirm earlier projections from Milne (1992, 1990) and Archer (1982) who highlighted the possibility of such observations resulting from relatively huge levels of monetary leakages suffered by island economies through the process of over-relying on foreign merchandises/tradable goods, and thus, leaving the incomes of locals relatively meagre compared to the total national rewards from the tourism sector. Interestingly, Sinclair-Maragh and Gursoy (2015) and Baidoo et al. (2021) described this very scenario as "economic imperialism" in the cases of Jamaica, and among islands within sub-Saharan Africa, respectively.

In addition to the above empirical results recorded in Tables 5 through 8, we also observed that increment in FDI, real effective exchange rates and national expenditures consistently and significantly promotes economic growth among global islands. However, trade openness and financial development were consistently observed to have significant negative effect on economic growth among global islands. These observations are partly consistent with our expectations and existing literature. For instance, following the traditional theories of international trade, results from this study confirm that higher levels of real effective exchange rates among the islands significantly trigger higher levels of economic growth, which is consistent with the findings of Tang et al. (2019) in the case of Mauritius, and Iamsiraroj (2016), and Naude and Saayman (2005).

6. Conclusion and Policy Implications

Employing fixed and random effects estimation techniques on five-year-non-overlapping-averaged data, covering the years 1980 through to 2019, this study empirically establishes evidence that there exists a significantly positive bi-causal relationship between international tourist arrivals and consumables/merchandises imports among 45 sovereign islands across the globe. Also, we observed that a silo (a conditional independent) increase in international tourist arrivals and consumables/merchandises imports exerts a significant reductive (negative) effect on the economic growth of the islands. This notwithstanding, a moderate simultaneous

pursuit of expansion in international tourist arrivals and consumables/merchandises imports is observed to result in a complementary positive net effect on economic growth among the islands. Surprisingly, islands that over-rely on tourism as an economic sector, as well as those that over-rely on imported merchandises, tend to experience relatively lower economic growth, compared to their counterparts. Broadening the argument, further investigations reveal that overly relying on imported merchandises for the sake of international tourists, as well as overly specialising in the tourism sector, with the assistance of imported merchandises, both result in significant negative net effects on the economic growth of islands across the globe.

The findings of the study elicit a number of recommendations for islands across the globe on their pursuit for tourism expansion and specialisation agenda. Firstly, we advise academics, governments, and policy-makers that the general claim and economic projection that feeding international tourists with imported consumables and merchandises outrightly impedes economic growth is entirely dismissed, at least in the case of islands across the globe. Secondly, although we acknowledge how naturally difficult it is for most islands to wean their economies from tourism specialisation, and the imports of consumables and merchandises, the findings of this study, however, warn against over-reliance on these approaches in attempt to spur economic growth. For this reason, governments of islands are admonished to make deliberate efforts to boost local production of consumables and merchandises that meet the standards of international tourists. This primarily calls for deliberate efforts to add value to the local agricultural products to the very standards required by the local tourism industries. Following the recommendations of Baidoo et al. (2021), the local production value chain, from agriculture (foodstuffs, fisheries, just to mention a few) through to manufacturing, of islands across the globe ought to be "tourism-focused" in order to "maximise", "retain" and "prudently disperse" the economic benefits of the industry among local indigenes. We, therefore, propose "tourism-focused agriculture", "tourism-focused human development" and "tourism-focused local manufacturing" for islands across the globe.

Connected to the above recommendations, global islands are admonished to equitably allocate their natural resources, especially lands and human capital, giving priority to sectors such as agriculture and local food production. There is also the need for an empirically-backed balance, and strategies towards the expansion of the tourism industries, and other sensitive sectors that are key to the supply of food and manufactured products among these islands. More specifically, we encourage islands to make deliberate efforts to expand local food production in order to reap maximum economic benefits from their major long-standing priority of continually expanding their tourism industries.

Indeed, islands across the globe ought to be cautious about how opened their economies are to international trade, given that results from this study consistently project trade openness to be significantly detrimental to economic growth. More intuitively, the results provide empirical evidence alluding to the fact that island economies prefer importing foreign tradable goods with almost every available funding opportunity. As a confirmation, it not surprising that access to local and foreign finance by private sectors (including tourism) in these islands tends to expose their economies to greater

international trade activities (see that financial development and FDIs significantly promote merchandise imports in Table 5), and perhaps, serves as the route through which their economic fortunes are leaked, and consequently leading to negative economic growth. A potential aggravating syndrome emanates from the fact that increments in national expenditures among global islands also significantly promotes merchandise imports (see Table 5). Ultimately, island economies ought to redirect such financing and spending opportunities into creating more integrated economic systems that thrive materially on needs-based productivity, self-sufficiency and self-reliance.

By way of directing future related studies, there is the need for additional empirical works that seek to unearth the optimal combination of tourism development and merchandise imports that would trigger maximum economic growth among islands. Also, future studies could attempt to unravel additional potential paths through which tourism expansion and merchandise imports exert detrimental effects on economic growth among islands economies.

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Table 1: Statistical comparisons of "decade-on-decade" trends and difference in means for International Tourist Arrivals (Tourism), Merchandise Imports, and Economic Growth on Global Islands.

Variables	**Decades/Time**								
	2010-2019	**2000-2009**	***t*-score (sig)**	**2000-2009**	**1990-1999**	***t*-score (sig)**	**1990-1999**	**1980-1989**	***t*-score (sig)**
Tourism Variables									
International tourism, number of arrivals	1,866,693.88	1,238,897.59	**4.7748 (0.0000)**	1,238,897.59	923,566.15	**3.4257 (0.0007)**	923,566.15	*No Data*	**N/A N/A**
International tourism, receipts (current US$)	1,939.983*M*	1,023.539*M*	**3.6088 (0.0003)**	1,023.539*M*	741.901*M*	**3.2641 (0.0013)**	741.901*M*	*No Data*	**N/A N/A**
International tourism receipts, per tourist (current US$)	1,136.497	822.3253	**3.9778 (0.0001)**	822.3253	773.4861	**2.8562 (0.0039)**	773.4861	*No Data*	**N/A**
Merchandise Import Variables									
Food imports (% of merchandise imports)	19.79	16.78	**3.1526 (0.0012)**	16.78	18.34	**-2.8698 (0.0029)**	18.34	18.67	**-2.0098 (0.0250)**
Merchandise imports (current US$)	13,597.186*M*	8,257.743*M*	**2.0033 (0.0241)**	8,257.743*M*	4,248.241*M*	**2.4222 (0.0088)**	4,248.241M	2,002.132*M*	**2.0031 (0.0242)**
Economic Growth Variables									
GDP growth rate (%)	3.028	3.038	**-0.0287 (0.9771)**	3.038	3.521	**-1.2015 (0.2312)**	3.521	2.927	**1.2120 (0.2273)**
GDP per capita growth rate (%)	1.722	1.641	**0.2432 (0.8082)**	1.641	2.054	**-1.0425 (0.2987)**	2.054	1.414	**1.2558 (0.2111)**

Source: Authors' with WDI data, 2021. *M* = million; "No Data" means there were no data for the variables within such decade; N/A = Not applicable. *t*-statistics with their respective significance levels are in bold, with *p*-values in brackets. We statistically compare, on decade basis, the difference in mean for tourism, merchandise imports, and economic growth variables. The study employed the two-tail paired *t*-test, with null hypothesis that the differences in the means of the variables are equal to zero (Ho: Mean from Current Decade's data – Mean from Immediate Past Decade's data = 0).

Table 2: Summary of Variables

Variable Name	Symbols	Definition of variables	Data Source	Expected Effect
Merchandise Imports	$lnMI_{i,t}$	Natural log of the value of Imported Merchandises (in current US$).	World Development Indicators (WDI)	+/-
Economic Growth	$EG_{i,t}$	We employ two standard proxies for Economic growth: GDP growth rate, and GDP per capita growth rate, both from 2010 constant local currency.	World Development Indicators (WDI)	+/-
Tourism	$lnTA_{i,t}$	Natural log of International Tourism, Number of Arrivals.	Generated by authors from data derived from WDI	+
Tourism × Merchanise Imports	$lnTA_{i,t} \times lnMI_{i,t}$	Interaction between merchandise imports, and international tourism, number of arrivals.	Generated by authors from data derived from WDI	+/-
High Tourism Dependent Islands – Dummy	HTA_i	HTA_i is a dummy variable that takes "1" for tourism-dependent islands, and "0" otherwise.	Generated by authors from data derived from WDI	-
High Tourism Dependent Islands - Dummy × Merchandise Imports	$HTA_i \times lnMI_{i,t}$	Interaction between HTA_i and $lnMI_{i,t}$ (measures high-tourism-dependence conditional effects of merchandise imports on economic growth).	Generated by authors from data derived from WDI	+/-
High Merchandise Importing Islands - Dummy	HMI_i	HMI_i is a dummy variable that takes "1" for islands that depend heavily on imported merchandises, and "0" otherwise.	Generated by authors from data derived from WDI	-
Tourism × High Merchandise Importing Islands - Dummy	$lnTA_{i,t} \times HMI_i$	Interaction between $lnTA_{i,t}$ and HMI_i (measures high-imported-merchandise-dependence conditional effects of tourism on economic growth).	Generated by authors from data derived from WDI	+/-

Table 2: Continued

Variable Name	Symbols	Definition of variables	Data Source	Expected Effect
Foreign Direct Investments	$FDI_{i,t}$	It is the sum of the nets of equity capital, reinvestment of earnings, other long-term capital, and short-term capital, scaled by GDP.	World Development Indicators (WDI)	+
Real Effective Exchange Rate	$ER_{i,t}$	It measures prices of goods and services in U.S. dollar relative to prices at home. We compute it as nominal effective exchange rate divided by a price deflator or index of costs, in constant 2010 terms, expressed as national currency units per U.S. dollar.	World Development Indicators (WDI)	+/-
Financial Development	$FD_{i,t}$	This refers to financial resources provided to the private sector by financial corporations through loans, and trade credits and other accounts receivables, which establish liabilities, all scaled by GDP.	World Development Indicators (WDI)	+/-
Trade Openness	$TO_{i,t}$	Sum of Imports and exports of goods and services received from and delivered to the rest of the world by a particular country, all scaled by GDP.	Generated by authors from data derived from WDI	+/-
National Expenditures	$NE_{i,t}$	Gross national expenditure is the sum of household final consumption expenditure, general government final consumption expenditure, and gross capital formation, all scaled by GDP.	World Development Indicators (WDI)	+

Source: Authors' with WDI 2021 data.

Table 3: Descriptive Statistics

Variable Name	Obs.	Units	Mean	Std. Dev.	Min	Max	SWILK	VIF
Merchandise Imports	346	Current US$	7,090M	32,200M	3.4M	361,000M	0.0038	3.91
Tourism	209	Number of Int'l Arrivals	1,426,463.00	2,527,682.00	1,000.00	17.3M	0.0004	3.8
GDP Growth Rate	337	Percentage	3.13	2.75	-7.88	17.93	0.0025	2.51
GDP per Capita Growth Rate	337	Percentage	1.71	2.72	-8.45	13.68	0.0000	2.27
High Tourism Dependent Islands - HTA_i	218	Dummy	0.22	0.41	0.00	1.00	0.0010	2.05
High Merchandise Importing Islands -HMI_i	233	Dummy	0.38	0.49	0.00	1.00	0.7598	1.93
Foreign Direct Investments	320	Percentage	6.70	19.02	-6.32	267.61	0.0000	1.88
Real Effective Exchange Rate	278	Local currency units per U.S. dollar	2.04	10.75	0.00	157.21	0.0000	1.87
Financial Development	283	Percentage	42.51	35.11	1.33	247.06	0.0000	1.43
Trade Openness	285	Percentage	2.04	10.75	0.00	157.21	0.0000	1.4
National Expenditures	231	Percentage	108.94	22.03	54.00	233.77	0.0000	1.22

Source: Authors' with WDI 2021 data. Note: M = million. Values reported under **SWILK** are the *p-values* for Shapiro–Wilk test for normality. Conventionally, we reject null hypothesis (*Ho: The variables are normally distributed*). **VIF** refers to variance inflation factor, a measure of multicollinearity, and with a mean of 2.21.

Table 4: Correlation matrix, and Fisher-type Panel Unit-Root Test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Stationarity Test (in levels) *(p-value)*	Stationarity Test (in △) *(p-value)*
(1) Merchandise Imports	1									1.0000	0.0000
(2) Tourism (No. of Arrivals)	0.849***	1								1.0000	0.0000
(3) GDP Growth	0.172***	0.192***	1							0.0000	0.0000
(4) GDP per capita Growth	0.148***	0.174***	0.916***	1						0.0000	0.0000
(5) Foreign Direct Investments	0.176***	0.196***	0.007	0.032	1					0.0000	0.0000
(6) Real Effective Exchange Rate	-0.098	-0.153***	-0.031	-0.103*	-0.048	1				0.0003	0.0000
(7) Financial Development	0.513***	0.529***	-0.008	0.041	0.459***	-0.229***	1			0.8598	0.0000
(8) Trade Openness	0.327***	0.296***	0.244***	0.215***	0.289***	-0.1728***	0.338***	1		0.0000	0.0000
(9) National Expenditures	-0.546***	-0.646	-0.140	-0.082	-0.0914	0.0920	-0.300***	-0.2177***	1	0.0000	0.0000

Source: Authors' with WDI 2021 data. Note: ***, **, and * represent significance at 1%, 5% and 10 %, respectively. We follow Choi (2001) and report the *p-values* for the inverse chi-sqaured of the Fisher-type test for stationarity in levels, and in first difference (△).

Table 5: Bi-Causal relationship between International Tourist Arrivals and Merchandise Imports Among Global Islands

Dependent Variable	Tourism (No. of Arrivals)	Merchandise Imports
	(1)	(2)
Tourism (No. of Arrivals)		0.8468***
		(0.0586)
Merchandise Imports	0.8410***	
	(0.0612)	
Foreign Direct Investments	-0.0172***	0.0064*
	(0.0052)	(0.0037)
Real Exchange Rate	0.0155	-0.0394**
	(0.0226)	(0.0200)
Trade Openness	-0.0017	0.001
	(0.0015)	(0.0014)
National Expenditures	-0.0056	0.0056*
	(0.0034)	(0.0033)
Financial Development	0.0009	0.0032**
	(0.0016)	(0.0015)
Controlled for Continental Dummies	Yes	Yes
Obs.	180	180
R^2	0.4591	0.7357
Hausman Test (*p-value*)	0.0219	0.0821
No. of Islands	41	41

Note: Standard errors in parentheses. ***, **, and * represent significance at p-value < 0.01, p-value < 0.05, and p-value < 0.1, respectively. Model (1) was estimated using FE technique, whereas model (2) was estimated using RE technique, following the Hausman Test results presented in Appendix I.

Table 6: Moderating role of Merchandise Imports and International Tourist Arrivals on Economic Growth Among Global Islands

Dependent Variable	GDP Per Capita Growth	GDP Per Capita Growth	GDP Growth	GDP Growth
	(1)	(2)	(3)	(4)
Tourism (No. of Arrivals)	0.1529	2.3792*	0.1234*	-0.4815**
	(0.3012)	(1.2613)	(0.0722)	(0.2171)
Merchandise Imports	0.4958*	2.1487**	0.6751***	0.3186**
	(0.2748)	(0.9494)	(0.0718)	(0.1393)
Tourism × Merchandise Imports		-0.1135*		0.0278***
		(0.0625)		(0.0095)
Foreign Direct Investments	-0.005	-0.0062	0.0005	0.0007
	(0.0085)	(0.0084)	(0.0035)	(0.0033)
Real Exchange Rate	-0.0781	-0.0718	0.0450***	0.0374***
	(0.0560)	(0.0554)	(0.0142)	(0.0138)
Trade Openness	0.0034	0.006	-0.0039***	-0.0035***
	(0.0043)	(0.0045)	(0.0009)	(0.0009)
National Expenditures	0.0297**	0.0309***	0.0005	0.0001
	(0.0120)	(0.0119)	(0.0022)	(0.0021)
Financial Development	-0.0162**	-0.0157**	-0.0003	-0.0006
	(0.0080)	(0.0079)	(0.0010)	(0.0010)
Net effect of TR on G, dependent on MI		0.0744 [L]		0.0830 [L]
Net effect of MI on G, dependent on TR		0.7099 [H]		0.6710 [H]
Controlled for Continental Dummies	Yes	Yes	Yes	Yes
Obs.	180	180	180	180
R^2	0.2716	0.3026	0.2561	0.2576
Hausman Test (*p-value*)	0.7016	0.7633	0.0000	0.0000
No. of Islands	41	41	41	41

Note: Standard errors in parentheses. ***, **, and * represent significant at p-value < 0.01, p-value < 0.05, and p-value < 0.1, respectively. Models (1) and (2) were estimated using RE technique, whereas models (3) and (4) was estimated using FE technique, following results of the Hausman test presented in Appendix I. TR = Tourism; MI = Merchandise Imports; G = Economic Growth. With the interaction models, we follow Brambor et al. (2006) and compute the "net or marginal effects", by using averages of the natural logs of international tourist arrivals and merchandise imports, respectively obtained from the full sample as 12.68 and 20.31. Eg. in model (2) above [G = a.T + b.MI + c.(T x MI)], we $\partial G/\partial MI$ = b + c (TR) = 2.1487 + (-0.1135 x 12.67683) = 0.7099. Likewise, in model (4) above, [G = a.T + b.MI + c.(T x MI)], we $\partial G/\partial T$ = a + c (MI) = -0.4815 + (0.0278 x 20.30634) = 0.0830. The "L" and "H" respectively denote statistically significant "Low" and "High" computed marginal effects following Cohen, Cohen, West and Aiken's (2003) test of significance of difference between two slopes.

Table 7: How Overreliance on Imported Merchandises to Feed Int'l Tourists Impacts Economic Growth Among Global Islands

Dependent Variable	GDP Per Capita Growth	GDP Per Capita Growth	GDP Growth	GDP Growth
	(1)	(2)	(3)	(4)
Tourism (No. of Arrivals)	0.6669***	1.0394***	0.2465***	0.2516***
	(0.0545)	(0.3746)	(0.0308)	(0.0300)
HMI	0.2405*	9.9804**	-0.0091	-0.6464**
	(0.1332)	(4.7924)	(0.0447)	(0.2811)
Tourism × HMI		-0.7938**		0.0490**
		(0.3919)		(0.0214)
Foreign Direct Investments	0.0094**	-0.0051	0.0049*	0.0045*
	(0.0045)	(0.0087)	(0.0026)	(0.0026)
Real Exchange Rate	0.0007	-0.0807	0.0179	0.0188*
	(0.0186)	(0.0586)	(0.0109)	(0.0106)
Trade Openness	-0.0028**	0.0033	-0.001	-0.0008
	(0.0013)	(0.0047)	(0.0007)	(0.0007)
National Expenditures	0.0109***	0.0313**	0.0004	0.0003
	(0.0029)	(0.0128)	(0.0017)	(0.0017)
Financial Development	0.0012	-0.0150*	0.0006	0.0007
	(0.0014)	(0.0080)	(0.0008)	(0.0008)
Net effect of HMI on G, dependent on TR		-0.0825		-0.0252
Controlled for Continental Dummies	Yes	Yes	Yes	Yes
Obs.	262	262	262	262
R^2	0.3262	0.253	0.3236	0.3455
Hausman Test (*p-value*)	0.7015	0.7046	0.0001	0.0000
No. of Islands	41	41	41	41

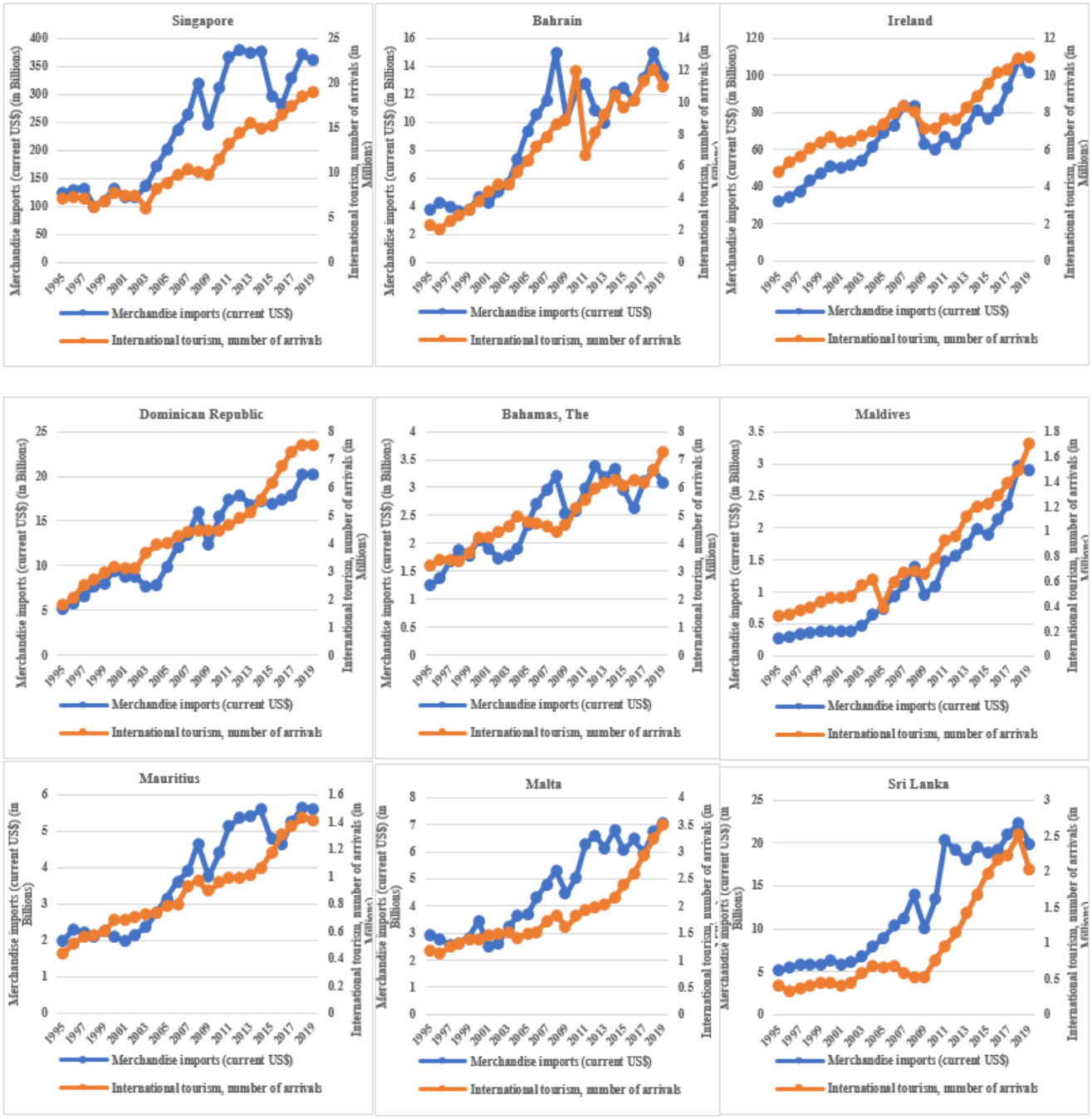
Note: HMI denotes high merchandise importing islands, which is a dummy variable that takes "1" for islands that depend heavily on imported merchandises, and "0" otherwise; Standard errors in parentheses. ***, **, and * represent significant at p-value < 0.01, p-value < 0.05, and p-value < 0.1, respectively. Models (1) and (2) were estimated using RE technique, whereas models (3) and (4) were estimated using FE technique, following results of the Hausman test presented in Appendix I. TR = Tourism; MI = Merchandise Imports; G = Economic Growth; HMI = High Merchandise Import Dependence (dummy variable). With the interaction models, we follow Brambor et al. (2006) and compute the "net or marginal effects", by using average of the natural log of international tourist arrivals given as 12.67683. Eg. in model (4) above [G = a.T + b.HMI + c.(T x HMI)], we ∂G/∂HMI = b + c (TR) = -0.6464+(0.049 x 12.67683) = -0.0252. In model (2), we compute 9.9804 + (-0.7938 x 12.67683) = -0.0825.

Table 8: How Over-Tourism reacts with Imported Merchandises to Impact Economic Growth Among Global Islands

Dependent Variable	GDP Per Capita Growth	GDP Per Capita Growth	GDP Growth	GDP Growth
	(1)	(2)	(3)	(4)
Merchandise Imports (MI)	0.6095***	0.4492**	0.6646***	0.7224***
	(0.1820)	(0.1821)	(0.0430)	(0.0530)
HTD Islands	-0.5949	-13.5506**	-1.7796***	1.3019**
	(0.7733)	(5.7176)	(0.3894)	(1.7994)
HTD Islands × MI		0.6397**		-0.1467*
		(0.2793)		(0.0836)
Foreign Direct Investments	-0.0042	-0.0057	0.000013	0.0001
	(0.0085)	(0.0080)	(0.0028)	(0.0028)
Real Exchange Rate	-0.066	-0.0712	0.0117	0.0015
	(0.0589)	(0.0547)	(0.0155)	(0.0165)
Trade Openness	0.0024	0.0047	-0.0039***	-0.0041***
	(0.0046)	(0.0042)	(0.0011)	(0.0011)
National Expenditures	0.0320**	0.0323***	0.0006	-0.0001
	(0.0126)	(0.0117)	(0.0025)	(0.0025)
Financial Development	-0.0171**	-0.0142*	0.0004	-0.0001
	(0.0081)	(0.0078)	(0.0012)	(0.0012)
Net effect of HTD on G, dependent on MI		-0.5606		-1.6770
Controlled for Continental Dummies	Yes	Yes	Yes	Yes
Obs.	265	265	265	265
R^2	0.2741	0.3343	0.6201	0.623
Hausman Test (*p-value*)	0.6018	0.5867	0.5233	0.6211
No. of Islands	41	41	41	41

Note: HTD denotes high tourism dependent islands, which is also a dummy variable that takes "1" for tourism-dependent islands, and "0" otherwise. Standard errors in parentheses. ***, **, and * represent significant at p-value < 0.01, p-value < 0.05, and p-value < 0.1, respectively. Models (1) through (4) were estimated using RE technique, following results of the Hausman test presented in Appendix I. TR = Tourism; MI = Merchandise Imports; G = Economic Growth; HTD = High Tourism Dependence (dummy variable). With the interaction models, we follow Brambor et al. (2006) and compute the "net or marginal effects", by using average of the natural log of merchandise imports given as 20.30634. Eg. in model (2) above [G = a.MI + b.HTD + c.(MI x HTD)], we $\partial G/\partial HTD$ = b + c (MI) = -13.5506 + (0.6397 x 20.30634) = -0.5606. In model (4), we compute 1.3019 + (-0.1467 x 20.30634) = -1.6770.

Figure 1: Co-movements between international tourism-number of arrivals, and value of merchandise import (current US$), for some selected sovereign islands



Source: Authors' with World Development Indicators (WDI) 2021 data.

Appendix I: Hausman Test – Fixed verses Random effects estimation techniques

Test	Null Hypothesis
Fixed effects	H_0: Difference in coefficients not systematic chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B) =29.47 Prob>chi2 = 0.0000
Random effects	H_0: Difference in coefficients not systematic chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B) =3.70 Prob>chi2 = 0.6018

Appendix II: Panel cointegration test between international tourist arrivals, and merchandise imports.

Cointegration Tests		**In Levels**		**In first differences**	
		Statistics	**p-values**	**Statistics**	**p-values**
Pedroni	Panel-MPP	-0.3865	0.3496	-14.5096	0.0000
	Panel-PP	-1.0415	0.1488	-21.9580	0.0000
	Panel-ADF	-0.7254	0.2341	-1.576e+15	0.0000
Kao	Panel-MDF	0.5682	0.2849	-28.5649	0.0000
	Panel-DF	-0.2398	0.4052	-23.9959	0.0000
	Panel-ADF	-0.2789	0.3902	-18.3069	0.0000
Westerlund	t	-2.1116	0.0174	-6.8254	0.0000

Note: For Pedroni's (1999, 2004) and Kao's (1999) tests, Ha: All panels are cointegrated. For Westerlund's (2005) test, Ha: Some panels are cointegrated.

Appendix III: Sampled list of sovereign islands across the globe

Country	World Bank Country Code	Country	World Bank Country Code
Antigua and Barbuda	ATG	Maldives	MDV
Bahamas, The	BHS	Malta	MLT
Bahrain	BHR	Marshall Islands	MHL
Barbados	BRB	Mauritius	MUS
Belize	BLZ	Nauru	NRU
Brunei Darussalam	BRN	New Zealand	NZL
Cape Verde	CPV	Palau	PLW
Comoros	COM	Papua New Guinea	PNG
Cuba	CUB	Ireland	IRL
Cyprus	CYP	St. Kitts and Nevis	KNA
Dominica	DMA	St. Lucia	LCA
Dominican Republic	DOM	St. Vincent and the Grenadines	VCT
Timor-Leste	TLS	Samoa	WSM
Micronesia, Fed. Sts.	FSM	Sao Tome and Principe	STP
Fiji	FJI	Seychelles	SYC
Guinea-Bissau	GNB	Singapore	SGP
Grenada	GRD	Solomon Islands	SLB
Guyana	GUY	Sri Lanka	LKA
Haiti	HTI	Tonga	TON
Iceland	ISL	Trinidad and Tobago	TTO
Jamaica	JAM	Tuvalu	TUV
Kiribati	KIR	Vanuatu	VUT
Madagascar	MDG		