African Review of Economics and Finance | ISSN 2042-1478 | Volume X| Issue X | Date

An empirical insight into the international tourism – foreign direct investment nexus in Africa

Olufemi Adewale Aluko

Department of Finance, University of Ilorin, P.M.B 1515, Ilorin, Kwara State, Nigeria.
Email: olufemiadewale6@gmail.com

Abstract

This study examines the international tourism-foreign direct investment (FDI) nexus in Africa. To do this, it investigates the causal relationship between international tourism and FDI in a panel dataset of 43 African countries for the period 1995-2016. Using the Dumitrescu and Hurlin (2012) panel Granger non-causality test which is robust to cross-sectional dependence, this study finds a homogeneous unidirectional causality from FDI to international tourism in Africa. Also, it finds causality between international tourism and FDI in at least one direction in majority of the countries. Policy implications are documented in this study.

Keywords: International tourism; FDI; Panel Granger non-causality test; Africa.

JEL classification: F21; L83; O55

Article history:
Received: 10th January, 2020
Accepted: 5th May, 2020
Handling editor: Muazu Ibrahim (PhD)

1. Introduction

In a layman's view, globalization is the interrelationship among world economies. A broader view provided by Norris (2000, p. 155) describes globalization as 'a process that erodes national boundaries, integrates national economies, cultures, technology and governance, and produces complex relations of mutual interdependence'. International tourism and foreign direct investment (FDI) are key elements in the globalization process. International tourism entails the movement of people, often regarded as residents/citizens, of a country (home country) to another country (host country) for personal, leisure, or business reasons.[1] The Organisation for Economic Co-operation and Development (OECD) refers to FDI as a form of cross-border investment made by a resident (the direct investor) of a country with the aim of establishing a lasting interest, usually at least 10% ownership stake, in a firm operating in a country other than that of the direct investor (OECD, 2008).

Similar to FDI, international tourism is crucial for economic development (see Lee & Brahmasrene, 2013; Holzner, 2011; Kim, Chen, & Jang, 2006). For host countries, international tourism and FDI offer potentials for employment generation, foreign exchange earnings, human capital development, and increased access to global markets. The United Nations for Conference on Trade and Development (UNCTAD) argues that FDI is one of the channels through which developing countries can harness the capital, infrastructure, knowledge, and access to global marketing networks which are crucial elements of international tourism (UNCTAD, 2007). Endo (2006) presumes that many developing countries lacking capital and access to global marketing networks can compensate for their shortcomings through FDI. International tourism as an experience-making industry distinctively stimulates FDI inflows (Li, Huang, & Song, 2017). International tourism can promote FDI by permitting investors to travel to other countries to source for exploitable investment opportunities which are seldom known to them without visitations.

In the empirical literature, the nexus between international tourism and FDI has been keenly debated for more than a decade. A group of empirical studies (Perić & Radić, 2016; Tomohara, 2016) believes that FDI cause international tourism, while another group (Tang, Selvanathan, & Selvanathan,

[1] UNCTAD (2007) identifies tourism as the largest industry in world which connects an agglomeration of many far-reaching and cross-cutting activities that include accommodation, transport, food and beverage services, health services, financial services, telecommunication, sports and recreation, cultural entertainment, conventions and trade fairs etc.

2007; Sanford & Dong, 2000) supports that FDI is caused by international tourism. A third group (Arain, Han, Sharif, & Meo, 2019; Fereidouni & Al-mulali, 2014; Selvanathan, Selvanathan, & Viswanathan, 2012; Craigwell & Moore, 2008) argues that international tourism and FDI cause each other. Despite the considerable empirical attention on the international tourism-FDI nexus, there is a noticeable dearth of empirical documentation in the African context. Hitherto, extant empirical studies in Africa, for the most part, have focused on the determinants of FDI (Ibrahim, Adam, & Sare, 2019; Anyanwu, 2012), determinants of international tourism (Adeola & Evans, 2019; Viljoen, Saayman, & Saayman, 2019; Adeola, Boso, & Evans, 2018), FDI-economic growth nexus (Opoku, Ibrahim, & Sare, 2019; Acquah & Ibrahim, 2019), and international tourism-economic growth nexus (Tugcu, 2014; Fayissa, Nsiah, & Tadasse, 2008). Understanding the international tourism-FDI nexus in Africa would inform policymakers on whether stimulating FDI inflows can boost the continent's tourism development and/or developing the tourism industry would induce FDI inflows into Africa.[2]

Owing to the aforementioned, this study aims to provide empirical insight into the nexus between international tourism and FDI in Africa. Overtly, to my best knowledge, the novel contribution of this study is that it is the first to conduct research on the causality between international tourism and FDI using a panel consisting of African countries. The efficiency of causality tests is higher in panel data models compared to time series models due to increased number of observations and degrees of freedom (Hurlin & Venet, 2001).

The rest of this empirical note is sectioned as follows. Section 2 is the next section which describes the data, empirical strategy and preliminary analyses. Section 3 is the penultimate section which discusses the empirical results. Finally, Section 4 provides the conclusion and policy implications.

2. Data, empirical strategy and preliminary analyses

2.1. Data

This study uses a panel dataset for 43 out of 54 countries in Africa over the period 1995-2016. The criterion for selecting the countries included in the panel is the availability of exploitable data. Data on international tourism receipts (ITR) in current US dollar and FDI net inflows in current US dollar, extracted

[2] Tourism development in Africa is subpar despite the continent's huge potential for tourism. Also, FDI inflows into Africa is relatively low in comparison with other continents.

from World Bank's World Development Indicators (WDI) database, represent international tourism and FDI, respectively.[3]

2.2. Empirical strategy

To detect the causality between international tourism and FDI, this study applies the Dumitrescu and Hurlin (2012) Granger non-causality test for heterogeneous panel data models with fixed coefficients. The imposition of parameter homogeneity in autoregressive panel models may lead to misleading results (Pesaran & Smith, 1995). The Dumitrescu and Hurlin (2012) panel Granger non-causality test is not preconditioned by the presence of cointegration, thus eliminates the need to test for cointegration. The test takes into account two dimensions of heterogeneity: the heterogeneity of the causal relationship and the heterogeneity of the regression model used for testing for causality. Dumitrescu and Hurlin (2012) propose a block bootstrapping procedure which corrects the empirical critical values of the panel Granger non-causality test in order to deal with the cross-sectional dependence.[4] This study considers a bivariate Vector autoregressive (VAR) model, following Dumitrescu and Hurlin (2012):

$$ITR_{i,t} = \partial_{1i} + \sum_{k=1}^{K} \alpha_{1i}^{(k)} ITR_{i,t-k} + \sum_{k=1}^{K} \beta_{1i}^{(k)} FDI_{i,t-k} + \varepsilon_{1i,t}; i = 1,2,\dots,N;\ t = 1,2,\dots,T \quad (1)$$

$$FDI_{i,t} = \partial_{2i} + \sum_{k=1}^{K} \alpha_{2i}^{(k)} FDI_{i,t-k} + \sum_{k=1}^{K} \beta_{2i}^{(k)} ITR_{i,t-k} + \varepsilon_{2i,t}; i = 1,2,\dots,N;\ t = 1,2,\dots,T \quad (2)$$

where *ITR* and *FDI* are stationary variables observed for *N* countries in *T* periods, and ∂_{1i} and ∂_{2i} are country-specific effects assumed to be fixed in the time dimension. The lag order *K* is assumed to be the same for all countries in the panel. The autoregressive parameters ($\alpha_{1i}^{(k)}$, $\alpha_{2i}^{(k)}$) and regression coefficients ($\beta_{1i}^{(k)}$, $\beta_{2i}^{(k)}$) are allowed to vary across countries.

Dumitrescu and Hurlin (2012) propose a Wald statistic which tests the homogeneous non-causality (HNC) hypothesis which states that causality is absent for all countries ($H_0 : \beta_i = 0,\ i = 1,2,\dots N$) against the alternative hypothesis – heterogeneous non-causality (HENC) hypothesis which states that there is causality for at least one country in the panel ($H_1: \beta_i = 0,\ i = 1,2,\dots N_1$; $\beta_i \neq 0,\ i = N_1+1,\ N_1+2,\dots N$). The test statistic is based on averaging standard individual-country Wald statistics of Granger non-causality tests. Under the

[3] The data are rescaled by dividing by 1,000,000.

[4] Due to the high level of economic integration, cross-sectional dependence is a common problem in cross-country panel models. The failure to deal with this problem may lead to imprecise statistical inferences.

HNC hypothesis, the average of the individual-country Wald statistic $W_{N,T}^{HNC}$ is given as:

$$W_{N,T}^{HNC} = \frac{1}{N}\sum_{i=1}^{N} W_{i,T} \tag{3}$$

where $W_{i,T}$ is the individual-country Wald statistic for the i[th] country corresponding to the individual-country Wald test H_0: $\beta_i = 0$. $W_{i,T}$ is identically and independently distributed with finite second order moments. Dumitrescu and Hurlin (2012) note that $W_{i,T}$ converges to a chi-squared distribution with k degrees of freedom under the null hypothesis of HNC.

2.3. Preliminary analyses

It is pertinent to test for cross-sectional dependence in the panel data models as well as the stationarity property of the panel series before proceeding with the Dumistrescu and Hurlin (2012) panel Granger non-causality test.

2.3.1. Cross-sectional dependence test

To investigate the existence of cross-sectional dependence in the panel series, this study employs Pesaran (2004) and Pesaran et al. (2008) cross-sectional dependence (CD) test. Pesaran (2004) CD test is based on averaging the pairwise correlation coefficients of the ordinary least squares (OLS) errors from the regressions of the cross-sectional units in the panel. The test statistic is given as:

$$CD = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\rho_{ij}\right) \rightarrow N(0,1) \tag{4}$$

where T is the time interval, N is number of cross-sectional units, and ρ_{ij} is the pairwise correlation coefficient between cross-sectional units.

Pesaran *et al.* (2008) CD test, which is a bias-adjusted version of the Breusch and Pagan (1980) Lagrange Multiplier (LM) test for cross-sectional independence in errors of a panel model, is used to check for the presence of cross-sectional dependence in the panel model. The test is consistent under error cross-sectional dependence of any fixed order p. The test statistic is as follows:

$$LM_{adj} = \sqrt{\frac{1}{N(N-1)}}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\frac{(T-k)\hat{\rho}_{i,j}^2 - \mu T_{i,j}}{vT_{i,j}} \rightarrow N(0,1) \tag{5}$$

Pesaran (2004) and Pesaran *et al*. (2008) CD tests are asymptotically distributed as standard normal as T→ ∞ first and then N→ ∞ and exhibit satisfactory sample size properties. They both test the null hypothesis of error cross-sectional independence (H_0: Cov ($\varepsilon_{i,t}$, $\varepsilon_{j,t}$) = 0) against the alternative hypothesis of error cross-sectional dependence (H_1: Cov(ε_($\varepsilon_{i,t}$, $\varepsilon_{j,t}$) ≠ 0 for at least one pair of $i \neq j$).

Table 1 presents the results of the cross-sectional dependence tests. The *CD* and LM_{adj} test statistics reject the null hypothesis of error cross-sectional independence in the panel models, thus suggesting that the testing for causality between ITR and FDI under the assumption of error cross-sectional independence is likely to result in spurious causality outcome. Therefore, the decision to use the Dumitrescu and Hurlin (2012) panel Granger non-causality test is justified.

Table 1: Cross-sectional Dependence Test Results

	Without trend	**With trend**
	Model: $ITR_{i,t} = f(FDI_{i,t})$	
CD	27.31(0.000)[a]	11.66 (0.000)[a]
LM_{adj}	86.72(0.000)[a]	79.57(0.000)[a]
	Model: $FDI_{i,t} = f(ITR_{i,t})$	
CD	7.63(0.000)[a]	8.12(0.000)[a]
LM_{adj}	45.17(0.000)[a]	44.32(0.000)[a]

Notes: i. [a] implies rejection of null hypothesis at 1% significance level.
ii. p-values are placed in round brackets.

2.3.2. Stationarity test

The Dumitrescu and Hurlin (2012) panel Granger non-causality test requires the panel series to be stationary, that is, the test is performed with panel series that do not contain unit root. This study utilizes the Pesaran (2007) Cross-sectionally Augmented Dickey-Fuller (CADF) panel unit root test to confirm the stationarity of the panel series. Pesaran (2007) CADF panel unit root test is a second generation panel unit root test which accounts for country heterogeneity and cross-sectional dependence in the panel series. Pesaran (2007) proposes a Cross-sectional ADF (CADF) regression model written as:

$$ITR_{i,t} = \partial_{1i} + \sum_{k=1}^{K} \alpha_{1i}^{(k)} ITR_{i,t-k} + \sum_{k=1}^{K} \beta_{1i}^{(k)} FDI_{i,t-k} + \varepsilon_{1i,t}; i = 1,2,\dots,N;\ t = 1,2,\dots,T \quad (6)$$

where $\overline{Y}_{t\text{-}1} = \frac{1}{N}\sum_{i=1}^{N} Y_{i,t\text{-}1}$ and $\Delta\overline{Y}_t = \frac{1}{N}\sum_{i=1} Y_{i,t}$. The CADF test statistic is calculated by averaging the individual-country CADF test statistics as follows:

$$CADF = \frac{1}{N}\sum_{i=1}^{N} t_i\ (N,T) \quad (7)$$

where $t_i(N,T)$ is the individual CADF test statistic. Under the assumption of cross-sectional dependence, Pesaran (2007) CADF panel unit root test tests the null hypothesis of unit root in the panel series (H_0: $\alpha_i = 0$ for all i) against the alternative hypothesis of unit root in the panel series (H_1: $\alpha_i < 0$ for some $i = 1,\dots,N_1$ and $\alpha_i = 0$ for $i = N_1+1,\dots,N$).

Table 2 reports the panel unit root test results. The CADF test statistic rejects the null hypothesis of unit root in both panel series ($ITR_{i,t}$ and $FDI_{i,t}$) and this indicates that the variables are stationary. Since the variables have been observed to be stationary without any need for differencing their panel series, they are used in their level form for the Dumitrescu and Hurlin (2012) panel Granger causality test.

Table 2: Panel Unit Root Test Results

	Without trend	**With trend**
$ITR_{i,t}$	-4.09(0.000)[a]	-2.325(0.010)[b]
$FDI_{i,t}$	-4.275(0.000)[a]	0.136(0.554)

Notes: i. [a] and [b] imply rejection of null hypothesis at 1% and 5% significance level, respectively.
ii. p-values are placed in round brackets.
iii. Pesaran (2007) CADF panel unit root test is performed with one lag.

3. Empirical results

The optimal lag length of the bivariate panel VAR model for the Dumitrescu and Hurlin (2012) panel Granger non-causality test is decided based on two lag order selection criteria, namely Akaike information criterion (AIC) and Bayesian information criterion (BIC). The optimal lag length is the lag order that minimizes the AIC or BIC. With the maximum lag order for the bivariate panel VAR model automatically set at 5, the optimal lag length selected by the AIC and BIC is 5 and 1, respectively.

The panel and country-specific causality test results obtained from the Dumitrescu and Hurlin (2012) panel Granger non-causality test are displayed in Table 3. The panel causality test results indicate that FDI homogeneously cause international tourism receipts while international tourism receipts does not homogeneously cause FDI, irrespective of the lag order selection criteria. This finding indicates that there is a homogeneous unidirectional causality from FDI to international tourism in Africa, contrary to Craigwell and Moore's (2008) finding of homogeneous bidirectional causality between international tourism and FDI in 21 small island developing states. Unidirectional causality from FDI to international tourism may be elicited by the role of FDI in breeding the development of new tourist centres in host countries, which resultantly leads to increase in the number of tourists visiting the host countries (Craigwell & Moore, 2008). Another argument for the unidirectional causality from FDI to international tourism is provided by Tang *et al.* (2007), who claim that greater

FDI inflows produce a cyclical effect of investigative business and holiday travel and this leads to greater tourism.

The country-specific results based on the AIC exhibit a unidirectional causality from international tourism to FDI in 7 countries (Cameroon, Djibouti, Guinea-Bissau, Sao Tome and Principe, South Africa, Sudan, and Uganda). Unidirectional causality from FDI to international tourism is observed in 11 countries (Angola, Benin, Burundi, Egypt, Ethiopia, Gabon, Gambia, Mozambique, Niger, Senegal, and Seychelles). The causality between international tourism and FDI is bidirectional in Nigeria and Togo only, while there is no causality between international tourism and FDI in the remaining 23 countries. Turning to the BIC-based country-specific results, this study reveal that a unidirectional causality from international tourism to FDI is present in 6 countries (Angola, Burundi, Djibouti, Ethiopia, Guinea-Bissau, and Swaziland) and the unidirectional causality from FDI to international tourism exists in 17 countries (Algeria, Botswana, Comoros, Congo Republic, Ghana, Kenya, Mali, Mauritius, Morocco, Namibia, Niger, Rwanda, Senegal, South Africa, Tanzania, Tunisia, and Zambia). For the remaining 20 countries, there is absence of causality between international tourism and FDI.

An interesting take from this study is that the causality direction between international tourism and FDI is consistent in only 12 countries (Cape Verde, Central African Republic, Côte d'Ivoire, Djibouti, Guinea-Bissau, Lesotho, Madagascar, Malawi, Niger, Senegal, Sierra Leone, and Zimbabwe) under the AIC and BIC, while the causality direction is dissimilar in the remaining 31 countries. Indeed, this suggests that the direction of causality between international tourism and FDI in majority of the countries included in the panel is sensitive to the choice of lag order selection criteria.

TABLE 3: PANEL AND COUNTRY-SPECIFIC CAUSALITY TEST RESULTS

	AIC		
	H0: ITR≠>FDI	**H0: FDI≠>ITR**	**Causality direction**
Panel (All countries)	**9.181(0.390)**	**14.331(0.010)[b]**	**Unidirectional (FDI=>ITR)**
Algeria	10.583(0.194)	9.227(0.238)	No causality (ITR<≠>FDI)
Angola	7.294(0.327)	29.710(0.026)[b]	Unidirectional (FDI=>ITR)
Benin	4.629(0.524)	59.003(0.005)[a]	Unidirectional (FDI=>ITR)
Botswana	5.373(0.458)	9.219(0.239)	No causality(ITR<≠>FDI)
Burundi	1.309(0.919)	17.330(0.081)[c]	Unidirectional (FDI=>ITR)
Cameroon	16.231(0.092)[c]	1.050(0.946)	Unidirectional (ITR=>FDI)
Cape Verde	1.201(0.931)	10.082(0.209)	No causality(ITR<≠>FDI)
Central African Republic	3.337(0.663)	2.287(0.796)	No causality(ITR<≠>FDI)
Comoros	3.756(0.615)	5.641(0.436)	No causality(ITR<≠>FDI)
Congo Republic	9.963(0.213)	4.032(0.584)	No causality(ITR<≠>FDI)
Côte d'Ivoire	2.073(0.824)	9.168(0.241)	No causality(ITR<≠>FDI)
Djibouti	19.799(0.062)[c]	1.226(0.928)	Unidirectional (ITR=>FDI)
Egypt	6.172(0.397)	17.040(0.084)[c]	Unidirectional (FDI=>ITR)
Ethiopia	11.063(0.181)	38.875(0.013)[b]	Unidirectional (FDI=>ITR)
Gabon	2.244(0.801)	15.561(0.099)[c]	Unidirectional (FDI=>ITR)
Gambia	5.289(0.465)	23.694(0.042)[b]	Unidirectional (FDI=>ITR)
Ghana	9.302(0.236)	6.980(0.345)	No causality(ITR<≠>FDI)
Guinea-Bissau	18.533(0.071)[c]	2.047(0.827)	Unidirectional (ITR=>FDI)
Kenya	1.231(0.927)	5.089(0.482)	No causality(ITR<≠>FDI)
Lesotho	4.039(0.583)	11.358(0.173)	No causality(ITR<≠>FDI)
Madagascar	4.440(0.542)	8.885(0.252)	No causality(ITR<≠>FDI)
Malawi	1.497(0.897)	0.602(0.983)	No causality(ITR<≠>FDI)
Mali	1.145(0.936)	5.616(0.438)	No causality(ITR<≠>FDI)
Mauritius	6.267(0.390)	9.167(0.241)	No causality(ITR<≠>FDI)
Morocco	2.449(0.775)	5.175(0.474)	No causality(ITR<≠>FDI)
Mozambique	4.814(0.506)	64.096(0.004)[a]	Unidirectional (FDI=>ITR)
Namibia	12.389(0.150)	15.456(0.101)	No causality(ITR<≠>FDI)
Niger	10.156(0.207)	30.937(0.023)[b]	Unidirectional (FDI=>ITR)
Nigeria	24.094(0.041)[b]	21.146(0.054)[c]	Bidirectional (ITR<=>FDI)
Rwanda	11.739(0.164)	9.426(0.231)	No causality(ITR<≠>FDI)
Sao Tome and Principe	19.313(0.065)[c]	0.365(0.994)	Unidirectional (ITR=>FDI)
Senegal	3.874(0.601)	40.152(0.012)[b]	Unidirectional (FDI=>ITR)
Seychelles	2.131(0.816)	25.742(0.035)[b]	Unidirectional (FDI=>ITR)
Sierra Leone	3.176(0.682)	0.389(0.993)	No causality(ITR<≠>FDI)

South Africa	40.184(0.012)b	3.136(0.687)	Unidirectional (ITR⇒FDI)
Sudan	18.065(0.075)c	6.497(0.375)	Unidirectional (ITR⇒FDI)
Swaziland	2.073(0.824)	8.508(0.267)	No causality(ITR⇏FDI)
Tanzania	2.904(0.716)	3.013(0.703)	No causality(ITR⇏FDI)
Togo	44.671(0.010)b	44.534(0.010)b	Bidirectional (ITR⇔FDI)
Tunisia	9.063(0.244)	8.807(0.255)	No causality(ITR⇏FDI)
Uganda	21.180(0.054)c	5.534(0.444)	Unidirectional (ITR⇒FDI)
Zambia	2.265(0.799)	14.421(0.115)	No causality(ITR⇏FDI)
Zimbabwe	3.486(0.645)	6.003(0.409)	No causality(ITR⇏FDI)

Notes:

i. ITR⇏FDI indicates ITR does not cause FDI; FDI⇏ITR indicates FDI does not cause ITR.

ii. [a], [b] and [c] rejection of null hypothesis (H0) at 1%, 5% and 10% significance level, respectively.

iii. p-values associated with the Wald statistic are placed in round brackets.

iv. p-values are calculated with 100 bootstrap replications.

TABLE 3: PANEL AND COUNTRY-SPECIFIC CAUSALITY TEST RESULTS (CONTINUED)

		BIC	
	H0: ITR⇏FDI	**H0: FDI⇏ITR**	**Causality direction**
	1.608(0.520)	**3.529(0.010)[b]**	**Unidirectional (FDI⇒ITR)**
Algeria	0.394(0.538)	7.046(0.016)[b]	Unidirectional (FDI⇒ITR)
Angola	15.847(0.001)[a]	0.777(0.390)	Unidirectional (ITR⇒FDI)
Benin	0.002(0.967)	0.656(0.429)	No causality(ITR⇏FDI)
Botswana	2.980(0.101)	3.972(0.062)[c]	Unidirectional (FDI⇒ITR)
Burundi	6.646(0.019)[b]	0.222(0.643)	Unidirectional (ITR⇒FDI)
Cameroon	1.269(0.275)	2.617(0.123)	No causality(ITR⇏FDI)
Cape Verde	0.010(0.923)	2.883(0.107)	No causality(ITR⇏FDI)
Central African Republic	0.498(0.489)	0.010(0.920)	No causality(ITR⇏FDI)
Comoros	0.966(0.339)	4.813(0.042)[b]	Unidirectional (FDI⇒ITR)
Congo Republic	0.949(0.343)	5.821(0.023)[b]	Unidirectional (FDI⇒ITR)
Côte d'Ivoire	1..695(0.209)	1.668(0.213)	No causality(ITR⇏FDI)
Djibouti	4.837(0.041)[b]	1.757(0.202)	Unidirectional (ITR⇒FDI)
Egypt	1.103(0.308)	0.678(0.421)	No causality(ITR⇏FDI)
Ethiopia	4.162(0.056)[c]	1.995(0.175)	Unidirectional (ITR⇒FDI)
Gabon	0.899(0.356)	0.553(0.467)	No causality(ITR⇏FDI)
Gambia	0.001(0.978)	0.717(0.408)	No causality(ITR⇏FDI)
Ghana	0.002(0.968)	5.651(0.029)[b]	Unidirectional (FDI⇒ITR)
Guinea-Bissau	4.820(0.042)[b]	0.492(0.492)	Unidirectional (ITR⇒FDI)
Kenya	0.031(0.862)	4.566(0.047)[b]	Unidirectional (FDI⇒ITR)

Lesotho	0.058(0.813)	0.009(0.927)	No causality(ITR⇏FDI)
Madagascar	0.695(0.415)	0.420(0.525)	No causality(ITR⇏FDI)
Malawi	0.735(0.402)	0.033(0.858)	No causality(ITR⇏FDI)
Mali	0.122(0.732)	16.510(0.001)[a]	Unidirectional (FDI⇒ITR)
Mauritius	1.289(0.271)	7.971(0.011)[b]	Unidirectional (FDI⇒ITR)
Morocco	0.016(0.900)	7.223(0.015)[b]	Unidirectional (FDI⇒ITR)
Mozambique	0.017(0.898)	0.250(0.623)	No causality(ITR⇏FDI)
Namibia	0.690(0.417)	7.000(0.016)[b]	Unidirectional (FDI⇒ITR)
Niger	1.302(0.269)	3.762(0.068)[c]	Unidirectional (FDI⇒ITR)
Nigeria	0.575(0.458)	0.063(0.805)	No causality(ITR⇏FDI)
Rwanda	2.913(0.105)	30.694(0.000)[a]	Unidirectional (FDI⇒ITR)
Sao Tome and Principe	0.002(0.968)	0.046(0.832)	No causality(ITR⇏FDI)
Senegal	0.369(0.551)	3.582(0.075)[c]	Unidirectional (FDI⇒ITR)
Seychelles	2.348(0.143)	1.793(0.197)	No causality(ITR⇏FDI)
Sierra Leone	2.104(0.164)	0.126(0.727)	No causality(ITR⇏FDI)
South Africa	0.539(0.473)	4.871(0.041)b	Unidirectional (FDI⇒ITR)
Sudan	1.942(0.180)	1.430(0.247)	No causality(ITR⇏FDI)
Swaziland	4.289(0.053)c	0.021(0.886)	Unidirectional (ITR⇒FDI)
Tanzania	0.026(0.874)	7.072(0.016)b	Unidirectional (FDI⇒ITR)
Togo	0.064(0.802)	1.277(0.273)	No causality(ITR⇏FDI)
Tunisia	0.839(0.372)	4.696(0.044)b	Unidirectional (FDI⇒ITR)
Uganda	0.086(0.773)	0.980(0.335)	No causality(ITR⇏FDI)
Zambia	0.529(0.476)	4.747(0.043)b	Unidirectional (FDI⇒ITR)
Zimbabwe	0.482(0.497)	0.277(0.605)	No causality(ITR⇏FDI)

Notes:

i. ITR⇏FDI indicates ITR does not cause FDI; FDI⇏ITR indicates FDI does not cause ITR.

ii. [a], [b] and [c] rejection of null hypothesis (H0) at 1%, 5% and 10% significance level, respectively.

iii. p-values associated with the Wald statistic are placed in round brackets.

iv. p-values are calculated with 100 bootstrap replications.

4. Conclusion and policy implications

The aim of this study is to examine the nexus between international tourism and FDI in Africa for the period 1995-2016. To achieve this aim, it uses a panel of 43 countries and applies the Dumitrescu and Hurlin (2012) panel Granger non-causality testing approach which considers the heterogeneity of countries and does not assume cross-sectional independence. Using two lag order selection criteria to select the optimal lag length for the bivariate panel VAR model, the panel causality test results reveal that there is a homogenous unidirectional

causality from FDI to international tourism. Taking into consideration the country-heterogeneity (country-specific causality test results), this study finds that the absence of causality between international tourism and FDI is demonstrated in 8 countries only (Cape Verde, Central African Republic, Côte d'Ivoire, Lesotho, Madagascar, Malawi, Sierra Leone, and Zimbabwe), irrespective of the lag order selection criteria. This finding suggests that, for the most part, there is causality between international tourism and FDI in at least one direction.

The policy implications emanating from this study are documented as follows. First, in countries where there is evidence of unidirectional causality from international tourism to FDI, policies aimed at developing the tourism industry should be implemented in order to encourage the inflow of FDI. Second, in the case of countries with evidence of unidirectional causality from FDI to international tourism, the tourism industry in these countries can be developed by creating policies that would stimulate FDI inflows. Lastly, the evidence of bidirectional causality in precisely Nigeria and Togo indicates that international tourism and FDI complement each other, suggesting that policies aimed at developing the tourism industry and attracting FDI should be simultaneously implemented in both countries. For future research direction, it would be worthwhile to explore the stability of the international tourism-FDI nexus in African countries. In other words, future studies can examine whether the causality direction between international tourism and FDI vary over time.

Biographical Notes

Olufemi Adewale Aluko holds a Master of Science degree in Finance from University of Ilorin, Kwara State, Nigeria. His research interests include but not limited to development finance, international finance and financial economics. His research has been published in peer-reviewed journals such as *African Development Review, Journal of International Trade and Economic Development*, *Economic Notes* and *Economic Change and Restructuring* among others.

References

Acquah, A. M., & Ibrahim, M. (2019). Foreign direct investment, economic growth and financial sector development in Africa. *Journal of Sustainable Finance & Investment*. https://doi.org/10.1080/20430795.2019.1683504.

Adeola, O., Boso, N., & Evans, O. (2018). Drivers of international tourism demand in Africa. *Business Economics*, 53(1), 25-36.

Adeola, O., & Evans, O. (2019). Digital tourism: mobile phones, internet and tourism in Africa. *Tourism Recreation Research*, 44(2), 190-202.

Anyanwu, J. C. (2012). Why does foreign direct investment go where it goes? New evidence from African countries. *Annals of Economics & Finance*, 13(2), 425-462.

Arain, H., Han, L., Sharif, A., & Meo, M. S. (2019). Investigating the effect of inbound tourism on FDI: The importance of quantile estimations. *Tourism Economics*. https://doi.org/10.1177/1354816619859695.

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies*, 47(1), 239-253.

Craigwell, R., & Moore, W. (2008). Foreign direct investment and tourism in SIDS: Evidence from panel causality tests. *Tourism Analysis*, 13(4), 427-432.

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450-1460.

Endo, K. (2006). Foreign direct investment in tourism—flows and volumes. Tourism Management, 27(4), 600-614.

Fayissa, B., Nsiah, C., & Tadasse, B. (2008). Impact of tourism on economic growth and development in Africa. *Tourism Economics*, 14(4), 807-818.

Fereidouni, H. G., & Al-mulali, U. (2014). The interaction between tourism and FDI in real estate in OECD countries. *Current Issues in Tourism*, 17(2), 105-113.

Holzner, M. (2011). Tourism and economic development: The beach disease? *Tourism Management*, 32(4), 922-933.

Hurlin, C., & Venet, B. (2001). Granger causality tests in panel data models with fixed coefficients. Cahier de Recherche EURISCO, September, Université Paris IX Dauphine.

Ibrahim, M., Adam, I. O., & Sare, Y. A. (2019). Networking for foreign direct investment in Africa: How important are ICT environment and financial sector development? *Journal of Economic Integration*, 34(2), 346-369.

Kim, H. J., Chen, M. H., & Jang, S. (2006). Tourism expansion and economic development: The case of Taiwan. *Tourism Management*, 27(5), 925-933.

Lee, J. W., & Brahmasrene, T. (2013). Investigating the influence of tourism on economic growth and carbon emissions: Evidence from panel analysis of the European Union. *Tourism Management*, 38, 69-76.

Li, X., Huang, S. S., & Song, C. (2017). China's outward foreign direct investment in tourism. *Tourism Management*, 59, 1-6.

Norris, P. (2000). Global governance and cosmopolitan citizens. In Nye, J. S., & Donahue, J. D. (Eds). *Governance in a globalizing world* (pp. 86-108). Washington DC: Brookings Institution Press.

OECD (2008). OECD benchmark definition of foreign direct investment (Fourth Edition). Paris: Organisation for Economic Co-operation and Development.

Opoku, E. E. O., Ibrahim, M., & Sare, Y. A. (2019). Foreign direct investment, sectoral effects and economic growth in Africa. *International Economic Journal*. https://doi.org/10.1080/10168737.2019.1613440.

Perić, J., & Radić, M. N. (2016). FDI-led tourism growth hypothesis: empirical evidence from Croatian tourism. *European Journal of Tourism, Hospitality and Recreation*, 7(3), 168-175.

Pesaran, M. H. (2004). General diagnostic tests for cross section dependence. IZA Discussion Paper No. 1240, The Institute for the Study of Labor, Bonn.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.

Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*, 68(1), 79-113.

Pesaran, M. H., Ullah, A., & Yamagata, T. (2008). A bias-adjusted LM test of error cross-section independence. *The Econometrics Journal*, 11(1), 105-127.

Sanford, D. M., & Dong, H. (2000). Investment in familiar territory: Tourism and new foreign direct investment. Tourism Economics, 6(3), 205-219.

Selvanathan, S., Selvanathan, E. A., & Viswanathan, B. (2012). Causality between foreign direct investment and tourism: Empirical evidence from India. *Tourism Analysis*, 17(1), 91-98.

Tang, S., Selvanathan, E. A., & Selvanathan, S. (2007). The relationship between foreign direct investment and tourism: Empirical evidence from China. *Tourism Economics*, 13(1), 25-39.

Tomohara, A. (2016). Japan's tourism-led foreign direct investment inflows: An empirical study. *Economic Modelling*, 52, 435-441.

Tugcu, C. T. (2014). Tourism and economic growth nexus revisited: A panel causality analysis for the case of the Mediterranean Region. *Tourism Management*, 42, 207-212.

UNCTAD (2007). FDI in tourism: The development dimension. Geneva: United Nations Conference on Trade and Development.

Viljoen, A., Saayman, A., & Saayman, M. (2019). Determinants influencing inbound arrivals to Africa. *Tourism Economics*, 25(6), 856-883.