TOURISM AND TRADE NEXUS IN SELECTED DEVELOPING COUNTRIES

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ABSTRACT

This study examines the long-run and short-run relationships between tourism and trade in a large sample of developing countries over the period 1995 to 2014. The study uses dynamic panel cointegration techniques that are robust to omitted variable bias, slope heterogeneity, and cross-sectional dependence. We draw three main conclusions for developing countries: (1) tourism and trade are cointegrated, and the results are robust to controlling for cross-sectional dependence; (2) tourism and trade are positively related both in the short run and the long run, suggesting that they might be complements; and (3) the causal relationship is bidirectional, with the implication that international trade might be both the cause and the consequence of tourism. **JEL Classification:** C33, F40, Z32

INTRODUCTION

Globalization and trade liberalization across countries has spurred both international trade and international travel. To contextualize the current magnitude of the international tourism industry, the joint report of the International Trade Centre and the World Tourism Organization (Henceforth ITC-WTO, 2015) ranks tourism as fourth in the category of worldwide exports, contributing about 10% of the world's production and creating one in eleven jobs globally. The ITC-WTO (2015) also reports that, as of 2013, 30% of international trade in services, or about US$ 1.5 trillion in export earnings, were attributed to international tourism. Therefore, there has been a growing interest in analyzing the interlinkages between international trade, as measured by trade openness measures, and international travel.

Understanding the nature of the relationship is important for making policy decisions. For example, several empirical studies document positive effects of trade openness on economic growth (see, e.g., Lopez (2005) and Harrison (1996) for a literature survey), while others show a positive effect of tourism on economic growth (see, e.g., Fayissa et al. (2008)) in developing countries. If the results show a positive relationship between international travel and international trade, the implication is that these two variables might be complements. Thus, policies intended to spur trade might indirectly affect international travel. Furthermore, finding a negative relationship between international trade and international travel might signify a trade-off between the two variables. Therefore, policies intended to spur trade might have an opposite effect on the interlinkages between international trade and international travel in developing countries. Although this paper is closely related to studies such as Kulendran and Wilson (2001) and Santana-Gallego et al. (2011), our study differs from its predecessors in two ways. First, this study focuses on a large sample of developing countries, which the literature has not yet explored. According to the ITC-WTO (2015) report, nearly 45% of all international tourism is to developing countries and emerging economies, and this number is expected to increase to 57% by 2030. Therefore, providing evidence of how international tourism and trade affect one another is important for policy formulation in developing countries.

Second, this study employs econometric methods that are robust to endogeneity and omitted variable bias. More specifically, unlike Kulendran and Wilson (2001), who used time-series data, we employ a panel data technique that combines the time-series variation and the cross-sectional variation. According to Levin et al. (2003), the addition of cross-sectional variation to time-series variation improves estimation efficiency.

Additionally, this study uses dynamic heterogeneous panel cointegration techniques that are not only immune to endogeneity issues and omitted variable bias, but that also consider cross-sectional dependence. This contrasts with Santana-Gallego et al. (2011), who explore the relationships from OECD countries' perspective and do not fully consider the possibility of cross-sectional dependence in the form of common shocks that could be affecting all countries.

Using a large sample of 103 developing countries, we find a positive relationship between international travel, as measured by tourism arrivals, and international trade, as measured by exports in goods and services, imports in goods and services, and trade, as measured by the sum of import and exports in goods and services. Our results are robust to different estimation techniques. Upon testing for a causal relationship, we find evidence that the causality between trade and tourism is bidirectional. These results suggest that tourism and openness to trade may be complements. Therefore, policies intended to stimulate international trade also encourage international travel.

The rest of this paper is organized as follows: Section 2 includes a brief literature review. Section 3 describes the empirical strategy and the data. Section 4 reports and discusses the results, and Section 5 concludes.

A BRIEF LITERATURE REVIEW

Theoretically, several phenomena explain the relationship between international trade and international travel, and the causality of the relation can run in either or both directions. Intuitively, in a country's balance of payments, expenditures associated with international arrivals are exports in receiving countries and imports in the sending country. Therefore, international trade and tourism should be interlinked; however, the nature and direction of the relationship cannot be determined unambiguously.

Indeed, Kulendran and Wilson (2001)—among the earliest to empirically examine the long-run relationship from the macroeconomic perspective—propose three hypotheses that can explain the nature of the relationship: "the Marco Polo hypothesis," "the interest and awareness hypothesis," and "the opportunity hypothesis." The authors define the Marco Polo hypothesis as the possibility that tourism can lead to international trade as more people travel for business, which can stimulate both export sales and import sales. This can be observed when tourism leads to job creation in a receiving country. Specifically, UNWTO (2015) reports that one out of eleven jobs are directly linked to tourism. Therefore, an increase in tourism can lead to more international trade through production stimulation.

On the other hand, more trade might lead to increased international travel. Kulendran and Wilson (2001) call this "the interest and awareness hypothesis." This can be observed clearly when people travel abroad for leisure because they are attracted to the amenities at their destinations, and this may stimulate export sales. This hypothesis has been addressed extensively, especially in studies that estimate the tourism demand equation and include variables related to international trade as explanatory variables. See, for example, the literature following Eilat and Einav (2004), Naude and Saayman (2005), and Santana-Gallego et al. (2009), all of whom find evidence that international trade openness is an important determinant of tourism demand.

Finally, trade and tourism can be interlinked, according to Kulendran and Wilson's (2001) "opportunity hypothesis," which postulates that international holiday travel might just stimulate international trade. Thus, the literature clearly shows that the relationship between trade and international tourism is complex and that causality might run in both directions. To detangle the causality, several empirical studies use time-series data, such as Kulendran and Wilson (2001), who use data from Australia; Khan et al. (2005), who use data from Singapore; and Keum (2011), who uses data from Korea. These studies find strong evidence of a long-run relationship between tourism and trade. However, these country-specific studies are special cases from developed countries, and their results might not necessarily apply to developing countries.

Other studies use either panel data techniques or cross-sectional data and attempt to decipher the relationship by including trade measures in a tourism demand equation. For example, Santana-Gallego et al. (2011), using data from OECD countries and panel data techniques, find evidence supporting the "opportunity hypothesis." Our paper differs from its predecessors by providing evidence from developing countries, and we focus on panel data techniques that are robust to endogeneity issues and cross-sectional dependence

METHODOLOGY

Empirical specification

Based the proposed hypothesis by Kulendran and Wilson (2001), the causality between trade and tourism can be understood in both directions. However, similar to Santana-Gallego et al. (2011), we initially assume that trade openness causes international travel. Therefore, the long-run relationship between the variables can be expressed as:

$$Ln(Tourism)_{it} = z_{it}^{'}\beta_{0i} + \beta_1 Ln(Openness)_{it} + e_{it}, \qquad (1)$$

where $Ln(Tourism)_{it}$ is a measure of international tourism arrivals in country i in year t; z_{it} is a vector of deterministic terms, such as country-specific fixed effects and time-specific time trends. $Ln(Openness)_{it}$, is a measure of international trade (trade, imports or exports), and e_{it} is the error term which is assumed to be white noise. If the variables are integrated of the same order or share a common stochastic trend, Equation (1) can be interpreted as a long-run relationship. And, hence, β_1 represents the long-run effect of international trade on international travel.

Panel unit root test

The first step in the empirical investigation involves pre-testing the variables to determine the order of integration. For most macroeconomic data, it is reasonable to assume that the time series are non-stationary unit root processes. To this end, we verify the non-stationarity of the variables by using the Im, Peseran, and Shin (2001) test (IPS), which controls for cross-sectional heterogeneity in the estimated coefficients. The ADF regression for the IPS can be expressed as follows:

$$\Delta x_{it} = z_{it}^{'}\gamma + \alpha_i \Delta x_{it-1} + \sum_{i=1}^{p_i} \emptyset_{ij}\, \Delta x_{it-j} + \upsilon_{it}, \qquad (2)$$

where x_{it} is each variable of interest; z_{it} is a vector of deterministic terms, such as individual time trends and fixed effects; and j is the number of lags and each country is allowed to have different optimal lag length. The null hypothesis for the IPS test is the unit root for all i (e.g., $H_0 : \alpha_i=0$), and the alternative is the presence of stationarity in at least one of the panels (e.g., $H_1 : \alpha_i<0, \forall$ i= 1, 2, . . ., N; $\alpha_i=0$, i=N_1+1 , N_2+2,...,N). The IPS test statistics combines individual unit root tests to obtain a panel-specific result.

$$\Gamma_i = \frac{\sqrt{N}[\bar{t}_{NT} - \mu]}{\sqrt{v}}, \qquad (3)$$

One drawback of the IPS test is that it does not control for cross-sectional dependence in the error term. Maddala and Wu (1999) and Choi (2001) propose other methods that control for cross-sectional heterogeneity: the Fisher-ADF and the Fisher-*PP* tests. These tests are non-parametric tests for panel unit root, and the tests are based on combining individual p-values from the individual unit root tests. The results from these tests, although not reported in this paper, are similar to those of IPS and provides similar conclusions. The main drawback of these tests is that they still do not control for cross-sectional dependence in the error term. Therefore, we also check for the stationarity of the series using the cross-sectionally-augmented IPS (CIPS), which is based on the cross-sectional augmented ADF (CADF) regression. The CADF regression can be expressed as:

$$\Delta x_{it} = z_{it}^{'}\gamma + \alpha_i x_{it-1} + \sum_{j=1}^{p_i} \emptyset_{ij}\, \Delta x_{it-j} + \eta_i \bar{x}_{it-1} + \sum_{j=0}^{p_i} \varphi_{ij}\, \Delta \bar{x}_{it-j} + \xi_{it}, \qquad (4)$$

Where X_{it} is the country mean of time series of interest. The cross-sectionally augmented IPS is the average of the individual country CADF statistics and the corresponding critical values are given by Pesaran (2007).

Panel cointegration test

After establishing that the series are integrated in the same order, the next step is to test for the presence of the long-run equilibrium relationship. The literature suggests several methods; however, we employ a two-step residual-based cointegration test procedure suggested by Pedroni (1999, 2004). The first step involves estimating the long-run relationship regression separately for each country. This can be expressed as:

$$Ln(Tourism)_{it} = \alpha_i + \delta_i t + \beta_i Ln(Openness)_{it} + \epsilon_{it}. \quad (5)$$

The second step involves testing the stationarity of the residuals from Equation (5). The null hypothesis is that there is no integration, and Pedroni (1999, 2004) proposes seven test statistics. The first four tests statistics are within-dimension statistics that are based on pooling the autoregressive coefficients across countries during the unit root test, restricting the autoregressive parameters to be homogeneous across countries. The remaining three test statistics are between-dimension statistics based on individually estimating the autoregressive coefficients for each country and, thus, allowing for cross-country heterogeneity. One notable drawback of the Padroni procedure is that it does not control for potential cross-sectional dependence in the error term, which can represent common global shocks. Holly et al. (2001) propose yet another two-step cointegrated procedure in the presence of possible cross-country dependence—the Common Correlated Effects (CCE) estimator, based on Pesaran (2006). The first step involves estimating a cross-sectionally augmented cointegration regression for each country i. The CCE regression can be written as:

$$Ln(Tourism)_{it} = \alpha_i + \delta_i t + \beta_i Ln(Openness)_{it} + b_{1i}\, \overline{Ln(Tourism)}_t + b_{2i}\, \overline{Ln(Openness)}_t + e_{it}, \quad (6)$$

where, $\overline{\text{Ln(Tourism)}}_t$ and averaged $\overline{\text{Ln(Openness)}}_t$ are the cross-country averages of tourism and trade openness measures, respectively, and they serve as the unobserved factors. The second step involves computing CIPS statistics for the residuals from the individual long-run relationship, such as $\varpi = a_i + Ln(Tourism)_{it} - \left[\hat{\delta}_i t + \hat{\beta}_i Ln(Openness)_{it}\right]$.

The long-run relationship

The next step in the estimation of the long-run effect of international trade on international travel involves estimating the cointegration vector. This study uses the between-group mean panel dynamic OLS (DOLS) estimator proposed by Pedroni (2001). This method has several advantages over the within-group approaches. First, unlike the within-group approach, the panel DOLS procedure allows the cointegration vectors to vary across countries (Pedroni, 2001). This is important because it allows us to estimate the effect of openness on tourism by country. Another advantage is that, for the between-group estimators, the point estimates can be interpreted as the mean value of the co-integration vectors (Pedroni, 2001). The DOLS model for equation (1) can be expressed as:

$$Ln(Tourism)_{it} = \alpha_i + \delta_i t + \beta_i Ln(Openness)_{it} + \sum_{j=-q}^{q} \emptyset_{ij}\ \Delta Ln(Openness)_{it-j} + \epsilon_{it}, \quad (7)$$

where $\emptyset_{ij}$ is a vector of coefficients of leads and lag differences. The advantage of using the DOLS procedure is that the estimated coefficients have been shown to be unbiased, even in the presence of endogenous regressors. The panel DOLS ($\hat{\beta}^*_{PDOLS}$) estimates are obtained using the following formula:

$$\hat{\beta}^*_{PDOLS} = \left[\frac{1}{N}\sum_{i=1}^{N}\left(\sum_{t=1}^{T} Z_{it}\, Z_{it}^{'}\right)^{-1}\left(\sum_{t=1}^{T} Z_{i,t}\ \mathrm{Ln}(\widetilde{Tourism})_{it}\right)\right]_1, \quad (8)$$

Where

$$Ln(\widetilde{Toursim})_{i,t} = Ln(Tourism)_{i.t} - \overline{Ln(Tourism)_i}$$

and

$$K_{it} = \left[Ln(Openness)_{it} - \overline{Ln(Openness)_i}\,, \Delta Ln(Openness)_{it-s}, \ldots, \Delta Ln(Openness)_{it+s}\right]$$

is a *2(s+1)* vector of regressors. A bar over a variable denotes a mean, and the subscript 1 outside the brackets indicates that the first elements of the vector are used to obtain the pooled slope coefficient. Notice that the expression following the summation is over 1, this is similar to the typical DOLS estimator, and the between estimator can be calculated as the average of the individual country level DOLS estimators.

Short-run and long-run causality

Though the DOLS does not require that regressors are exogenous, and the cointegration implies long-run Granger causality in at least one direction, as we saw in the introduction, the causality might run in either direction. In addition to deciphering the presence of the long-run relationship between international trade and international travel, this paper also attempts to detect the direction of the long-run causality. Thus, to test the direction of the long-run causality and the short-run dynamics between the variables, residuals from the individual DOLS of the long-run relationship, are used as an error-correcting term in a simple panel vector error correcting model (VECM) in the form:

$$\begin{bmatrix}\Delta Ln(Tourism)_{it}\\ \Delta Ln(Openness)_{it}\end{bmatrix} = \begin{bmatrix}c_{1i}\\ c_{2i}\end{bmatrix} + \sum_{j=1}^{k}\Gamma_j\begin{bmatrix}\Delta Ln(Openness)_{it-j}\\ \Delta Ln(Tourism)_{it-j}\end{bmatrix} + \begin{bmatrix}\alpha_1\\ \alpha_2\end{bmatrix} Ec_{it-1} + \begin{bmatrix}\varepsilon_{1i}\\ \varepsilon_{2i}\end{bmatrix}. \quad (9)$$

To this end, c_1 is are fixed effects; Ec_{it-1} is the error-correction term that captures the error in or the deviation from the equilibrium; therefore, α_1 and α_2 are the adjustment coefficients that capture the extent to which *Ln(Tourism)* and *Ln(Openness)* respond from the long-run or equilibrium relationship, respectively. Hill and Milne (1994) demonstrate that a significant error-correcting term suggests long-run Granger causality, and thus, long-run endogeneity and a non-significant adjustment coefficient imply long-run Granger non-causality from the independent variable to the dependent variable.

DATA

All data are from the World Bank Development Indicators database (available online at: http://data.worldbank.org/data-catalog/world-development-indicators). We restrict the sample to all developing countries with data available for all variables of interest. The sample consists of 103 countries spanning the 20-year period from 1995 through 2014. In general, identification and estimation of the long-run relationship require very long time series. However, for the panel cointegration, the combination of the cross-sectional variation and the time-series variation enables us to relax the requirement of very long time-series data. Therefore, we have 2060 observations in total. The Appendix includes the list of countries included in our study, and Table 2A includes the descriptive statistics of the data use.

Following the literature and Santana-Gallego et al. (2011), international tourism is approximated by the number of international arrivals (denoted as *Tourism*), and international trade (denoted as *Openness*) are the typical three trade measures: imports in goods and services as a percentage of GDP (*Imports*); exports of goods and services as a percentage of GDP (*Exports*); and trade (*Imports* plus *Exports*) as a percentage of GDP (*Trade*). We focus on international arrivals as a measure of tourism because of data availability. There is less data on international departures in most countries, especially developing countries. The data is transformed into natural logarithmic form so that the estimated coefficients (β_i) from Equation (1) represent the long-run elasticity of tourism with respect to trade.

ESTIMATION RESULTS

The panel unit root test results are reported in Table 1. For the IPS test, the AIC was used to select the optimal lag length, and the null hypothesis of the unit root in levels is rejected. After considering the cross-sectional dependence (whose results are reported in Table A2 in the appendix and shows that the series are cross-sectionally dependent) and employing the CIPS method proposed by Pesaran (2007), the null hypothesis of the unit root for the data in levels is not rejected. However, the CIPS shows that the null hypothesis of the unit root for the series in first differences is rejected. Since the pre-test of cross-sectional dependence based on Pesaran (2004) reveals that the data are cross-sectionally dependent, the CIPS test statistics results are used to conclude that the series of tourism and trade are integrated in the same order one, I(1). These results are consistent, regardless of the measure of international trade used. Therefore, we proceed with the cointegration tests.

The panel cointegration tests based on Pedroni (1999) and Holly *et al.* (2010) are reported in Table 2. For both tests, the null hypothesis is that the variables are not cointegrated. Using both tests, null hypothesis is rejected at a 5% significance level and thus the variables are cointegrated. An implication is that trade and tourism have a long-run relationship, and the next step involves estimating the cointegration vector. Table 3 reports the DOLS results, which show that, on average, there is a positive relationship between international travel and international travel. More specifically, the results show that a ten-percentage-point increase in international trade, as measured by trade, leads to a 1.72-percentage-point increase in international travel. Furthermore, a ten-percentage-point increase in imports leads to a 3.79-percent increase in international travel. And

To control for cross-sectional dependence in the long-run relationship, the Common Correlated Effects (CCE) estimator was used. Although the magnitude of the effects changes, the positive association is still evident. Overall, these results are consistent with Santana-Gallego et al. (2011), who find a positive relationship between tourism and trade for a sample of OECD countries. Therefore, this study shows that tourism and trade are positively related.

As discussed in the methodology section, one shortcoming of the DOLS estimate is that it does not provide full information about causality, although the estimated elasticities are consistent and unbiased. The DOLS results simply imply that there exists a long-run relationship between the variables and that the causality might run in either direction. On the one hand, it might be the case that, as more people travel to a country, they are there to explore business opportunities involving products that might be sold abroad as exports. This implies that international travel leads to more exports being sold. On the other hand, more people might be visiting a country because of its services and resources, and this might also result in more exports being sold. However, in the latter case, the causality is from international trade to international travel.

Due to this ambiguity, this study also investigates the direction of the causality using a VECM. The results are reported in Table 4. Because the error correction term is statistically significant in all equations. Hence, based on Hall and Milne's (1994) causality test, this exemplifies that both tourism and trade are endogenous and thus the long-run causality is bidirectional.

Table 4 also illustrates that there is a positive short-run relationship between international trade and international travel. Since we found that, on average, the long-run relationship is positive, these results suggest that the short-run positive effects persist in the long run.

CONCLUSION

Using data from 1994-2014, this study examines the short-run and long-run relationships between international travel and international trade in developing countries. Numerous studies document positive effects of both international trade and international travel on economic growth. However, only a few studies analyze their causal interlinkages in both the short run and the long run. Understanding the nature of the relationship is important for policy because it enlightens us as to whether these two variables are complements or substitutes in affecting growth. Therefore, finding a negative relationship implies a possible trade-off between the two, and, thus, one implication is that policies intended to increase international trade might deter international tourism. However, finding that the two variables are complements implies that policies intended to encourage international trade indirectly increase international travel.

This study contributes to the literature in several ways. First, to our knowledge, this is the first study to focus on the relationship between tourism and trade in a large sample of developing countries. This provides an interesting case because 45% of the world's international arrivals are to developing countries. Second, this paper employs panel cointegration techniques that are robust to omitted variable bias, slope heterogeneity and endogenous variables. The main advantage of using panel data analysis is the widely cited efficiency gains from the time variation and the cross-sectional variation (Levine *et. al.*, 2003).

Overall, this study documents evidence of a positive relationship between trade and tourism in developing countries in both the short run and the long run on average. These results are similar to the documented empirical evidence from case studies of developed countries. The main implication is that trade and tourism might be complements, and, if so, policy in developing countries should promote both simultaneously to achieve greater prosperity and economic well-being.

One of the limitations of the paper is the application of heterogeneous panel data that might not give a clear picture of trade and tourism nexus for individual countries. Therefore, availability of long time series data for each country is likely to provide a better picture and that could be a possible future extension of this paper.

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APPENDIX

List of countries and territories included in the study

Algeria(DZA), Angola(AGO), Antigua and Barbuda(ATG), Argentina(ARG), Armenia(ARM), Bahrain (BHR), Bangladesh(BGD), Barbados (BRB), Belarus (BLR), Belize (BLZ), Benin(BEN), Bhutan(BTN), Bolivia(BOL), Brazil(BRA), Bulgaria(BGR), Burkina Faso(BFA), Cambodia(KHM), Chile(CHL), China (CHN), Colombia(COL), Congo, Dem. Rep.(ZAR),Congo, Rep. (COG), Costa Rica(CRI), Croatia(HRV), Cuba(CUB), Dominica(DMA), Dominican Republic(DOM), Ecuador (ECU), Egypt, Arab Rep.(EGY), El Salvador(SLV), Estonia(EST), Fiji(FJI), Gambia(GMB), Georgia(GEO), Ghana(GHA), Grenada(GRD), Guyana(GUY), Haiti(HTI), Honduras(HND), India(IND), Indonesia(IDN), Iran, Islamic Rep.(IRN), Jordan(JOR), Kenya(KEN), Kiribati(KIR), Korea, Rep. (KOR), Kyrgyz Republic(KGZ), Lao PDR(LAO), Latvia(LVA), Lebanon(LBN), Lesotho(LSO), Lithuania(LTU),Macedonia, FYR MKD), Madagascar(MDG), Malawi(MWI), Malaysia(MYS), Maldives(MDV), Mali(MLI), Mauritius(MUS), Paraguay(PRY), Peru(PER), Philippines(PHL), Poland(POL), Puerto Rico(PRI), Romania(ROM), Russian Federation(RUS), Samoa(WSM), Seychelles(SYC), Sierra Leone(SLE), South Africa(ZAF), Sri Lanka(LKA), St. Kitts and Nevis(KNA), St. Lucia(LCA), St. Vincent and the Grenadines(VCT), Sudan(SDN), Suriname(SUR), Tanzania(TZA),Thailand(THA), Togo(TGO), Tonga(TON), Trinidad and Tobago(TTO), Tunisia(TUN), Turkey(TUR), Uganda UGA), Ukraine(UKR), Uruguay(URY), Vanuatu(VUT), Venezuela, RB(VEN), Vietnam(VNM) West Bank and Gaza(WBG), Zambia(ZMB), Zimbabwe(ZWE).

TABLE A1: DESCRIPTIVE STATISTICS OF THE DATA

Variable	Countries	Obs.	Mean	Std. Dev.	Min.	Max.
Tourism	103	2060	2971125	6413257	3400	5.77e+07
Trade	103	2060	84.41	37.89	14.77	225.03
Imports	103	2060	37.70	19.87	4.97	121.32
Exports	103	2060	46.72	21.56	8.91	150.47

Notes: All data are transformed into natural logs for our analysis

TABLE A2: PERASAN (2004) TESTS FOR CROSS-SECTIONAL DEPENDENCE

Variable	*CD*-test	ρ^*
$Ln(Tourism)_{it}$	202.03***	0.68
$Ln(Trade)_{it}$	39.71***	0.42
$Ln(Imports)_{it}$	39.99 ***	0.40
$Ln(Exports)_{it}$	26.83 ***	0.45

Notes: Under the null hypothesis of cross-section independence CD ~ N (0, 1)
ρ^* is the measure of absolute correlation.

TABLE 1. PANEL UNIT ROOT TEST

Variables	Deterministic terms	IPS statistics	CIPS statistics
Levels			
Ln(Tourism)$_{it}$	Constant and trend	-3.38**	-2.22
Ln(Trade)$_{it}$	Constant and trend	-7.84***	-240
Ln(Imports)$_{it}$	Constant and trend	-7.84***	-2.25
Ln(Exports)$_{it}$	Constant and trend	-5.73**	-2.67*
First differences			
ΔLn(Tourism)$_{it}$	Constant	-24.96***	-3.87***
Δ*Ln(Trade)*$_{it}$	Constant	-27.74***	-4.10***
Δ*Ln(Imports)*$_{it}$	Constant	-31.30***	-4.38***
Δ*Ln(Exports)*$_{it}$	Constant	-28.14***	-4.00***

Notes: Lags were selected automatically based on the Akaike Information Criterion (AIC) to adjust for autocorrelation for each model. And the largest lag length was 2. The null hypothesis for all the test is that all panels contain unit root process against the alternative that some panels are stationary. The IPS statistics have a standard normal distribution under the null hypothesis. For models with an intercept and linear trend, the relevant 1% (5%, 10%) critical values for the *CIPS* statistic is -2.63(-2.70, 2.85) and -2.88 (-2.72, -2.63).For models with intercept only the relevant 1% (5%, 10%) critical values for the *CIPS* statistic is -2.36 (-2.22, 2.11) with an intercept.
***, (**, *) Indicates significant levels at 1% (5%, 10%) level, respectively.

TABLE 2: PANEL COINTEGRATION TESTS

Independent variable is *Ln(Tourism)*$_{it}$			
Test statistic	**Dependent Variable**		
Pedroni (1999)	*Ln(Trade)*$_{it}$	*Ln(Import)*$_{it}$	*Ln(Export)*$_{it}$
Panel *v* statistic	2.48**	2.56***	2.12**
Panel PP *rho* statistic	-0.98	-1.08	-0.26
Panel PP *t* statistic	-5.63***	-5.71***	-4.82***
Panel ADF *t* statistic	9.95***	7.11***	10.96***
Group *rho* statistic	2.83**	2.69***	3.17***
Group PP *t* statistic	-3.94***	-4.07***	-3.26***
Group ADF *t* statistic	9.88***	7.01***	10.72***
Test for the residuals of the CCE long-run relationship			
CIPS Statistics	-2.27**	-2.19*	-2.23**

Notes: All test statistics are distributed N (0, 1), under a null of no cointegration. The relevant 5% (10%) critical values for the *CIPS* statistic is -2.2 (-2.11). ***, (**, *) indicates rejection of the null of no cointegration at the 1% (5%, 10%) level respectively.

TABLE 3: ESTIMATES OF THE LONG-RUN RELATIONSHIP

The dependent variable is *Ln(Tourism)*$_{it}$			
	Independent variables		
	Ln(Trade)$_{it}$	*Ln(Imports)*$_{it}$	*Ln(Exports)*$_{it}$
DOLS	0.17***	0.38***	0.29***
	(11.81)	(14.65)	(8.31)
CCE	0.22**	0.13*	0.15**
	(2.63)	(1.6)	(-2.04)

Notes: *t*-statistics are in parenthesis, ***, (**, *) indicates rejection of the null of a no cointegration 1% (5%, 10%) level respectively.

TABLE 4: VECTOR-ERROR-CORRECTION MODEL, LONG-RUN CAUSALITY AND SHORT RUN DYNAMIC

	The dependent variable at $_{it}$					
Independent variables	*ΔLn (Tourism)*	*ΔLn (Tourism)*	*ΔLn (Tourism)*	*ΔLn (Trade)*	*ΔLn (Imports)*	*ΔLn (Exports)*
ΔEc_{it-1}	-0.092***	-0.088***	-0.090***	0.021***	0.025***	0.022***
	(-11.82)	(-11.60)	(-11.62)	(4.48)	(4.98)	(3.80)
$\Delta Ln(Trade)_{it-1}$	0.26***					
	(7.45)					
$\Delta Ln(Imports)_{it-1}$		0.24***				
		(7.63)				
$\Delta Ln(Exports)_{it-1}$			0.17***			
			(6.00)			
$\Delta Ln(Tourism)_{it-1}$				0.089***	0.10***	0.090***
				(7.45)	(7.63)	(6.00)

Notes: *t*-statistics are in parenthesis, ***, (**, *) indicates rejection of the null of a no co-integration at the 1% (5%, 10%) level respectively. The maximum number of lag 1 was obtained by using a general to specific procedure. Thus, the insignificant short-run dynamics were dropped.