

CAUSALITY BETWEEN TOURISM EXPORTS AND TRADE OPENNESS: EMPIRICAL ANALYSIS FOR ROMANIAN TOURISM*

SR II Camelia Surugiu PhD
The National Institute for Research and Development
in Tourism, Bucharest, Romania
SR III Marius-Razvan Surugiu PhD
The Institute of National Economy
Romanian Academy, Bucharest, Romania

Abstract: This study investigates the causal relationships between tourism exports and trade openness, using the case of Romania. The study applies the unit root test, cointegration procedure and Granger causality test in vector error correction model (VECM), in the attempt to study the direction of the causalities. The results indicate one-way Granger causality, running from trade openness to tourism exports in the case of Romania.

JEL classification: L83, R15

Key words: tourism, cointegration, VECM, trade openness, exports

1. INTRODUCTION

Tourism is one of the most dynamic sectors of the world economy which helps various destinations in sustaining economic development and diversification of social communities. The academic literature mainly focused on the tourism demand modeling, in the attempt to forecast the tourist flows, including income, prices, exchange rates, population, distance as determinants of tourism. In the recent years, trade relationships are included, explaining the evolution of tourism demand, as it reduced the transaction costs between home and host country (Leitão, 2010). On the other hand, tourism activities may also support trade, generating various commercial opportunities. Consequently, the question raised relates to the causality relationships between tourism and trade, if international tourism sustains international trade or vice-versa international trade promotes international tourism.

The empirical investigations of the relationship tourism-trade indicated that international trade has a significant role in the evolution of foreign tourism demand. Keum (2010) defines tourism flows as a transnational movement of humans, while international trade represents the transnational flow of merchandise.

Shan and Wilson (2001) investigated the causal relationships between international tourism and international trade flows and the results indicated two-way Granger causality, implying that trade flows link tourism in the case of China. The findings of Aradhyula and Tronstad (2003) suggest that tourists visits have impact on trade if associated with various firms attributes such as ages, perceived need for

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geographic diversity, foreign language fluency, firm size. Muhammad and Andrews (2008) underlined that the exports of a country positively influence the foreign tourist arrivals, while Phakdisoth and Kim (2007) concluded that bilateral trade positively correlates with tourist arrivals.

Other authors investigated the relationship between trade openness, and the results showed that it has a positive impact on international tourist flows (Habibi et al, 2009; Surugiu et al, 2011). On the other hand, Eilat and Einav (2004) suggest that international tourism is driven by unique factors of production and should not be understood in a general equilibrium trade model.

The inverse relationship, running from tourism to trade was also investigated. Tourism promotes cross-border exports, stimulating entrepreneurial activities (Gil-Alana and Fischer, 2007). Sinclair and Tsegaye (1990) emphasized that tourism did not bring about a significant decrease in the instability of export earnings of most of the developing and industrialized countries.

The question raising is there is a causality relationship between international tourism and trade openness. Considering the previous empirical results, investigating the relationship between tourism and trade, the previous paper aims to test the export-led growth hypothesis (ELGH) addressed to Romania case study. The rest of the paper is organized as follows. The second section presents the analytical research methods in tourism sector. The third section presents the methodology and data used to investigate the relationship between tourism and trade openness. The forth section analyses the long-run relationship between tourism export and trade openness. The last section concludes the paper.

2. ANALYTICAL RESEARCH METHODS IN TOURISM SECTOR AND HYPOTHESES FORMULATION

Leonardo da Vinci once said that *experience does not err, only your judgments err by expecting from her what is not in her power*. Sometimes, it is difficult to interpret figures, especially the experience is missing and the researcher tends to judge a phenomenon without taking into consideration local specificity or he is not familiar with the field.

In the recent years, the instruments measuring tourism impact became more sophisticated, Hara (2008) arguing that in tourism analysis, the statistical or stochastic methodologies are predominant. Sinclair et al (2003) underline that more recent papers developed advanced econometric methods, and included the estimation of system of equations models. Hara (2008) classifies the analytical research methods for hospitality and tourism as follows:

- 1) Quantitative methods
 - (a) Stochastic methods:
 - (i) statistical methods group,
 - (ii) time-series (extrapolative),
 - (iii) regression (causal and others),
 - (iv) econometrics (causal)
 - (b) Nonstochastic (deterministic) methods:
 - (i) gravity models;
 - (ii) Input-Output Analysis (IOA): IO structure remains the core of other models such as SAM and CGE or even TSA framework;
 - (iii) Social Accounting Matrix (SAM);

(iv) Computable General Equilibrium (CGE);

(v) Tourism Satellite Account (TSA) - is not exactly the method rather an applied technique to capture tourism as an industry.

2) Qualitative methods (Delphi and others).

Econometric and statistical models caught a great deal of attention from the academia. Especially the econometric models became more used by the economists and consequently by tourism experts. Econometric is similar to regression and statistical models, but the difference come from the fact that econometricians tend to face more problems with violations of various assumptions used in the statistical environment (Hara, 2008).

In order to avoid the so-called ‘spurious regressions’, the researchers used the cointegration analysis which offer the advantage of using a large volume of information and offering results regarding the short-run and long-run causalities (Lee and Chang, 2008).

In the case of tourism, the expenditures of foreign tourists are significantly important in terms of revenues for both economic agents and government. Moreover, tourism has an indirect contribution generated by the commercial flows and it straightens the bilateral trade relationships between countries and diversification of exports. On the other hand, tourism expansion may be sustained by the previous commercial relationships between countries, the exports positively contributing to tourism growth through different means. International tourism is considered an uncommon type of export, because of the place of consumption, the consumer being the one who moves instead of the product (Cortes-Jimenez and Pulina, 2010).

International tourism is an invisible export, having a stabilizing effect on total exports of a country (Vanhove, 2005), and creating a flow of foreign currency (Archer et al., 2005). Ennew (2003) argues that tourism development reduces a country’s dependence on primary commodities (i.e. rubber, minerals), particularly exported abroad.

The present paper aims to test the export-led growth hypothesis (ELGH) addressed to Romania case study. In order to develop the specific empirical analysis, a set of hypotheses were formulated, as follows:

- Hypothesis 1: There is a long-run relationship between tourism exports and trade openness;
- Hypothesis 2: Tourism exports sustain trade openness;
- Hypothesis 3: Trade openness sustains tourism exports;
- Hypothesis 4: There is a bidirectional relationship between tourism exports and trade openness.

These hypotheses remain unverified for the case of Romanian tourism, the question of whether tourism exports increase sustains trade openness or vice versa, trade openness boost tourism exports.

3. METHODOLOGY AND DATA DESCRIPTION

In this paper the non-stationarity of the time series is tested, and the unit root tests are employed, respectively the Augmented Dickey-Fuller (ADF), Dickey-Fuller (DF) (1979, 1981) and Phillips and Perron (PP) (1988) tests, which can be performed on the levels and/or on the first differences of the used variables, in the analysis an autoregressive model being used. The null hypothesis for these tests is related to the existence of a unit root.

The possible existence of the cointegration must be also analyzed when testing hypotheses related to the relationship between variables, and this can be done by conducting the Johansen cointegration test (1988). Two or more non-stationary series may be stationary, and if such a stationary linear combination exists, the non-stationary time series are said to be cointegrated (Engle and Granger, 1987).

The analysis from this paper is based on Vector Error Correction Model (VECM), which can help to understand the nature of the non-stationarity among the different component series, this method adding to the multi-factor model features of error correction. The VECM characterize the short-run dynamics (Schubert et al, 2011), and shows how the variables come back to the equilibrium after a shock (Brida et al, 2008, 2010), and the VECM equation is written as follows:

$$\Delta y_{1,t} = \alpha_1(y_{2,t-1} - \beta y_{1,t-1}) + \varepsilon_{1,t} \quad (1)$$

A VECM approach is adopted in the investigation, the VECM being a restricted vector autoregressive (VAR) designed for the use with non-stationary series which are cointegrated. Finally, the impact of various shocks on endogenous variable through the orthogonalized and the accumulated impulse-response of the output to Cholesky one S.D. exogenous variable innovation were displayed.

The variables used in the econometric analysis were visitor exports and trade openness over the period 1990-2009, which are further described in Table 1.

Table 1. Description of the selected variables

Variables	Description of the variable	Period	Source
LEXP_2011US	Logarithm of Visitor Exports (US\$ bn),	1990-2009	World Travel & Tourism Council
I	Imports of goods and services, US constant prices	1990-2009	World Bank
E	Exports of goods and services, US constant prices	1990-2009	World Bank
LTO	Logarithm of Trade openness, where:	1990-2009	World Bank
	$TradeOpenness = \frac{I + E}{GDP}$		

Note:

*Calculated from nominal exchange rates and CPIs;

** Internal tourism consumption = Visitor exports + Domestic expenditure + Government individual spending (according to WTTC methodology); L –Natural logarithm

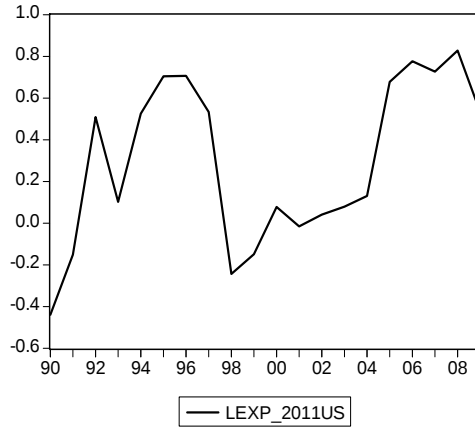
Source: authors' estimations

Visitor exports are a key component of the direct contribution of Travel and Tourism. Over the analyzed period, the visitor exports registered an oscillatory evolution, with growth and decrease rates, respectively during 1995-1998 period. Romania is expected to generate in 2009 USD 1.701 bn in visitor exports (foreign visitor spending, including spending on transportation), decreasing from USD 2.288 bn in 2008, by 25.6% (see Figure 1). The trade openness registered a positive evolution during the period 1990-2009, which is expected to positively influence the tourism sector (see Figure 2).

The model developed in this paper uses the hypotheses of previous researches (i.e. Shan and Wilson, 2001; Aradhyula and Tronstad, 2003; Leitão, 2010; Surugiu et al, 2011) further tested using cointegration techniques. As stated, the data and visitor exports, trade openness, over the period 1990-2009. Because of limited

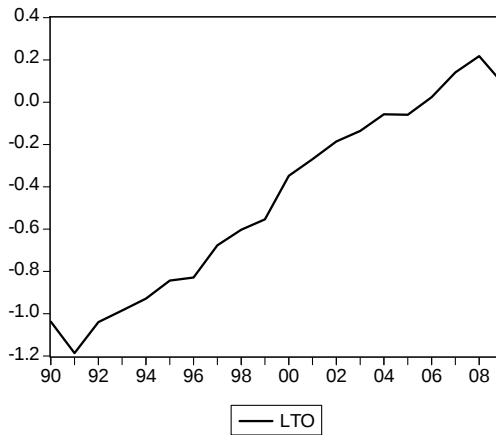
availability of the data on imports and exports, tourism openness was estimated starting with 1990. These variables used in the empirical analysis are expressed in natural logarithm for the interpretation of the coefficients as elasticity.

$$y_t = (LEXP_2011US_t, LTO_t) \quad (2)$$



Source: authors' representation using WTTC data

Figure 1. The evolution of the Visitor Exports, 1990-2009 period



Source: authors' representation using WB data

Figure 2. The evolution of the trade openness, 1990-2009 period

Consider a bivariate VECM among EXP_2011US and LTO, which in its most general form can be written as follows:

$$\begin{bmatrix} \Delta EXP_2011US \\ \Delta LTO \end{bmatrix} = \begin{bmatrix} \phi_{10,t} \\ \phi_{20,t} \end{bmatrix} + \begin{bmatrix} \gamma_{1,t} \\ \gamma_{2,t} \end{bmatrix} ECT_{t-1} + \sum_{j=1}^p \begin{bmatrix} \phi_{11,t}^{(j)} & \phi_{12,t}^{(j)} \\ \phi_{21,t}^{(j)} & \phi_{22,t}^{(j)} \end{bmatrix} \begin{bmatrix} \Delta EXP_2011US_{t-j} \\ \Delta LTO_{t-j} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (3)$$

where the error correction coefficients $\gamma_{1,t}$, $\gamma_{2,t}$ and $\gamma_{3,t}$ are also time varying, Δ is the first difference operator, ECT_{t-1} is the one period error correction term derived from the long-run cointegration equation, ε_{it} are the residual.

4. ANALYSES OF THE LONG – RUN RELATIONSHIP BETWEEN TOURISM EXPORT AND TRADE OPENNESS

This section aims to analyze the long-run relationship between tourism exports and trade openness applying unit roots tests and cointegration procedure. The second step is to apply VECM in the case of a cointegration vector between variables.

The null hypothesis of one unit root cannot be rejected in levels of variables LTO and LEXP_2011US, but is rejected in their first differences, both analyzed variables being integrated of order one, I(1). The results of the ADF, AD and PP tests are displayed in Table 2.

Table 2. Tests of hypotheses of nonstationarity of selected variables

Variables	Augmented Dickey–Fuller (ADF)	Dickey–Fuller GLS (AD)	Phillips-Perron (PP)
LTO	-0.476 (3)	-1.144 (3)	-0.428
LEXP_2011US	-2.515 (3)	-2.128 (3)	-2.535
First difference			
Δ LTO	-5.685 (3)***	-3.200 (3)***	-5.815***
Δ LEXP_2011US	-4.193 (3)***	-4.299 (3)***	-4.192 ***

Note:

Δ indicates the first differencing of the variable;

*** - the null hypothesis can be rejected at the 1% level; The ADF, AD and PP test equations include an intercept. The optimal lags selected for the ADF and AD tests based on the Schwarzs information criterion are in parentheses.

Source: authors' estimations

Given that integration of the two series is of the same order, we continued to test whether the two series are cointegrated over the sample period. The Johansen cointegration test indicated one cointegration equation between LTO and LEXP_2011US at 5% level, for both Trace statistic and Max-Eigen value statistic, respectively, confirming the hypothesis 5 of the study (see Table 3).

Table 3. Unrestricted Cointegration Rank Test

Trend assumption: Linear deterministic trend		
Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen value Statistic
Selected variables : LTO, LEXP_2011US		
Lags interval (in first differences): 1 to 3		
$r = 0$	16.946*	15.110*
$r \leq 1$	1.837	1.837

Note:

r is the number of cointegrating relations; the symbol * indicate that the null can be rejected at the 5% level.

Source: authors' estimations

The results in Table 4 of the Granger Causality testing for weak exogeneity of the variables indicate that the causality runs from trade openness to visitor exports, confirming the hypothesis 3 and rejecting the hypotheses 2 and 4. The test of weak exogeneity indicates that we can consider LTO as weakly exogenous variables at the 5% significance level. This feedback effect is not unexpected as the largest number of foreign tourists came from the trade-partner countries (i.e. Germany, Italy, France). This is in line with the previous findings of Turner and Witt (2001), Eilat and Einav (2004), Phakdisoth and Kim (2007), Habibi et al (2009), Leitão (2010).

The long-run estimated equation between LTO and LEXP_2011US is displayed below. The elasticity of visitor exports with respect to trade openness is 0.083. It means that increasing trade openness by 100% produces an increase of more than 8.3% of the Romanian visitor exports.

$$LEXP_2011US = 0.388 + 0.083 * LTO \quad (4)$$

Table 4. VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable	ΔLTO	$\Delta LEXP_2011US$	All
ΔLTO	-	0.122	0.122
$\Delta LEXP_2011US$	6.021**	-	6.021**

Note:

** indicate the significance of the relevant variable considering 5% probability value against the null hypothesis, where p-values correspond to the Chi-square distribution with 3 degree of freedom

Source: authors' estimations

VECM estimations are given by the equation below, where the coefficient for speed of adjustment of visitor exports is -0.504.

$$\begin{aligned} \Delta LEXP_2011US = & -0.504 * (LEXP_2011US_{t-1} - 0.083 * LTO_{t-1} - 0.388) + \\ & 0.261 * \Delta LEXP_2011US_{t-1} + 0.212 * \Delta LEXP_2011US_{t-2} \\ & - 2.655 * \Delta LTO_{t-1} + 0.864 * \Delta LTO_{t-2} + 0.131 \end{aligned} \quad (5)$$

$$R^2 = 0.486$$

In addition, we study the impulse response functions of visitor exports to a shock in trade openness. We examine the effects of LTO on LEXP_2011US using both the orthogonalised impulse-response functions and accumulated responses. Figure 3 show that the tourism exports respond negatively to a shock in trade openness, but after year five, the response became positive (see Figure 3).

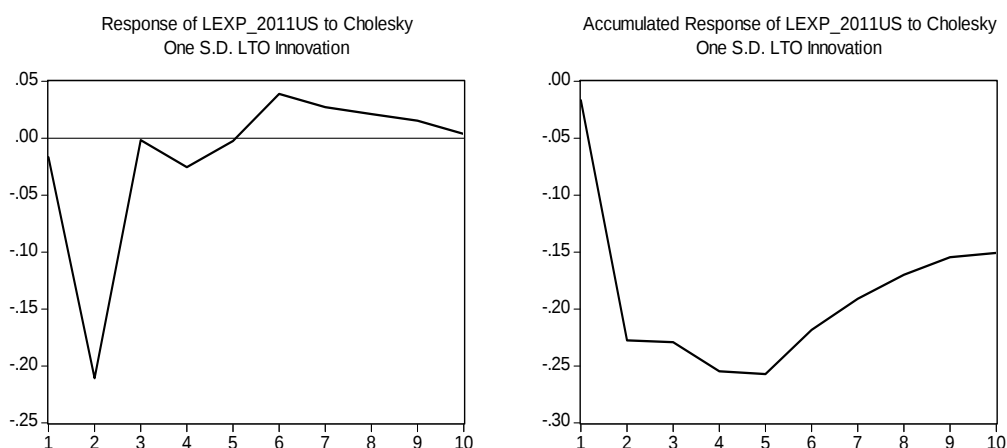


Figure 3. Impulse Response Functions of LEXP_2011US

Previous results are important for the decision-makers and policy-makers in tourism to consider developing new basin of tourism demand in those countries with which Romania has strong commercial relationships. In order to attract foreign tourists

and to become a competitive destination on the international tourism market, it is important to promote Romanian tourism offer on Germany, Italy, Hungary, United States of America etc. and to sustain Romanian tourism brand particularly on these markets.

5. CONCLUSIONS

This paper empirically investigated the long-run co-movements and the causal relationships between tourism exports and trade openness, measured as the ratio between import plus exports and gross domestic product. The results indicated that the selected series of data are non-stationary and Johansen cointegration test identified one cointegration equation at 5% level of significance. Consequently, we continued the investigation and the Granger Causality testing for weak exogeneity of the variables indicate that the causality runs from trade openness to visitor exports. The results of the paper confirm export-led growth hypothesis for the case of Romania.

We also study how tourism exports respond over time to shocks in trade openness. A positive shock to the trade openness, however, has a positive effect on tourism exports, after a 'stabilization period'.

In theory, trade openness can facilitate the use of cheaper and good quality local products (especially traditional agriculture products) instead the imported products with lower quality, thus supporting the local tourism sector from Romania, and thereby augmenting competitiveness. Nevertheless, trade openness can improve or harm tourism competitiveness, and that is why it is important to develop first an empirical analysis, before concluding on this issue. In our study the results of the investigation show first a negative influence on tourism sector, which is changing into a positive one after a certain period of time (in our case, five years). Thus, on long run, trade openness appears to be beneficial to tourism sector, improving the competitiveness and turning the tourism sector from Romania into a stronger one, capable to satisfy the increasing demands of tourists which are searching unique and nature-related experiences, and various eco-products and services.

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