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International trade and tourism for Mediterranean countries: A panel causality analysis

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Abstract. *This paper examines the causal relationship between international trade and tourism for 16 Mediterranean countries period from 1995 to 2013. We employ the recently introduced panel Granger causality approach that is flexible enough to take account of both cross-country correlation and heterogeneity across the countries. The empirical results indicate the causality from export to tourism in four out of sixteen Mediterranean Economies.*

Keywords: Mediterranean Countries, panel causality, International Trade, Tourism.

JEL Classification: F4, L83, C23, F13.

1. Introduction

In recent years, tourism forecasting using advanced econometric techniques has dominated the tourism literature (Witt and Witt 1995; Shan and Wilson 2001). Given the importance of tourism in both economic growth and sustainable development, special attention, on the one hand, is paid to the causal dynamics between trade and tourism. Empirical studies with the aim of uncovering the causation linkage between international trade and tourism yielded conflicting results. On the other hand, many scholars have paid keen interest in the causal linkage between tourism and a variety of variables, including international trade (inter alias, Kulendran and Wilson, 2000; Khan et al., 2005; Kadir and Jusoff, 2010), regional convergence (inter alias, Cortés-Jiménez, 2010; Soukiazis and Proenca, 2008), and political (in) stability (inter alias, Algieri, 2006 and Narayan et al., 2010). One of the prominent explanations behind the conflicting results on the causality between tourism and the variety of economic aggregates is the differences in institutional structure amongst countries. According to Landes (1998), cultural norms and institutions are often believed to explain why certain countries grow rich and others remain poor.

Theoretically, international travel may "induce" more trade opportunities, and further, business travel has been an important component of international travel since the 1980 s (World Tourism Organisation, 1997; Kulendran and Wilson, 1998). Therefore, does international travel promote international trade, or does trade promote travel? This "endogeneity" issue has fundamental implications for forecasting tourist demand/flows, because failure to consider this issue will result in inadequate appraisal of determinants of the tourist demand function. Second, some scholars point out that the econometric techniques used in previous studies are generally poor and hence are subject to some debate (Lim, 1997; Song et al., 1997; Witt and Witt, 1995; Shan and Wilson, 2001). Recently, an important number of studies have applied new developments in econometric theory, such as time series concepts of cointegration and Granger-causality testing procedures, to tourism studies. Third, tourism studies on Mediterranean countries are limited; noteworthy works are presented by section 2 literature review (see Table 1). The focus of these studies, however, is not on testing the panel causality relationship between international travel and international trade (Shan and Wilson, 2001, p. 279).

As matter of fact, in trade aimed travels to a country, a product is bought from the country visited (import) or is sold to that country (export). With this regard, a successful business travel to a country leads a trade stream between countries; as a result, in the scope of new trade/business negotiations or business travels between those countries, economic relations develop. This situation is an external effect of a successful commercial business travel reveals. Thus, with externality a successful business travel creates, in the trade etc. aimed travels to that country, an increase will be under consideration. The increase of trade aimed business travels from a country to other will also certainly lead to the increase of the holiday, recreation, rest, and recreation aimed travels. However, buying goods and services from a country will indirectly pioneer to the presentation and advertisement of that country in the home country. In addition, trade between countries will cause to increase of the consumers' interest to goods and services purchased and humans to be informed about products and the country, resources of that country. Hence,

the interest and famousness that earlier begin with the commercial relationships between countries will guide to the touristic aimed travels in the next stage (Kulendran and Wilson 2000, p. 1002).

In the light of explanations, the trade contented travels are also accepted as an important component of tourism (Eilat and Einav 2004, p. 1316; Shan and Wilson 2001, p. 279; Bahar and Baldemir 2008, p. 102). Despite the all disclosure, in many scientific contented studies carried out until today, the role that the trade play, as an important component of tourism demand function, is generally ignored. At this point, present paper differs from existing literature by investigating causation linkage between international trade and tourism by employing recently developed econometric techniques in sixteen Mediterranean countries.

The paper is divided into six sections and it organized as follows: Section 2 presents recent literature, while Section 3 presents data. Section 4 discusses the relevant methodological aspects. Section 5 presents empirical findings and Section 6 concludes and policy implications.

2. Literature Review

The literature which relates international trade and tourism, has been developing simultaneously. To our knowledge, the results of the first studies to explore the causation linkage are published by Gray (1970) and Keintz (1971). Recent studies by Webber (2000), Kulendran and Wilson (2000), Turner and Witt (2001), Khan, Rex, and Chua (2005), Kadir and Jusoff (2010), Santana-Gallego, Ledesma-Rodríguez, and Pérez-Rodríguez (2011) and Lionetti and Gonzalez (2012), among others, can be pointed out other than Gray (1970) and Keintz (1971). Most of them show that a cointegration between tourism and trade exists, and an analysis of the direction of causality is made. In fact, these studies are not the objective of the present paper. Nevertheless, studies analyzing the Tourism Lead to Growth TLG hypothesis include also trade variables with the aim of taking into account the relationship between tourism and trade. The relevant studies are presented by Table 1.

Table 1. *Literature review*

Relationship between Tourism and Trade: Time Series				
Authors and Date	Country	Period	Variables	Causality
Kulendran and Wilson, 2000	Australia USA, UK, N. Zealand, Japan	1982:1 - 1997:4	Holiday, business and total tourist arrivals, real imports, real exports	T↔ trade
Shan and Wilson, 2001	China	1987:1-1998:1	GDP, total trade, living cost, exchange rate	Trade →T T→ Trade
Katircioglu, 2007	Cyprus	1960-2005	GDP, tourist arrivals, real trade volume, exports, imports	Y→ Trade /Y→T Trade →T
Obadiahb et al., 2012	Kenya	1999-2012	GDP, tourist arrivals, trade	T→Y
Massidda and Mattana, 2013	Italy	1987-2009	GDP, tourist arrivals, total trade	Trade →T↔Y→ Trade
Oludele and Braimoh, 2010	South Africa	1980-2005	GDP, tourism receipts, exchange rate and exports	T→Y

Relationship between Tourism and Trade: Time Series				
Authors and Date	Country	Period	Variables	Causality
Nowak et al., 2007	Spain	1960-2003	GDP, tourism receipts, imports of industrial goods and machinery	T→ Capital Imports →Y
Bahar and Baldemir, 2008	Turkey	1980-2005	Tourist arrivals and export	T →Exports
Kadir and Jusoff, 2010	Malaysia	1995:1-2006:4	tourism receipts, exports, imports and total trade	Exports →T Imports →T Trade →T
Cortés-Jiménez et al., 2011	Tunisia	1975-2007	GDP, tourism receipts, imports	Y→T
Relationship between Tourism and Trade: Panel Data				
Santana-Gallego et al., 2010	179 countries	1995–2006	GDP, tourist arrivals investment, growth of population, human capital, openness to trade, exchange rate, currency union	T→Y Trade →Y

3. Data

In order to undertake the statistical analysis, data are assembled from WDI (World Development Indicators) databases. For the purposes of estimation, imports, exports and tourist arrivals are used. This study uses the sample selected Mediterranean countries: Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Arab Rep., France, Greece, Israel, Italy, Lebanon, Malta, Morocco, Slovenia, Spain, Tunisia and Turkey. The study uses the sample period 1995 to 2013, a period for which all relevant data are available.

4. Methodology

To determine the direction of causality between the variables of interest, we employ the panel data framework, because panel methods increase the power of tests in hypothesis testing. In examining causal linkages within the panel framework, two issues play a key role for selecting the appropriate causality tool. The first issue is to control for cross-sectional dependence across the members of the panel because a shock affecting one country may also affect other countries through the high degree of globalization and also international trade and financial integration. The Monte Carlo experiment conducted by Pesaran (2006) demonstrates the importance of testing for cross-sectional dependence in a panel data study and also illustrates the substantial bias and size distortions when cross-sectional dependence is ignored in the estimates (Pesaran, 2006). The second issue is to consider whether the data can be pooled across countries or whether panel estimates account for country specific heterogeneity (Pesaran and Smith, 1995; Luintel and Khan, 2004). First of all, the assumption that the slope coefficients are homogeneous is unlikely to hold because countries differ in their stages of development (Luintel and Khan, 2009). Furthermore, in a panel causality analysis, imposing the joint restriction for the whole panel is the strong null hypothesis (Granger, 2003) and assumes that homogeneity may mask the country specific characteristics (Breitung, 2005).

Therefore, testing for cross-sectional dependence and slope homogeneity in a panel causality analysis is a crucial step. We hereby begin by investigating whether there is

cross-sectional dependence and heterogeneity across the Mediterranean economies. In what follows, we outline the preliminary tests for cross-section dependence and slope homogeneity tests, before providing the details of the panel Granger causality test.

4.1. Panel Granger causality test

Testing causality in a panel framework has attracted interest during the last decade, and different approaches have been developed to examine the direction of causality in a panel data context. One attempt is based on estimating a panel vector autoregressive or vector error correction model by means of a generalized method of moments (GMM) estimator. This approach is, however, not able to consider either cross-sectional dependence or heterogeneity. GMM estimators, furthermore, can produce inconsistent and misleading parameters unless slope coefficients are, in fact, homogeneous (Pesaran et al., 1999).

The second approach proposed by Konya (2006) is sufficient to account for cross-sectional dependency and heterogeneity across cross-sections. This approach employs the seemingly unrelated regressions (SUR) estimation method developed by Zellner (1962) to control for contemporaneous correlations (cross-sectional dependency) and produces bootstrap critical values to make results robust irrespective of unit root and co-integration properties. Although Konya's testing procedure has attracted much interest in empirical applications, this approach includes a drawback for the panel data sets if the number of cross-sections (N) is not reasonably smaller than time periods (T) because the SUR estimator is only feasible for panels with large T and small N (Pesaran et al., 1999).

The third approach proposed by Dumitrescu and Hurlin (2012) is based on averaging standard individual Wald statistics of Granger tests under the assumption of cross-section independency. This approach, thereby, controls for heterogeneity but it is not able to account for cross-sectional dependence. The individual Granger causality analysis requires estimating vector autoregressive (VAR) models with stationary variables. The presence of non-stationary variables in VAR models may cause a nonstandard asymptotic distribution of Wald statistics based on unit root and co-integration properties where these nonstandard asymptotic properties arise from the singularity of the asymptotic distributions of the estimators (Lütkepohl, 2004, p. 148). To overcome this problem, Toda and Yamamoto (1995) developed an intuitive causality approach by augmenting the VAR model with the maximum integration degree of variables, which leads to valid Wald tests with asymptotic distribution irrespective of whether variables are non-stationary or co-integrated. Emirmahmutoglu and Kose (2011) extended the Toda-Yamamoto approach to Granger causality in time series data for panel data sets in a simple way. This approach to panel causality thereby accounts for cross-country heterogeneity irrespective of whether the variables of interest are non-stationary or co-integrated. In addition to this flexibility, because the critical values for panel statistics are derived from bootstrap distributions, it also considers the cross-section dependency.

In the Emirmahmutoglu and Kose approach, the following VAR model is estimated for each cross-section:

$$y_{it} = \mu_i + A_{1i} y_{i(t-1)} + \cdots + A_{p_i} y_{i(t-p_i)} + \cdots + A_{(p+d)i} y_{i(t-p_i-d_i)} + \varepsilon_{it}. \quad (8)$$

where y_{it} is vector of endogenous variables *(TOUR, EXP, IMP)*, $\boldsymbol{\mu_i}$ denotes the p dimensional vector of fixed effects, p_i is the optimal lag(s) and d_i is the maximum integration degree of the variables. The null hypothesis of no-Granger causality against the alternative hypothesis of Granger causality is tested by imposing zero restriction on the first p parameters. The so-called modified Wald statistic has the asymptotic chi-square distribution with p degrees of freedom. To test the Granger non-causality hypothesis for the panel, the Fisher statistic is developed that defined as:

$$\lambda = -2\sum_{i=1}^{N} \ln(\pi_i) \qquad (9)$$

where π_i is the probability corresponding to the individual modified Wald statistic. The Fisher statistic has an asymptotic chi-square distribution with $2N$ degrees of freedom. However, the limit distribution of the Fisher test statistic is no longer valid in the presence of cross-section dependency. To accommodate for cross-section dependency in the panel, Emirmahmutoglu and Kose (2011) suggest obtaining an empirical distribution of the panel statistic using the bootstrap method(1).

5. Empirical results

The results for the panel causality analysis(2) between tourism and export are presented in Table 2.

Table 2. *Causality between tourism and export*

		Tourism ≠> Export		Export ≠> Tourism	
Country	Lag(s)	Statistic	p-value	Statistic	p-value
Albania	1	4.242	0.039**	0.598	0.439
Algeria	1	1.079	0.298	0.356	0.550
Bosnia and Herzegovina	1	0.582	0.445	2.529	0.111
Croatia	3	4.152	0.245	2.973	0.395
Egypt, Arab Rep.	2	1.723	0.422	8.344	0.015**
France	1	3.416	0.064**	0.214	0.643
Greece	1	0.011	0.914	4.925	0.026***
Israel	1	0.389	0.532	1.486	0.222
Italy	1	5.305	0.021**	0.114	0.734
Lebanon	2	0.468	0.791	3.267	0.195
Malta	1	2.273	0.131	0.102	0.748
Morocco	2	4.515	0.104	8.285	0.015**
Slovenia	3	26.661	6.930	0.580	0.900
Spain	1	0.367	0.544	0.368	0.543
Tunisia	3	7.778	0.050**	8.461	0.037**
Turkey	1	2.217	0.136	0.005	0.942
Panel results	Fisher stat.	p-value			
Tourism ≠> Export	73.612	4.010			
Export ≠> Tourism	49.438	0.025**			

Notes: ≠> denotes non-Granger causality hypothesis. The optimal lag(s) are selected by Schwarz information criterion by setting maximum lags to 3 in VAR model. The bootstrap critical values are based on 1000 bootstrap replications. *, **, and *** respectively denote statistical significance at 10, 5 and 1 percent.

The Table 2 presents the causation linkage between tourism and export variables. In Albania, France, Italy and Tunisia, the hypothesis implying tourism does not cause of export is rejected. It means that uni-directional causality running from tourism to export exists in these countries. The significance level is 10%. On the other hand, the hypothesis claiming export does not cause of tourism is rejected for Egypt, Greece, Morocco and Tunisia. So it is clearly accepted that export causes tourism in Egypt, Greece, Morocco and Tunisia. Moreover, results indicate that there is a bi-directional causality for Tunisia. When the group effect took into account, it is realized that export is the cause of tourism.

Table 3. *Causality between tourism and import*

		Tourism ≠> Import		Import ≠> Tourism	
Country	Lag(s)	Statistic	p-value	Statistic	p-value
Albania	1	2.841	0.091*	0.766	0.381
Algeria	2	9.203	0.010***	2.123	0.345
Bosnia and Herzegovina	1	0.565	0.452	0.029	0.863
Croatia	3	0.526	0.913	22.458	5.240
Egypt, Arab Rep.	2	0.022	0.988	6.352	0.041**
France	1	1.208	0.271	0.681	0.409
Greece	2	7.264	0.026**	1.678	0.432
Israel	1	0.912	0.339	0.632	0.426
Italy	1	0.600	0.438	1.127	0.288
Lebanon	2	1.301	0.521	2.759	0.251
Malta	1	0.175	0.675	0.022	0.881
Morocco	3	10.200	0.016**	6.852	0.076*
Slovenia	2	5.315	0.070**	0.435	0.804
Spain	1	1.218	0.269	0.493	0.482
Tunisia	3	14.354	0.002***	15.448	0.001***
Turkey	3	4.981	0.173	7.228	0.064**
Panel results	Fisher stat.	p-value			
Tourism ≠> Import	63.155	0.000***			
Import ≠> Tourism	66.619	0.000***			

Notes: ≠> denotes non-Granger causality hypothesis. The optimal lag(s) are selected by and Schwarz information criterion by setting maximum lags to 3 in VAR model. The bootstrap critical values are based on 1000 bootstrap replications. *, **, and *** respectively denote statistical significance at 10, 5 and 1 percent.

In Table 3, findings indicating causation linkage between tourism and import is represented. According to analysis results, there is a uni-directional causality running from tourism to import for Albania, Algeria, Greece Morocco, Slovenia and Tunisia. The causation linkage from import to tourism is valid for Egypt, Morocco, Tunisia and Turkey. As a result, bi-directional causality is valid for Morocco and Tunisia. The group effect indicates that bi-directional causality exists.

6. Conclusion

The paper has analyzed the possible causation linkage between international trade and tourism arrivals for 16 Mediterranean countries by employing panel-Granger-causality tests over the annual data set from 1995 to 2013. The findings of the study indicate both two-way causality and unidirectional causality running between trade and travel for different countries.

Subject to possible caveats of the study, the following are some important policy implications for Mediterranean countries in terms of tourism and trade that can be drawn from the findings. It seems that an increase in international trade even if export or import, increases will cause growth in tourism sector, which means that most of tourist arrivals are related to tourism in especially developing countries such as Morocco, Tunisia, Algeria, Albania and Turkey. Hence, economic policy should focus more on trade related tourism, in order to generate more foreign trade earning to developing Mediterranean Countries. Besides, in order to increase and sustain in the growth of tourism sector, more attention should be given to the business tourism such as meetings, incentives, academicals, conferences, workshop and exhibitions.

Notes

(1) In order to save space, the details of bootstrapping method is not outlined here. An interested reader is referred to Konya (2006) and Emirmahmutoglu and Kose (2011).

(2) The causality procedure employed here first requires determining the maximum integration degree (d) of the series. Following Emirmahmutoglu and Kose (2011), we investigate the time series properties of the variables by means of the unit root test by Dickey and Fuller (1981) and find out that d is equal to one for each country in our panel. In order to save space, we do not report the results from the unit root analysis here but are available upon request.

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