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Foreign Direct Investment in Tourism: Panel Data Analysis of D7 Countries

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This paper uses the panel data of foreign direct investment (FDI) and tourism development (TD) for Developed 7 (D7) countries from 1980 to 2012. Panel data analysis is used in order to analyze the causal relationship between foreign direct investment and tourism development. Conducted structural and diagnostic test results of the final model has proved that tourism development affected the foreign direct investment in D7. It is crucial to see the directions of causality between these two variables for the policy makers. The findings of this study have important implications in deciding tourism policy and it shows that this issue still deserves further attention in future research.

Keywords: *Panel data, Foreign direct investment, Tourism development, Developed 7 countries*

Introduction

There have been large changes in aircraft technology, economic prosperity and international air service liberalization in the 1970s. These changes have contributed to the growth of international travel. The greatest changes took place after 1990 when globalization began to influence tourism (Işık 2012). Meeting a growing demand from tourism poses some critical challenges. According to United Nations (2007) tourism-related foreign direct investment (FDI) is largely concentrated in developed countries. These findings seem to contradict the above-mentioned perception that tourism-related FDI is extensive, and dominates the tourismindustry in developing countries.

The quick development of tourism in the world led to a growth of household incomes and government revenues directly and indirectly by means of multiplier effects, improving balance of payments and provoking tourism-promoted government policies. As a result, the development of tourism is typically viewed as a positive contributor to economic growth (Khan et al. 1995, Lee and Kwon 1995, Oh 2005, Akan et al. 2008).

The purpose of the paper seeks to obtain a better understanding of the extent to FDI in tourism of D7 countries by using time series and Pedroni panel data techniques (panel cointegration and causality) for the years 1980-2012. Understanding the relationship between foreign direct investment (FDI) and tourism assists policy makers in developing appropriate policies on tourism conservation. Thus, the objective of this paper is to re-examine the weak and

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strong relation between foreign direct investment (FDI) and tourism development (TD).

Literature Review

The literature review part presents causality relationship of foreign-direct investment (FDI) and tourism for multi-countries. Additonally, the causality relationship of variables demonstrate the way of the direction for different countries and different time periods.

The literature started with Granger's seminal work in 1969. The amount of literature covering tourism started slowly, but has developed rapidly in recent years.

Lanza et al. (2003) and Algieri (2006) empirically confirmed unidirectional causality running from growth to tourism in the case of 13 OECD and 25 high growth rate countries. This economic relationship is known as the growth-led tourism hypothesis in the literature. This hypothesis says that growth is an important dynamic influence for tourism.

On the other hand, Eugenio Martín et al. (2004), Fayissa et al. (2008), Lee and Chang (2008), Sequeira and Nunes (2008), Proenca and Soukiazis (2008), Cortés-Jiménez (2010), Narayan et al. (2010), Adamau and Clerides (2010), Santana-Gallego et al. (2010), Seetanah (2011), Holzner (2011), Nissan et al. (2011), Marrocu and Paci (2011), Apergis and Payne (2012), Dritsakis (2012), Caglayan et al. (2012) found evidence of unidirectional causality from tourism to growth in the case of 21 Latin, 42 sub-Saharan African countries, 23 OECD and 32 non-OECD countries, 4 Southern European countries, Portuguese regions, Italian and Spanish regions, 4 Pacific islands, 162 countries, 179 countries, 19 Islands Extended to 20 developing and 10 developed countries, 199 European regions, 9 Caribbean countries, 7 Mediterranean countries and 37 islands. This economic relationship is known as the tourism-led growth hypothesis in the literature. This case, tourism is an important impact factor for growth.

The originality of this paper lies in describing a new approach of FDI in tourism of 7 developed countries by using Pedroni panel data techniques. Pedroni (2001) model is developed that allows taking into account the type of effect between variables. The empirical evidence of variables from this study will allow thus to ensure a better guidance for academicians and policy makers.

Table 1. *Panel Data Literature Review*

Authors	Date	Country	Period	Variables	Causality
Lanza et al.	2003	13 OECD countries	1977–1992	GDP, tourism arrivals, total expenditure, price of manufactured goods, tourism price	(GDP)Y→T (Tourism) (unidirectional causality from growth to tourism)
Eugenio Martín et al.	2004	21 Latin countries	1985–1998	GDP, tourist arrivals, investment, government consumption, public expenditure in education, political stability index, corruption index	T→Y in low and medium income countries (unidirectional causality from tourism to growth)
Algieri	2006	25 countries	1990–2003	GDP, tourism receipts, price index, transport cost	Y →T if elasticity of substitution < 1 Y →T (unidirectional causality from growth to tourism, if elasticity < 1 and if it is not, (unidirectional causality from growth to tourism)
Fayissa et al.	2008	42 sub-Saharan African countries	1995–2004	GDP, tourism receipts, freedom index, human capital, investment, foreign investment, household consumption	T→Y (unidirectional causality from tourism to growth)
Lee & Chang	2008	23 OECD and 32 non-OECD countries	1990–2002	GDP, tourism receipts, exchange rate, tourist arrivals	T→Y OECD T↔Y non-OECD (unidirectional causality from tourism to growth for OECD and bidirectional causality between variables for non-OECD)
Sequeira & Nunes	2008	94 countries	1980–2002	GDP, tourist arrivals, tourism receipts	T→Y (unidirectional causality from tourism to growth)
Proenca & Soukiazis	2008	4 Southern European countries	1990–2004	GDP, tourism, population and technology growth rates	T→Y (unidirectional causality from tourism to growth)
Soukiazis & Proenca	2008	Portuguese regions	1993–2001	GDP, tourism receipts, accommodation capacity in the tourism sector	T→Y (unidirectional causality from tourism to growth)
Cortés-Jiménez	2008	Italian and Spanish regions	1990–2004	GDP, investment, human capital, government consumption, nights spent, national and international tourist arrivals	T→Y in coastal regions for national and international tourism T→Y in interior regions only for national tourism (unidirectional causality from tourism to growth)
Narayan et al.	2010	4 Pacific islands	1980–2005	GDP, tourism receipts, tourist arrivals	T→Y (unidirectional causality from tourism to growth)

Adamau & Clerides	2010	162 countries	1980–2005	GDP, 12 variables	T→Y (unidirectional causality from tourism to growth)
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 (unidirectional causality from tourism and trade to growth)
Seetanah	2011	19 Islands. Extended to 20 developing and 10 developed countries	1995–2007	GDP, tourist arrivals, tourism receipts, physical and human capital, openness, freedom index	T↔Y (bidirectional causality between variables)
Holzner	2011	143 countries	1970–2007	GDP, tourism receipts, physical and human capital, exchange rate, openness, taxes	tourism income in GDP
Nissan et al.	2011	11 countries	2000–2005	GDP, tourism expenditure, private and public investment, human capital, entrepreneurship, money supply	T↔Y E→T MS have negative effects on T (bidirectional causality between tourism and growth)
Marrocu & Paci	2011	199 European regions	1985–2006	total factor productivity, tourism flows, social capital, human capital, technological capital, public infrastructures, spatial dependence	T→TFP (unidirectional causality from tourism to total factor productivity)
Apergis & Payne	2012	9 Caribbean countries	1999–2004	GDP, tourist arrivals and exchange rate	T↔Y (unidirectional causality from tourism to growth)
Dritsakis	2012	7 Mediterranean countries	1980–2007	GDP, tourist arrivals and tourism receipts. exchange rate	T→Y (unidirectional causality from tourism to growth)
Ekanayake & Long	2012	140 developing countries	1995–2009	GDP, tourism receipts, physical capital and labor	–

Caglayan et al.	2012	135 countries	1995–2008	GDP, tourism receipts	T↔Y in Europe (bidirectional causality between tourism and growth) T→Y in America, Latin America & Caribbean (unidirectional causality from tourism to growth) Y →T in East and South Asia, Oceania – in the rest regions (unidirectional causality from growth to tourism)
Brau et al.	2007	143 countries	1980–2003	GDP, tourism receipts	T→Y (unidirectional causality from tourism to growth)
Singh	2008	37 islands	2006	GDP, tourism receipts	T→Y (unidirectional causality from tourism to growth)
Po & Huang	2008	88 countries	1995–2005	GDP, tourism receipts	T→Y (unidirectional causality from tourism to growth)
Figini & Vici	2010	150 countries	1980–2005	GDP, tourism receipts	

Note: Y: gross domestic product (GDP), t: tourism OECD: Organisation for Economic Cooparation and Development.
T→Y represent causality running from tourism to growth; Y→T represent causality running from growth to tourism; T↔Y represent bidirectional causality between tourism and growth.

Methodology

Model Specification and Data

In this study, foreign direct investment (FDI) and tourism development (TD) variables for D7[1] countries are conceptualized as an econometric model by using panel data analysis method over the period 1980-2012. Data are obtained from the World Bank. All the variables considered in the model are expressed in natural logarithms.

According to Pedroni there are 7 tests used for the co-integration. The first test is non-parametric test. The second and third tests are Phillips-Peron (PP) (rho) and PP (t). The fourth test is a parametric test called Augmented Dickey Fuller (ADF) (t). Finally, last two tests are PP (t) and ADF (t) (Pedroni 1995, Pedroni 1999).

The functional panel data model is as follows:

$$Y_{it} = \alpha + \beta_{it} X_{it} + \mu_i + \gamma_t + e_{it} \qquad 1$$

Where Y shows real GDP, α shows fixed effect, β shows long run eleticity, i=1,…, N denotes the number of country, t=1,…, T shows the time period, e_{it} = shows the stochastic error term.

In panel data, the one way fixed effects model is used. If there is time and section, the two way fixed effects model can be used for analysis (Baltagi 2005, Hsiao 1981). These are as follows:

$$Y_{it} = (a_{it} + \mu_i) + \beta_{1it} X_{1it} + ... + \beta_{kit} X_{kit} + e_{it}$$

$$Y_{it} = (a_{it} + \mu_i + \lambda_t) + \beta_{1it} X_{1it} + ... + \beta_{kit} X_{kit} + e_{it} \qquad 2$$

$$Y_{it} = a_{it} + \beta_{1it} + X_{1it} + ... + \beta_{kit} X_{kit} + (\mu_i + v_{it})$$

$$Y_{it} = a_{it} + \beta_{1it} + X_{1it} + ... + \beta_{kit} X_{kit} + (\mu_i + v_{it} + \lambda_t) \qquad 3$$

Empirical Results

Stationarity means that the mean and the variance of a series are constant through time and the auto-covariance of the series is not time varying (Enders 1995). In time series analysis, stationarity of the series is examined by unit root tests. Stationarity is very important for the time series

[1] D7: Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

analysis. A time series is stationary if its average and variance do not change in time. The common variance between two periods depends not on the calculated period but the distance between the periods (Engle and Granger 1987).

The variables (FDI and tourism) will be test for the stationarity. Different methods propose for panel data unit root analysis in the literature. In this study, ADF – Fisher Chi-square; Breitung t-stat; Im, Peseran and Shin W-stat; Hadri Z-stat; Heteroscedastic Consistent Z-stat; Levin, Lin & Chu t* and PP – Fisher Chi-square used for panel data unit root tests. Test results are shown in Table 2.

Table 2. *Unit Root Estimation Results for FDI and TD*

Method	**T Statistics [Prob.] for FDI**	**T Statistics [Prob.] for TD**
ADF–Fisher Chi-square	62.7642 [0.011]	38.2627 [0.8654]
Breitung t-stat	-4.2876 [0.000]	-4.58423 [0.004]
Im, Peseran & Shin W-stat	-2.6424 [0.006]	0.9642 [0.9212]
Hadri Z-stat	7.0905 [0.000]	8.18413 [0.000]
Heteroscedastic Consistent Z-stat	5.2802 [0.000]	8.5875 [0.000]
Levin, Lin & Chu t*	-0.1124 [0.8142]	-0.96436 [0.3315]
PP – Fisher Chi-square	62.7686 [0.6542]	61.5856 [0.8651]

Source: Author's estimations.

The unit root test was used to determine whether the variables used in regression equations are stationarity or not. As seen from Table 2, the series contains a unit root but is not stationary.

The next step is investigation of the panel and group Pedroni's co-integration estimation. Pedroni's co-integration estimation permits heterogeneity of individual slope coefficients. Test results are shown in Table 3.

Table 3. *Pedroni Co-integration Estimation Results for FDI and TD*

	T Statistics [Prob.]
Panel ADF-stat	-3.7634 [0.000]
Panel PP-stat	-3.1128 [0.002]
Panel rho-stat	-1.9180 [0.006]
Panel v-stat	1.6286 [0.302]
Group ADF-stat	-4.9886 [0.020]
Group PP-stat	-1.8824 [0.020]
Group rho-stat	0.068 [0.7264]

Source: Author's estimations.

According to Pedroni estimation, H_0: no Co-integration and H_1: Co-integration will be tested. As seen from Table 3, the null hypothesis was rejected in 5 tests and accepted in the remaining 2 tests.

Kao (1999) established residual based test for the null of no co-integration that do not pool the slope coefficients of the regression. Thus do

not constrain the estimated slope coefficients to be the same across members of the panel (Pedroni 2004: 600). Test results are shown in Table 4.

Table 4. *Kao Co-integration Estimation Results for FDI and TD*

	T Statistics (Prob.)
ADF	-0.9621 [0.2318]
HAC variance	0.003220
Residual variance	0.003818

Source: Author's estimations.

As seen from Table 4, the null hypothesis was accepted ($p>0.05$) and there is no co-integration relationship between variables.

The purpose of the Johansen Fisher co-integration estimation is to combine test statistics from individual cross-sections to obtain a test statistic for the full panel. Two different Johansen test will be used for the estimation. They are trace and maximum eigenvalue statistics. Test results are shown in Table 5.

Table 5. *Johansen Fisher Co-integration Estimation Results for FDI and TD*

Hypothesis	**Trace Statistic**	**95%**	**Max-eigen Statistic**	**95%**
r=0	98.1	0.0000	82.48	0.0008
r=1	92.2	0.0000	90.4	0.0000

Source: Author's estimations.

As seen from Table 5, Johansen Fisher Co-integration test show co-integration between variables. Most of the test show that a co-integration relationship exists, suggesting TD and FDI act together in the long term.

Table 6. *Fixed Effect Panel Data Estimation Results*

	Coefficient	**Standard Error**	**T-Statistic**	**Prob.**
C	1.432416	0.782105	1.781527	0.0713
TD	0.391547	0.027512	8.891654	0.0000
R^2=0.975	DW=0.312	F stat (prob.)=814.2(0.000)		

Source: Author's estimations.

As seen from Table 6, there is movement from FDI to TD (TD prob. value is 0.000 and smaller than 0.05 value). In terms of consistency of results, autocorrelation and heteroscedasticity must be tested by following the hypothesis H_0: no heteroscedasticity and H_1: heteroscedasticity.

Table 7. *Variable Variance LR and Wooldridge Auto-correlation Tests Results*

Test	**T-Statistic**	**Critical Value (0.05)**
Variable Variance LR	24.36	33.15
Wooldridge Auto-correlation	1.38	4.96

Source: Author's estimations.

As seen from Table 7, the null hypothesis was rejected meaning model is verified and not under the influence of the autocorrelation and heteroscedasticity problem.

The results of the panel analysis supports the feed-back effect between foreign direct investment and tourism development. Additionally, conducted structural and diagnostic test results of the final model has proved that tourism development affected the foreign direct investment in D7. The empirical findings from this study are support Lee and Brahmasrene (2013) and Endo's (2006) studies in the case of 27 nations of the EU and developed countries.

Conclusions

The research outcomes reveal that there is a significant correlation between foreign direct investment and tourism development (tourism development affected the foreign direct investment) in D7 countries for the 1980–2012 periods.

The ideal FDI policies should be developed towards improving the tourism efficiency consistent with the pace of economic growth in D7 countries. Since citizens living in these countries frequently engage in tourism, they have to invest in the tourist destination (infrastructure, technology, etc). D7 countries will also demand more FDI in future. Thus they must provide alternative capitals for the tourism production processes in order to increase and sustain tourism growth performance.

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