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Granger Causality and Dynamic Relationship Between the Actual Values of Receipts Derived from Tourism, National Income and Exchange Rates in Selected Countries with Tourist Attraction

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Abstract: Revenue from tourism as part of the gross domestic product of host country, directly affects the economic growth of that country. The travel cost to the destination country decreases and the willingness to travel to that country increases with the increase in the real exchange rate. The aim of this study was to examine the granger and dynamic causality between the actual receipts of the tourism variables, real national income and the real exchange rate in the period of 1995-2011. In the selection of the countries of the Mediterranean sea, Southeast Asia, Latin America and Iran by using Generalized Method of Moments (GMM). In general the results of Granger causality test indicate that all three types of mutual short and long time and strong causality are between the two by two studied variables. Also estimation of the relationships of long-term results confirmed by the vector error correction model show that the coefficients of real national income and real exchange rate have positive relationship with the dependent variable of real receipts from tourism. Also real exchange rate as the dependent variable has the negative relationship with national income and vice versa and the real exchange rate and national income each one as the dependent variable has a significant and positive relationship with actual receipts from tourism.

Key words: Mediterranean sea, tourism, receipts, Latin, (GMM)

INTRODUCTION

Today, paying attention to the tourism industry in international dimension is one of the most important economic goals of countries in the world because through proper and planned investments in the infrastructures of this industry not only we will be witness the arrival of international tourists as a result, we will be witness the arrival of a large inflows of Foreign exchange resources, but also the interior spaces created for citizens of the region will have positive outcomes. The international tourist arrival rate in the world from 438 million in year of 1990 has reached to 880 million in year of 2009 and as well as the income from tourism in the world from 264 milliard dollars in 1990 has reached to 852 milliard dollars in 2009 (UNWTO, 2010). Based on the formal forecast of the World Tourism Organization (UNWTO) the number of tourist arrivals of world will reach 1.5 milliard people up to year of 2020.

Due to twenty-year view of the Islamic Republic of Iran it is necessary that the Iran's share of number of world tourists toincrease from 0.09% in 2004-1.5% in 1404 the final year of outlook horizon means to absorb annually around twenty million tourists from the world market (to board approved of ministers in 2004).

Regarding the importance of accelerating economic growth in order to as soon as possible increase the welfare in country and thepotential ability available in tourism sector as one of the economic sectors that can help to increase national income on the one hand and also the effect of the real income from tourism on the exchange rate and as a result of its impact on the external sector of country on the other hand, it seems that the study of the causal relationship between real national income, real income from tourism and the exchange rate has particular importance and necessity in the current situation of country. So in order to fill the existing vacuum of studies, in this study by using dynamic panel data is tried to examine the two by two causality relationship between these three variables in countries of the Mediterranean sea, Southeast Asia, Latin America, along with Iran over the years of 1995-2011 and the following hypotheses are tested:

- There is bilateral Granger causality relationship between variables of real national income and real exchange rate
- There is bilateral Granger causality relationship between variables of real receipts from tourism and real exchange rate

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- There is bilateral Granger causality relationship between variables of real national income and real receipts from tourism

The theoretical framework of research: In this study, also the purpose of the international tourism is the tourism that actually includes Foreign travels. In March 1993, the UN Statistical Commission adopted the proposed definition of tourism by the World Tourism Organization. Based on this definition, tourism is defined as "activities of people who travel to places outside of their living and working place to rest and relax and do other things and stay there less than one consecutive year" (Namin, 2009).

The most important direct effect of entering the international tourism on the national economy is through injecting money and demand of Foreign sources. This increase of tourism and as result increase revenue from tourism acts as increase the export (Balaguer and Cantavella-Jorda, 2002). In addition to the positive impact of tourism in a country, tourism industry can reduce the occurrence of economic problems in metropolisesby preventing irregular migration of poor communities with tourism attraction to the metropolises (Dritsakis, 2004).

According to Oh (2005), tourism industry can have a significant impact on increasing employment, incomes associated with residential areas and also government revenues of countries. Thus, tourism affects in both direct and indirect way on economic growth. In the direct effect, whatever the number of international tourists increases to a country also increases the income of that.

On the other hand, Foreign direct investment also is effective on tourism development because with the development of tourism facilities and infrastructures including transportation and roads development and information and communication technology development as well as development of residential areas, restaurants and hotels causes to develop the tourism industry (Oh, 2005; Elahi *et al*., 2015; Hanifi *et al*., 2014). Tourism indirectly also effects on growth, because shows the dynamic effect on the whole economy in the form of spillovers or other externalities. However if the tourism boom due to great interaction with other economic sectors, causes to move other economic activities that offer goods or services to this sector or consume its product also along with it (Yavari *et al*., 2010).

About the effects of real exchange rate on tourism Foreign exchange income can be expressed that by increasing the real exchange rate (depreciation of the domestic currency), reduced travel costs to the destination country and increases people's willingness to travel to the country of destination. So the real exchange rate has a positive impact on tourism demand (Feshari *et al*., 2012). With quick look at revenues from international tourism this result can be achieved that look of governments to tourism is placed in the first degree of importance in economic development. The main reason for this is fast-growing of tourism and achieving the largest situation of service industry in world that can be imported huge financial resources into the national economy.

Literature review: Hlafi (2007) studied the effect of the real exchange rate on economic growth in Iran during the years of 1959-2004 by using Generalized Auto Regressive Conditional Heteroseedasticity (GARCH). The results showed instability and deviation of real exchange rate in all models has had negative impact without time delay on economic growth of Iran.

Feshari *et al*. (2012), study the kind of impact of tourism Foreign exchange income tax rate in the Middle East and North Africa by using dynamic panel data approach during the years 1995-2009. Their results shows tax rate has a negative impact on tourism revenue and tourism Foreign exchange revenue lagged variables, per capita income and per capita income growth have significant and positive impact on tourism revenues.

Fayissa *et al*. (2007) have studied the impact of tourism on economic growth and development by using consolidated data for 42 African countries over the years 1995-2004 within a neoclassical framework. The results showed tourism receipts help significantly to both the current level of gross domestic product and economic growth in Sub-Saharan Africa, in the form of investment in physical and human capital. African countries can raise their short term economic growth by strategic strengthening the tourism industry.

Cortes-Jimenez (2008) have investigated the probable impact of tourism (including both domestic and Foreign tourism), on economic growth by focusing on two famous countries by tourism attractions (i.e., Spain and Italy) during the periods of1990-2004 and by using geographic locations criteria. The results showed that both domestic and international tourism have a significant positive impact on the regional economic growth. So that, domestic tourism in Spain and international tourism for Italy are more important factor in economic growth.

Kreishan (2010) investigated the causal relationship between economic growth and tourism revenues for Jordan in the period (1970-2009). He found based on collective tests of Johansen and Juselius and Granger causality that there is a positive relationship between

tourism and economic growth in the Jordan country also causal relationship between these two variables of tourism is toward to economic growth.

MATERIALS AND METHODS

This study examines the causality relationship between real national income, the real exchange rate and the actual receipts from tourism in the country with tourist attractions. On this basis territory of this investigation will be limited to Iran and the countries of the Mediterranean, Southeast Asia and Latin America. The time domain of this study is from 1995-2011.

Information and data required to conduct this research have been collected and categorized by referring to the World Bank's World database with the title of World Development Indicators. In this study to data analysis are used statistical indicators and econometric methods by using Stata 12 Software.

Model and econometric method: In this research to test the causal relationship between the three variables actual receipts of the tourism, real national income and the real exchange rate, first, long-term relationships in the form of bilateral fixed effects models, followed by it the error correction model based on these long-term relationships can be defined as follows:

$$\ln TR_{it} = \alpha_i + \mu_t + \alpha_{1t} \ln Y_{it} + \alpha_{2t} \ln RER_{it} + \varepsilon_{1t} \quad (1)$$

$$\ln Y_{it} = \beta_i + \mu_t + \beta_{1t} \ln TR_{it} + \beta_{2t} \ln RER_{it} + \varepsilon_{2t} \quad (2)$$

$$\ln RER_{it} = \gamma_i + \mu_t + \gamma_{1t} \ln TR_{it} + \gamma_{2t} \ln Y_{it} + \varepsilon_{3t} \quad (3)$$

$$\Delta \ln TR_{it} = \alpha_0 + \lambda ECM^{*}_{it-1} + \sum_{j=1}^{p} \alpha_{1j} \Delta \ln TR_{it-j} + \sum_{j=0}^{q} \alpha_{2j} \Delta \ln Y_{it-j} + \sum_{j=0}^{q} \alpha_{3j} \Delta \ln RER_{it-j} + e_{1t} \quad (4)$$

$$\Delta \ln Y_{it} = b_0 + \lambda ECM^{**}_{it-1} + \sum_{j=1}^{p} b_{1j} \Delta \ln Y_{it-j} + \sum_{j=0}^{q} b_{2j} \Delta \ln TR_{it-j} + \sum_{j=0}^{r} b_{3j} \ln RER_{it-j} + e_{2t} \quad (5)$$

$$\Delta \ln RER_{it} = c_0 + \lambda ECM^{***}_{it-1} + \sum_{j=1}^{p} c_{1j} \Delta \ln RER_{it-j} + \sum_{j=0}^{q} c_{2j} \Delta \ln TR_{it-j} + \sum_{j=o}^{r} c_{3j} \Delta \ln Y_{it-j} + e_{3t} \quad (6)$$

Where:

In Tr_t	=	Natural logarithm of real receipts from tourism of per capita
In Y_t:	=	Natural logarithm of real national income per capita
In RER_t	=	The natural logarithm of the real exchange rate
p, q, r	=	Symbols of during interruptions
ECM*,**,***	=	Errors resulting from estimation of long-term models (equal to ε_1, ε_2, ε_3)
e_{it}	=	Dsturbing element
t	=	Symbol time periods
I	=	A symbol of country
Δ	=	The difference symbol of first order

In order to achieve data for this variables for real national income per capita variable has been used the data of per capita gross domestic product at constant prices of 2005 for variable of per capita real income from tourism from international tourism income data per capita in current prices divided in the consumer price index (100 = 2005) for each country and for the real exchange variable the current official exchange rate to the dollar multiplied the ratio of the consumer price index of America to the consumer price index of the related country.

One of appropriate econometric methods to solve or reduce the endogenous problem of institutional indicators and the correlation between institutional variables and other explanatory variables is estimation the model by using GMM for panel data that is known as dynamic panel data method. Caselli *et al.* (1996) for the first time used GMM panel data estimation method to estimate the economic growth models.

Application of GMM method of panel data is advantages like considering the heterogeneity within group (cross-sectional) and more information, remove bias in the cross-sectional regressions that its result will be more accurate estimates with higher efficiency and less linearity. To create insurance of the accuracy and reliability of instrumental variables in estimation method GMM, there are two tests. One of these tests is Sargan test to detect Valid over Identifying Restrictions the model. The second test, correlation test is the first rate (1AR) and wastes are second rate (2AR).

Arellano and Bond consider that in the estimation of GMM, residuals should have the first order serial correlation (1AR) and has no second-order serial correlation (2AR) (Mohammadi and Tirgi, 2013). So by considering the expressed benefits for estimating

3 models of vector error correction presented in 4-6 relations is used of that method and then Ganger causality test is conducted through the implementation the Wald test that has the ability to examine the constraints imposed on the estimated coefficients obtained from this procedure.

RESULTS AND DISCUSSION

Stability test of variables: Since, the most common panel unit root tests have been established on the basis of distribution independently then in heterogeneous panel data that there is the possibility of inaccuracy of this assumption, first needs to examine the correlation of wastes among sections through boys sectional independence test by null assuming the lack of correlation of errors at the same time between the sections.

In this case verification dependency sections to each other leads to become invalid the common unit root tests and should be used the modified stability test of Pesaran (2007) for these conditions. Since boys cross-sectional independent test results presented in Table 1 indicate the existence of dependence between wastes in between sections in all three examined models at the level of error less than one percent, So in order to stability test of variables to study the lack of spurious regression in estimation method of panel data is used boys stability test (2007) shaped in the form of cross-sectional Augmented Dickey Fuller (CADF) shown in Table 2.

The main advantage of this test is that it is simple and intuitive that often has led to use macroeconomic variables for panel unit root test. The H0 hypothesis was based on existence the unit root test in such way that values, Show stability in all three levels of studied variables and lack of possibility to occur the conditions of spurious regression in the level of error of <5%.

Model estimation: Naturally many economic relations are dynamic and one of the benefits of panel data in cross-country regressions is that allows researchers to better understand the dynamics of adjustment. These dynamic relationships are specified with the interrupted dependent variable between explanatory variables. In this case to estimate is used GMM estimator model. For this purpose at first estimation long-term models is performed by Eq. 1-3 by using bilateral fixed effects for each of the three variables as the dependent variable. The results show the being meaningless some coefficients and existence auto correlation and heterogeneity of variance.For this purpose, again by making harmonious the variables than standard deviation of errors, each of the sections in each of the three models to solve the problem of heterogeneity of variance and first order autocorrelation in the error of preliminary estimation was performed the estimation of three models in two-way fixed effects approach that the statistical results from final estimation have been reported in Table 3.

Table 1: Result of boys sectional independent test

Dependent variable	Test statistic	Probability level
LnTR	6.597	0
LnRER	26.614	0
LnY	55.231	0

Table 2: Evaluation the stability of variables based on pesaran test

	Without time trend			
Variables	No of interruptions	Z [t-bar]	p-value	Results
LnTR	0	-3.07	0.001	Steady
LnRER	0	-2.086	0.018	Steady
LnY	2	-2.058	0.02	Steady

Research findings by using the stata software

Table 3: The results of long-term models estimation by using bilateral fixed effects

Variables	Dependent variable	Independent variable	Coefficients	t-values	p>t
		LnRER	0.366013	23.50	0
Ultimate estimation	LnTR	LnY	1.190250	23.12	0
		LnY	-0.714810	-22.19	0
	LnRER	LnTR	0.136836	23.66	0
		LnRER	-0.066550	-29.19	0
	LnY	LnTR	0.028020	20.09	0

In next stage, the delayed obtained errors from the three estimations (ECM^{***}_{t-1}, ECM^{**}_{t-1}, ECM^{*}_{t-1}), respectively was entered into each of the three models VECM and each model separately is estimated by using GMM. As can be seen in Table 4, the results of GMM estimation method indicate significant coefficients between 0 and -1 for ECM delayed variables that imply on confirmation of estimated long-run relations.

In addition estimated results on the actual receipts from tourism as the dependent variable show that at confidence level of 95% all coefficients are significant and It can be said that in the short time delayed coefficient of differential variables real exchange rate and real national income have a positive impact on the actual receipts from tourism. Results when the first order difference variable of real exchange rate is as the dependent variable, suggests that all the variables at a confidence level of 95% are significance.

In this equation, negative coefficients related to the first order difference variable of national income represent a negative effect of this variable on the real exchange rate. Also, results obtained from GMM estimation on the first order difference of the real national income as the dependent variable show that First order difference variable of real national income with two interruptions is significant at 95% confidence level and the interrupted value of the first order difference variable of real receipts from tourism is significant at level <90% confidence shown in Table 4.

Table 4: Results of estimation the VECM models by GMM method for each of the dependent variables

Dependent variables	Explanatory variables	Coefficient	Z	p>|Z|
$\Delta InTR_t$	$\Delta LnTR_{t-1}$	0.1416272	6.22	0.000
	$\Delta LnRER_t$	0.3420807	24.43	0.000
	$\Delta LnRER_{t-1}$	0.1951153	11.32	0.000
	ΔLnY_t	1.5833681	13.06	0.000
	ΔLnY_{t-1}	0.2955185	2.06	0.039
	ECM^*_{t-1}	-0.9237419	-25.33	0.000
Sargan test 0 = 1.000				
Autocorrelation	P[AR(1)] = 0.0328		Z =-2.1345	
test errors	P[AR(2)] = 0.1893		Z = 1.3125	
	$\Delta LnRER_{t-1}$	0.1243838	20.26	0.000
	ΔLnY_t	-1.2317250	-33.41	0.000
	ΔLnY_{t-1}	-0.0564604	-2.41	0.016
$\Delta InRER_t$	$\Delta LnTR_t$	0.1588518	10.15	0.000
	$\Delta LnTR_{t-1}$	0.9702360	28.70	0.000
	ECM^{**}_{t-1}	-0.39522184	-20.21	0.000
Sargan test = 1.000				
Autocorrelation	P[AR(1)]= 0.0183		Z = -2.3597	
test errors	P[AR(2)]= 0.8427		Z = 0.19845	
	ΔLnY_{t-1}	0.418179	2.39	0.017
	ΔLnY_{t-2}	-0.0859574	-7.25	0.000
	$\Delta LnRER_{t-1}$	-0.1011809	-12.92	0.000
ΔInY_t	$\Delta LnTR_{t-1}$	-0.0323567	-6.88	0.000
	$\Delta LnTR_t$	0.3465960	10.26	0.000
	$\Delta LnTR_{t-1}$	0.0001379	0.05	0.959
	ECM^{***}_{t-1}	-0.2964237	-17.92	0.000
Sargan test 0 = 1.000				
Autocorrelation	P[AR(1)] = 0.0002		Z = -3.7458	
test errors	[AR(2)] = 0.71870		Z = -0.36135	

Table 5: Statistics x^2 calculated for the dependent variables

Dependent variables	Type of causality	Variables of under examined	χ^2	Prob.
	Short term	ΔLnY_t, ΔLnY_{t-1}	170.62	0
	Strong	ΔLnY_t, ΔLnY_{t-1}, ECM^*_{t-1}	749.79	0
	Long time	ECM^*_{t-1}	641.53	0
LnTR	Short term	$\Delta LnRER_t$, $\Delta LnRER_{t-1}$	692.41	0
	Strong	$\Delta LnRER_t$, $\Delta LnRER_{t-1}$, ECM^*_{t-1}	1682.51	0
	Type of causality	ΔLnY_t, ΔLnY_{t-1}	1262.67	0
	Short term	ΔLnY_t, ΔLnY_{t-1}, ECM^{**}_{t-1}	3018.96	0
	Strong	ECM^{**}_{t-1}	408.63	0
	Long time	$\Delta LnTR_t$, $\Delta LnTR_{t-1}$, ECM^{**}_{t-1}	833.22	0
LnRER	Short term	ECM^{**}_{t-1}	2399.34	0
	Type of causality	$\Delta LnTR_t$, $\Delta LnTR_{t-1}$,	170.47	0
	Short term	$\Delta LnRER_t$, $\Delta LnRER_{t-1}$, ECM^{***}_{t-1}	268.11	0
	Strong	ECM^{***}_{t-1}	140.27	0
	Long time	$\Delta LnTR_t$, $\Delta LnTR_{t-1}$	183.44	0
LnY	Short term	$\Delta LnTR_t$, $\Delta LnTR_{t-1}$, ECM^{***}_{t-1}	478.10	0

Granger causality test: To test the mentioned hypothesis, uses the Wald test on the coefficients of estimated VECM models by GMM method. Based on the principles of this test, if the null hypothesis is denied based on being zero simultaneous for estimated coefficients for each independent variable, being meaningful and existence of causality from that independent variable to the dependent variable. In the short term causality, only the coefficients of differential variables associated with each independent variable are tested in the model, in strong causality; ECM variable coefficient with differential variable coefficients associated with each independent variable in the model simultaneously and in the long causality (i.e., from the all independent variables to the dependent variable) through ECM delayed variable coefficient alone, the results of which have been presented below shown in Table 5.

The results of Wald tests as sample on VECM parent with dependent variable of real receipts of tourism, firstly indicate a short term one-way causal relationship of the first order difference variables of real national income and real exchange rate, Secondly, strong causality respectively from each of the first order difference variables of real national income and real exchange rate separately and thirdly, the confirmation of long-term causality from the real national income and the real exchange rate of both variables towards of this variable. Similarly for two dependant variables of real national income and the real exchange rate and the related ECMs are governed similar to these relations. Accordingly, it can be generally stated that, according to Wald test results reported in Table 4 for each of the variables as the dependent variable, is established the Granger causality relations of short term, long term and strong between each

two of the three variables studied in error level <1% in fact, all three mentioned hypotheses are fully realized.

CONCLUSION

Reported results of the estimation of short-term model suggest a negative and reversed relationship between real exchange rate and real national income. So that with 1% increase in the real exchange rate 0.1% decreased of the real national income. Ranjpour *et al.* (2011), in their research study also found that the real exchange rate has had a negative and significant impact on gross domestic product of Iran. It is seen that a 1% increase in real national income, the real exchange rate reduces -1.23% that it is economically significant and is in the concept of increase in national income against the reduction of national currency of Iran and indicates the negative and reversed impact of the real exchange rate on economic growth. The first assumption is confirmed in this case.

According to the presented results of the estimation of research model has been identified that real exchange rate coefficient is statistically significant in the short-term and has positive effect on the real receipts derived from tourism. This study is matched with the obtained results of Dristakis (2004) show that between exchange rate and revenues from international tourism over the period 1960-2000 in Greece, there are significant causal relationships. According to the findings of research, 1% increase in the real exchange rate has been followed increasing of real receipts from tourism to the 0.34%. Accordingly, it can be said that the second hypothesis is accepted andconfirmed. Feshari *et al.* (2012) have also concluded that the incensement of real exchange rate can be increased tourism. Foreign exchange income in the MENA region, the field of tourist arrivals. Based on short-term results, the actual variable coefficient of tourism, had been positive and statistically quite significant so that the 1% increase in receipts of tourism in gross domestic product per capita, increase the value of 0.34.

According to the results, being significant of real national income variable coefficient suggests statistically that with 1% increase in real national income, real receipts of tourism increase as much as 1.58% in the studied countries. Therefore it can be concluded that there is Granjer causality relationship between real receipts of tourism and real national income that causes to develop the tourism industry and economic growth. In general it can be concluded that the according to results of the estimation of VECM models by GMM method, there was bidirectional causality relationship in the short term and the long term with strong causality between real receipts of tourism, real exchange rate and income real national in studied countries, including the countries of the Mediterranean, Southeast Asia, Latin America, along with Iran during the years 1995-2011.

This finding is also confirmed by the estimated long-run relations. On the other hand, results showed a bilateral positive and significant relationship between the real receipts of tourism and real national income. Real exchange rate has a negative and significant impact on real national income. Therefore, in accordance with the results of this research and to improve the environment for international tourism in the studied countries advertising according to the tastes of tourists by using new tools in the field of advertising, such as satellite and internet and correct advertising and marketing strategies, introducing the monuments and tourist attractions, establishing entertainment big centers and residential centers and convenient shopping malls for tourists in order to attract more Foreign tourists can have a great impact in increasing Foreign exchange earnings.

Due to the negative impact of the real exchange rate on real national income and vice versa, policies and measures of governments in the studied countries should be used to strengthen the national currency to have a positive effect on economic growth. This growth, in turn, can also lead to the development of tourism industry. But at the same time governments to prevent the reducing effect of strengthen national currency on revenues from tourism should act to improve the quantity and quality of services offered in the tourism sector, causes to increase the willingness of tourists to travel to their countries.

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