

The Role of Tourism Activity in Economic Growth by Using Some Econometric Models Evidence from Jordan

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Abstract

Tourism is used as a vital strategy to reach greater economic productivity. The aim of this paper is to investigate the dynamic relationship between tourism growth and economic growth, using annual time series data from Jordan over the period (1990-2016). The study used a variety of methods based on the Cobb-Douglas production function, the Koyck geometrical lag model, cointegration analysis, error correction model and causality analysis. We reveal if tourism leads to economic growth or growth leads to tourism development or bidirectional relation exists between two variables. According to the results, there are moderately increasing return to scale in tourism sector. In addition to there is a positive long-term equilibrium relation related to growth with both fixed assets and tourism balance. The results of the Granger causality test have demonstrated the unidirectional hypothesis, where tourism development leads to economic growth. This paper presented a set of suggestions that would improve Jordan's competitiveness in tourism.

Keywords: economies of scale, return to scale, balance tourism, fixed asset, Granger causality, cointegration, Koyck model

1. Introduction

Tourism activity plays an important role in achieving a high level of economic development in economic today. It is a major source of income in Jordan. Jordan's gross domestic product (GDP) includes 7.5% of the tourism sector. The tourism sector is a vital service sector and the fastest-growing sector in the world.

Recently, Jordanian has considered tourism as a unique economic activity to stimulate the development of overall economy. The Jordanian Strategic Plan for the Tourism Sector (2018-2022) focused on the development of the tourism sector in order to improve the competitiveness of the Jordanian economy and sustain its growth. (Ministry of Tourism-Jordan). Jordanian economy is suffering from many problems associated with structure of macroeconomics represent of deficit in balance of trade, deficit in balance of payments, high unemployment, limited foreign earnings, poverty, high inflation and external shocks. thus, The Jordanian government determine tourism as a key sector to stimulate economic performance by improving efficiency and increasing productivity. Tourism sector can play effective role to help policymakers by increasing tourism receipt, create positive externality backward and forward linkages to other economic sectors. (Cernat and Gourdon 2012), (Tugcu 2014). It expands investment opportunities and creates positive return to scale and scope (Croes 2006).

In addition to mention, Tourism sector can play substantial impact on economic growth by accumulating foreign exchange earnings, destroying poverty, promoting export trade and attracting foreign direct investment. (Scheyvens and Russell 2012). Economists believe that the fast growth of the tourism sector sustains the growth of national income and enhancement in the balance of payments. (Oh 2005). This paper aims to explain the type of causal relation between tourism activity and growth and investigates the sources of economic growth by estimating the Cobb-Douglas production function of tourism service sector, also this paper estimates determinants of growth by using Koyck distributed lag model.

Balaguer and Cantavella-Jorda (2002) was the first person who examined hypothesis that the tourism led growth. (Tugcu 2014). Tourism sector affects growth by various channels first, Tourism provides the necessary funding that helps to cover the deficit of balance of payments. (Nowak et al 2007) second, tourism plays important role in investment, creates best opportunities jobs in hotels, restaurants, complementary sectors and supporting activities

such as transport, travel and shipping agencies; Third, Tourism stimulates the attraction of foreign direct and indirect investment, and localization of modern technology; (Cernot and Gourdon 2012), (Spurr 2009). fourth, Tourism stimulates the establishment of industries related to the tourism sector such as handicrafts, traditional, flower industry and sand glass; fifth, tourism creates backward and forward linkages, economies of scope and encourages vertical integration between industries. (Croes 2006).

The main hypothesis in this paper explores the contribution of Jordan tourism to economic growth by determining the direction of its relationship.

Above stated the study problem, the rest of the paper includes part 2 consists of economic studies and literature associated with the study. Part 3 presents the data and Methodology. Part 4 Discuss and analysis the results of econometric method, Lastly part 5 conclusion and recommendations.

2. Literature Review

There is a large number of studies at the global level that examine the linkages between tourism and economic growth. The tourism sector is a major component of Jordan's GDP and contribute to its development. Several studies have examined the existence of unidirectional causality links the growth of tourism activity with the high levels of economic growth (Brida, Lanzilotta and Pizzolon 2016), (Devitra and Kyaw 2016), (Husein and Kara 2011). This hypothesis show that increases in tourist number, increases in tourist receipts, increases in balance tourist lead to increases in national income and increases investment tourism industry which stimulates economic growth by creating new jobs, inducing backward and forward linkages between tourism and other sectors. Ivanov and Webster (2013) emphasized the one-way relationship by demonstrating the positive role of tourism on real growth in one hundred and sixty-seven nations. Bouzahasah and El Menyari (2013) have proven the validity of this hypothesis in the short-run in both Tunisia and Morocco, while the relationship is reflected in the long term. Ohlan (2017) confirmed unidirectional causality which related tourism activity to economic growth and positive impact between financial development and tourism in India. Chulaphan, and Barahona (2018) investigated whether the expansion of tourism activity contributed to the economic growth of Thailand or an inverse relationship where the economic growth in Thailand leads to the growth of tourism sector, This study were used time series techniques, cointegration and causal tests Granger.

In contrast, other studies favor that economic growth led to tourism growth (Aslan 2013), The reversed hypothesis refer to economic growth causes tourism development suggest that increase capital investment in all sectors in the economy motivates increases in tourist demand and lead to tourist development. On the other hand, number of studies uphold for bidirectional causality which suggest that interdependent and complementary between economic growth and tourism development. This assumption can be explained by interactions between tourism and other sectors of the economy, so that the investments in tourism industry motivates overall economic growth and vice versa. (Lean and Tang 2010), (Ridderstat et al 2014), (Brida et al 2015), (Seghir et al 2015), (Tang and Ozturk 2017).

Other studies revealed no causality between tourism growth and economic growth such as:

(Merida and Golpe 2016), (Tugcu 2014). The neutrality hypothesis due to the growth in tourism independent from economic growth and the tourism is not vital component of overall economic activities. Few studies found that there is negative relationship between tourism development and growth, these studies due to Dutch disease (Mieiro and Ramos 2010).

Studies conducted for the Middle East countries such as (Tang and Abosedra 2016) examined hypothesis the tourism are driving growth for Lebanon, the results found the tourist led growth. Kreishan (2010) examined the effect of tourism on economic growth in Jordan, the main finding refer to unidirectional causality. Razaq and Masarwah (2006) explained the impact of tourism sector on the Jordanian economy. The main result is the tourism receipts played vital role in the most important economics variables. Divino et al (2015) analyzed the Brazilian tourism Cobb-Douglas production function. Hamidatou Nacer & Nasr Hamidatou (2015) investigated impact of tourist activity in Algeria on economic growth by using the Cobb-Douglas production function method.

The most important characteristic of this study is comprehensiveness and the use of three econometrics methods linked to the study goal, which is unique in using Koyck geometrical distributed lag model.

Table 1. Selected Literature review, Tourism led economic Growth Hypothesis uni-directional

Auther	period
Zortuk	2009
Payne and Mervar	2010
Brida, Jimenez and Pulina	2016
Tang and Tan	2013
Bandula and Jayathilake	2013
Belloumi	2010
Kibara, Odhiambo and Njuguna	2012
Bouzahzah and El Menyari	2013
Deng, Ma and Shao	2013
Kareem	2013
Lee and Brahmaasrene	2013
Dritsakis	2013
Fayissa, Nsiah and Tadasse	2008
Jin	2011
Katircioglu	2010
Surugiu	2013
Isik	2012
Katircioglu	2009
Zuo and Huang	2017
Li, Jin and Shi	2018

Table 2. Selected Literature review -Interdependendet between tourism and growth (bidirectional)

Auther	period
Gharttey	2013
Corrie, stoeckl and Chaiechi	2013
Lee and Kwag	2013
Trang, Duc and Dund	2013
Aslan	2013
Apergis and Payne	2012
Nissan, Galindo and Mendez	2011
Lee and Chien	2008
Khalil, Mehmood and Waliullah	2007
Dogru and Bulut	2018

3. Data and Methodology

The aim of this paper is to revealed and investigated the dynamic relationship between tourism growth and economic growth in Jordan for the period starting from 1990 and finishing 2016. This study uses annual data on variables Real gross domestic product(RGDP) Which measuers overall economic growth of the Jordan, Labour(L) is expressed of Labour cost, Capital or Fixed Assets(FA)is expressed of average book value of fixed assets, Balance tourism(BT)is expressed of the difference between receipts and expenditures of the tourism. The time series data of RGDP, L, FA, BT Variables on annual bases have been colected from the Jordanian department of statistics

(DOS), data base on Jordanian economy and from tourism statistics published by Ministry of tourism , government of Jordan.

Three econometric methods were used to identify the relationship between tourism and economic growth:

3.1 Estimate cobb-Dogluas production function of tourism services by using annual data of value added in tourism sector, Labour component was expressed of Lobar costs, Capital or Fixed Assets was expressed of Average book value of fixed assets. The objective was to measure economies of scale in the tourism sector and identify sources of growth related to tourism.

$$\text{Value added} = A L^\alpha K^\beta$$

3.2 This paper uses geometrical distributed lag model (Koyck Method) to establish the dynamic Link between receipts tourism and economic growth.

Koyck model assumes that the weights of independent variables lagged in time are gradually decreasing with geometric progression according to the law:

$$\beta_j = \beta_0 \delta^j$$

$$0 < \delta < 1$$

Where δ : Coefficient of deceleration or response speed.

β_j : constantly decreasing, $\delta < 1$ as time passes.

The effect of the time lag variable decreases on the dependent variable.

Koyck ingenious model of lag variables is derived from the original model, Which contains only a lag variable exogenous variable , according to this formula:

$$Y_t = a + B_0 X_t + B_1 X_{t-1} + B_2 X_{t-2} + \dots + B_5 X_{t-5} + U_t \quad (1)$$

$U_t \sim N(0, \sigma^2)$

$$Y_t = a + B_0 X_t + \delta B_0 X_{t-1} + \delta^2 B_0 X_{t-2} + \dots + U_t \quad (2)$$

To make model lag one period:

$$Y_{t-1} = a + B_0 X_{t-1} + \delta B_0 X_{t-2} + \delta^2 B_0 X_{t-3} + \dots + U_{t-1} \quad (3)$$

Multiply terms of Equation on δ

$$\delta Y_t - 1 = \delta a + \delta B_0 X_t + \delta^2 B_0 X_{t-1} + \delta^3 B_0 X_{t-2} + \dots + \delta U_t - 1 \quad (4)$$

Subtract Equation 4 from Equation 2

$$Y_t - \delta Y_{t-1} = a - \delta a + B_0 X_t + U_t - \delta U_{t-1} - 1$$

$$Y_t - \delta Y_{t-1} = a(1-\delta) + B_0 X_t + U_t - \delta U_{t-1}$$

$$Y_t = a(1-\delta) + B_0 X_t + \delta Y_{t-1} + V_t$$

$$\text{New Error term is } V_t = (U_t - \delta U_{t-1})$$

Thus Koyck model after omit constant term became:

$$Y_t = B_0 X_t + \delta Y_{t-1} + V_t$$

3.3 This section aims to examin if the tourism activity drive economic growth or vice versa or has a neutral effect or that there is a bidirection relationship between them. The analysis is carried out using the method of cointegration and the error correction model, by estimating the long-term relationship between economic growth and its determinants (tourism-related study variables) and by Granger's causality test.

4. Discuss and Analysis the Results

4.1 Production Function Model

Analysed Production function methods have been based on statistical data from (1990-2016)

Q: is output or value added in tourism sector

L: is Labour cost in tourism sector

K: is capital (Fixed assets) in tourism sector.

$$\text{Log val} = \text{Log } a + b \text{ Log } L + c \text{ Log } K$$

$$= -.015 + 1.22 \log L - 0.08 \log k$$

t (-1.0) (26.1) (-3.5)

$R^2=0.90, F = 671.1, D.W=1.72$

We can conclude from this result that the tourism sector has increasing return to scale at moderate rate which equal (1.30). This result is consistent with its findings of Shi(2011)who shows that there is evidence of increasing returns in transport, retail trade and recreational services at the tourism industry in Ausralian.(Shi and Symth 2011).

4.2 (Koyck Method) Geometrical Distributed Lag Model

$$Y_t = B_0 + B_1 Y_{t-1} + B_2 R_t + U_t$$

R_t: Return or Receipt tourism.

Y_t:Real gross demostic product.

$$RGDP = 527.3 + 0.27R_t + 0.86Y_{t-1}$$

t 3.3 2 15.9

P-value 0.002 0.05 0.0000

$$Y_t = \alpha * + B R_t + \partial Y_{t-1} + V_t$$

$$\alpha^* = \alpha (1 - \delta)$$

We can get the estimation of value parameter of lag variable and represent the short –run impact of tourism Which equal = 0.27

1) The long-run impact calculate according to this Formula:

$$LR = \alpha^* \div (1 - \partial) = 527.3$$

An increase of 10% in tourism revenue leads to an increase in Real gross domestic product of 52.73% over the long term.

2) impact in short run:

a) Median lag= $\text{Log}2 \div \text{Log}\partial = 4.6$ approxmatly four months.

Represent the time required for 50% from change Y_t as result of change of R_t by one unit.

b) Average Lag = $\partial \div 1 - \partial = 6.14 \sim$ six months, measures the speed of response to changes in tourism receipt Which equal six months.

c) variance Lag = $\partial \div 1 - \partial^2 = 0.86 \div 1 - 0.2604 = 3.3$ months.

The variation in the lag period is expressed by the difference between the actual period and the estimated period.

d) intercept $\alpha^* = \alpha \div (1 - \partial) = 527.3 \div (1 - 0.86) = 3766.4$

e) The weights of lag variables compute as formula: $W_i = (1 - \partial)^i$

W₁= 0.14 , W₂ = 0.02

We can note that with two years, tourism receipt contributes 16% to real GDP Change.

The Koyck model was estimated based on estimated informat and weights as follows:

$$Y_t = 3766.4 + 0.270 R_t + 0.14 Y_{t-1} + 0.02 Y_{t-2} + V_t$$

4.3 As an important stage of time series Practical test, In the beginning we define the degree of integration for each variable followed in the study. The unit root stationary test and the Dicky – Fuller test were used for this goal . The findings of these tests are shown in Table (3). Since the values of the ADF statistic are less than the critical value at a significant level of 5%, we reject the null hypothesis that there is no root unit . thus, the series is stable at the first difference. hence, the variables are stationary and integrated at first order.

Table 3. Results of stationary and integrated variables

Variables in their First Differences with Trend and intercept	ADF statistics	Critical values	Decision
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Real GDP	-5.69	At 1%: -4.37 At 5%: -3.60	Reject Null Hypothesis
Balance	-6.04	At 1%: -4.37 At 5%: -3.60	Reject Null Hypothesis
Fixed Assts (capital)	-5.50	At 1%: -4.37 At 5%: -3.60	Reject Null
Sources: Eviews (9)			

The second stage, Johansens Trace and Maximum Eigenvalue tests have been completed in order to measure the cointegration between stationary variables. Table (3) shows the results of the Dicky- Fuller test. The cointegration equation at 5% level of significance has been found by trace test. In addition to the maximum eigenvalue test occurs the asseration of this finding. Hence, There is a long –term equilibrium relationship between variables. But in the short –term variances may be occurred, thus, we have to investigate if disturbances covers to the long term equilibrium or not. The error correction model is used to determine the direction of the causal relationship in the short and long term between variables in the model and to estimate the speed of reaching the long-term equilibrium. Error correction model is a process to addressing the disturbances and matching the relation between short term and long term.

Table 4. Results of Johansens Cointegration test

Number of cointegrating	Eigen value	Trace statistics	Critical value At 5% P-value
*none	0.3303	29.91	29.79 P-value:0.74
At most 1	0.1558	5.45	15.49 P-value:0.75
At most 2	0.0474	1.21	3.84 P-value:0.27

*Denotes rejection of the hypothesis at the 5% level.

Table (4) Results of Johansens Cointegration test

Number of cointegrating	Eigen value	Maximum statistics	Critical value At 5% P-value
*none	0.3303	22.16	21.13 P-value: 0.74
At most 1	0.1558	4.24	14.26 P-value: 0.83
At most 2	0.0474	1.21	3.84 P-value: 0.27

*Denotes rejection of the hypothesis at the 5% level.

We must choose a suitable lag length in order to estimates a vector error correction model (VECM). We should determine number of lags in the model based on Schwaarz information Criterion(SIC). The required length of lag is 2 to reduce (SIC).

Estimates for VECM Regressions:

$$D(RGDP) = -0.537589\Delta Balance(-1) - 0.82\Delta Balance(-2) - 0.02\Delta Fa(-1) - 0.52\Delta Fa(-2) - 0.05RGDP(-1) + 2.12RGDP(-2) - 0.6$$

$$t \quad \quad \quad (-5.2) \quad \quad (-4) \quad \quad (-0.24) \quad \quad (-0.44) \quad \quad (0.00017)$$

$$Balance(-1) + 0.79\Delta Balance(-2) - 0.17\Delta Fa(-1) + 0.13\Delta Fa(-2) - 0.039$$

$$(-2.6) \quad (4.5) \quad (-2.2) \quad (1.95) \quad (-1.11)$$

The adjustment parameter is (-53.76). It indicates that the gross domestic product (GDP) is adjusted in period (t) by (53.76%) from the disequilibrium value in the period (t-1) (About 4.5 years) towards its long-term equilibrium value after the impact of the shock in the model. The speed of the adjustment of the equilibrium is slow.

When gross domestic product (GDP) deviates in the short term from its long-term equilibrium value, the equivalent of 53.76% of this disequilibrium is corrected in period (t).

The presence of cointegration reveals the presence of Granger Causality at least in one direction. The value of error correction coefficient shows the presence of long-term causality between the variables of the research. The results in table (5) show the unidirectional causality relationship from the balance of tourism and fixed assets in tourism to economic growth.

Table 5. Results of Granger Causality test

Null Hypothesis	F-statistics	Probability	Decision
$\Delta Balance$ does not Granger Cause $\Delta RGDP$	2.87	0.08	accept
$\Delta RGDP$ does not Granger Cause $\Delta Balance$	0.65	0.53	accept
ΔFa does not Granger Cause $\Delta RGDP$	0.05	0.95	accept
$\Delta RGDP$ does not Granger Cause ΔFa	0.86	0.43	accept
ΔFa does not Granger Cause $\Delta Balance$	0.41	0.67	accept
$\Delta Balance$ does not Granger Cause ΔFa	0.91	0.41	accept

Source: researcher.

The findings in Table (5) illustrate that all the null-Hypothesis are accepted at 5% level of significant. These findings confirm the result received from VECM related to the non-presence of short term casualty at significant 5%.

5. Conclusion and Recommendations

Jordan has many potentials and tourism opportunities that qualify it to compete with neighboring countries in the region, It includes all aspects of tourism such as historical tourism and religious tourism. The government plays an important role in providing adequate infrastructure, promoting tourism activity and providing many facilities and logistics services.

Tourism returns are used to import capital goods and fixed assets that are used in the production of goods and services, finance imports and contribute to reducing trade deficit, payments and budget deficit. In addition to tourism investment is encouraged to increase the forward and backward linkages through the establishment of supporting investments such as banks, exchange companies, restaurants, hotels and various entertainment places. All these factors lead to economic growth in the host country. In this paper, a variety of econometric methods, including the time series approach, have been used to illustrate the impact and type of relation between tourism and economic growth in Jordan. Tourism was expressed by the variables of tourism balance and fixed assets, and economic growth was expressed in real GDP.

The value added in the tourism sector influence of the economic growth in Jordan through the economies of scale of the production function, which were measured in this study and show that it is characterized by increasing return to scale moderately, and this provides opportunities for the tourism sector to exploit the possibilities available to achieve economies of scale, reduce costs and improve competitiveness.

This paper uses geometric distributed lag model (Koyck Method) to establish the dynamic link between receptions tourism and economic growth. The Quick model shows that tourism revenues contribute to a real GDP change of 16% over two years.

Estimating the long-run equilibrium relation between economic growth and independent variables related to tourism requires verification of the stationarity of the time series, the study was used Augmented-Dickey fuller unit root test which demonstrate that all variables series are I(1).

The findings of the cointegration test depend on Johansen's method reveal the presence of the cointegration between variables. Thus, The error correction model takes into account the short- and long-term dynamic interaction between economic growth and its determinants. The estimation of vector error correction model depend on VAR reveal the presence of long-term unidirectional casualty running from balance tourism to real GDP in the long-term.

The results of this paper supports the tourism-led growth hypothesis, this applies to a small economy such as the Jordanian economy has some comparative advantages in tourism and attractive investment environment, but this result may vary over time and with other countries. This result is consistent with the long-term and stable relationship between tourism activities and real GDP growth in Jordan. With more clarity, When tourists activities or events increase, the GDP growth rate enhances by increasing in the balance tourism and fixed assets from tourism sector.

The Jordanian tourism sector suffers from many marketing obstacles, promotional aspects of the tourist product, administrative and institutional obstacles, shortage of funding, reduction of tourism investment and fluctuation of return from the tourism industry. The most important challenge is the weak competitiveness of the tourism industry due to the high prices of tourism services compared to other countries, the burden of heavy taxes and poor exploitation of tourism resources.

According to the results and to meet the challenges in the tourism sector, the study adopts a number of recommendations to stimulate the growth of tourism in Jordan :First, the policymaker in tourism sector must set up an integrated tourism promotion plan to attract the largest number of tourists from all over the world by targeting religious tourism such as the Nebo mountain in Madaba, Jordan river, which is the river where Jesus was baptized. Second, Maximizing the returns and benefits of tourism resources by enhancing the quality of national tourism services and enhancing the methods of tourism marketing; Third, attracting high-spending foreign tourists; fourth, developing and targeting medical tourism through partnerships with international medical institutions and e-promotion; Fifth, Maximize the utilize of agreements with the countries of the world to promote tourist sites in Jordan, attract tourists to these sites and provide discounts for large tourist groups; Sixth, Establishment joint projects between the public and private sectors to stimulate tourism investment; Last, Improve the competitiveness of tourism in the Jordanian economy by reducing taxes and fees on tourism activities, as well as decreasing the prices of tourism services.

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