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## **TOURISM AS A FACTOR OF ECONOMIC GROWTH: AN EMPIRICAL ANALYSIS FOR ARMENIA<sup>1</sup>**

In recent years, the question of whether tourism contributes to long-run economic growth has been widely discussed in the touristic literature, but the results of empirical research remain conflicting. The Tourism-led growth hypothesis (TLGH) has been introduced, according to which international tourism is a strategic factor of economic growth in the long run. The COVID-19 pandemic reaffirmed the need for countries to test this hypothesis empirically as most countries recognize the crucial role of tourism in economic recovery. If the TLGH is valid, more resources should be allocated to the tourism industry than it was before.

This study investigates the causal relations between tourism development (TD) and economic growth for the Armenian economy by using econometric methodology of unit root testing, cointegration analysis, Granger causality testing and Vector Autoregression (VAR) modeling. The results of a cointegration test indicate that there is no long-run equilibrium relationship between real

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GDP and real tourism receipts. Our findings have also empirically demonstrated that Tourism-Led Growth Hypothesis (TLGH) is not held in the case of Armenia. The outcomes of Granger causality test imply a bilateral causal relationship between tourism development and economic growth. TD-economic growth short-run interactions were estimated using the VAR model.

**Key words:** tourism development, economic growth, empirical analysis, Tourism-Led Growth Hypothesis, Unit root test, cointegration, Granger causality.

## Introduction

Over the past decades the significance of tourism industry for the economy of many countries have steadily increased. According to the World Travel and Tourism Council Economic Impact Reports over the past nine years the global average annual GDP growth rate in the tourism sector has been 3.5%, exceeding the average global GDP growth rate of 2.5%. In 2019 tourism accounted for 10.3% of world GDP providing 10% of total employment or every 4th new job (WTTC Economic Impact Reports, 2019).

The Tourism-led growth hypothesis argues that international tourism is a potential strategic driver of economic growth. The debate over whether tourism generates long-run economic growth goes beyond the national level, with differing views (Ridderstaat et al. 2013). On the one hand, tourism receipts can boost the economic growth of a country through their positive influence on the economy as a whole (Marin 1992). Considering the benefits of tourism (providing significant foreign exchange earnings; creating new jobs; promoting investment in a country's infrastructure; developing other sectors of the economy), we can assume that TD is a positive factor for the country's economic growth (Modeste 1994). The World Tourism Organization and the World Travel and Tourism Council strongly support the notion that tourism can play an important role for developing countries in terms of economic growth (Cortés-Jiménez et al. 2009).

In December 2015, the United Nation General Assembly declared 2017 as the International Year of Sustainable Tourism for Development, emphasizing the potential of tourism sector to lead „economic growth“ (UNWTO 2016, p. 9). On the other hand, the World Bank, which has an influential role in financing tourism projects, underestimates the ability to stimulate and direct the economic potential of tourism (Hawkins & Mann 2007). Sequeira and Campos (2005) argue that on average the growth rate of countries specializing in tourism compared to countries that do not specialize in tourism is inconsistent with economic theory as in particular endogenous growth theory suggests that economic growth is connected: (1) with high-intensity R&D (Research and Development) sectors, (2) with large-scale.

The relationship between TD and economic growth has been widely studied in the literature, but the question of whether tourism generates economic growth in the long run is still inconclusive. Additional empirical studies on this issue can

help identify the link between tourism and economic growth. At the same time, the TLGH validation test provides an empirical basis for government decisions on how much resource to allocate to the tourism sector.

The tourism sector is one of the priorities for the Armenian economy. At least during the last fifteen years, reforms and investments have been made in the sphere of tourism in Armenia, the impact of which has been positive. In 2005–2019, the number of tourists visiting Armenia increased almost 6 times (from 318 thousand to 1894.377 thousand tourists), and the income from tourism – about 6.7 times (from 230.5 million USD to 1534.9 million). The growth rate of tourists arriving in Armenia in 2019 was 14.7%, and the GDP growth rate of the tourism sector was 4.7%, exceeding the average growth rate of 3.5% of the world tourism sector's GDP. In 2019 tourism accounted for 11.8% of Armenia's GDP providing 12.5% of the total employment (124.6 thousand jobs). In 2020 the COVID-19 epidemic had a significant negative impact on the number of tourists arriving to Armenia (a reduction of 80.2%). Although the COVID-19 epidemic forced major adjustments in tourism development plans in 2020, inbound tourism in Armenia is expected to retain its role as the second largest export sector (Republic of Armenia, 2014–2025 Strategic Long-Run Development Plan).

The purpose of this study is to determine the contribution of TD to Armenia's economic growth. More specifically, this investigation attempts: (1) to verify the validity of the TLGH hypothesis in the case of Armenia; (2) find out the direction of TD–economic growth causation; (3) assess TD–economic growth interactions.

The importance of this research is in its outcome, which can provide significant information for strategic planning and policy formulation by both the government and tourism businesses (Chen & Chiou-Wei, 2009).

## Methodology

The VAR model was estimated using quarterly data over the period of the first quarter of 1997 through the first quarter of 2020. To investigate the relationship between TD and economic growth the variables used here are real tourism receipts (RTourrec), real GDP (RGDP), both in millions of Armenian dram, and real effective exchange rates (index, 1997=100, REER). Tourism receipts, in US\$ million, variable was converted to Armenian dram and to real terms (1997=100) using Armenian dram/US\$ nominal exchange rates and the consumer price index (CPI) as a deflator. The CPI was also used to convert nominal GDP to real GDP (1997 = 100). The GDP data of the early years (1998–2012) are from the Statistical Committee of the Republic of Armenia. Data after 2012 is from the Central Bank of Armenia. We took the data on tourism from both the Central Bank of Armenia and the Tourism-Committee-of-RA, real effective exchange rates data was used from the Central Bank of Armenia.

Quarterly time series data of real GDP and real tourism receipts is seasonal so it has been smoothed. The variables are then transformed through the use of natural logarithm. Coefficients in log function are interpreted as elasticities that are

a percentage change in a dependent variable given a 1% change in an independent variable. The data for the second to fourth quarters in 2020 were not used in the analysis as the sharp decline in tourism revenues (a result of the COVID-19 epidemic) makes them outliers.

Before specification and estimation of VAR and VEC models, it is required to examine the stationarity of the variables. A wrong choice of transformation of the data gives biased results and has consequences for wrong interpretation (Engle & Granger 1987). Therefore, the first step is to test the order of integration of the variables (Enders 1995; Enders 2010). This study employs the Augmented Dickey-Fuller test (ADF) and the Phillips-Perron test (PP) to examine whether the data are nonstationary (Dickey & Fuller 1979; Phillips & Perron 1988). The ADF test estimates the following equation (Gujarati & Porter 2009):

$$\Delta X_t = \beta_1 + \gamma X_{t-1} + \beta_2 t + \sum_{i=1}^k c_i \Delta X_{t-i} + \varepsilon_t \quad (1)$$

where  $\beta_1, \beta_2, \gamma, c_i$  are coefficients,  $t$  is the time or trend variable,  $\varepsilon_t$  is the random error representing the ‘white noise’ process. ADF tests the hypothesis  $\gamma = 0$ , which means that the time series has a unit root and is therefore not stationary. Phillips-Perron (1988) developed the (Augmented) Dickey-Fuller test modification allowing for fairly mild assumptions about error distribution (Enders 2010).

If the time series  $X_t$  and  $Y_t$  represent process I(1) and their linear combination is I(0) process (stationary), then the variables  $X_t$  and  $Y_t$  are integrated: there is a long-run or balanced interdependence between these variables (Granger 1981; Engle & Granger 1987).

We have built several VAR models that meet the condition of stability (all descriptive roots of the model must be less than one in absolute value). The best model was based on the Akaike information criterion (AIC) and the Schwarz information criterion (SIC) minimum values. The Johansen Cointegration Test (Johansen 1988) for the selected VAR model tested for long-run stable relationships between variables. Trace and Maximum Eigenvalue tests were used for integration analysis.

If there are integration connections, it is advisable to use the VEC model. The essence of the VEC model is as follows: the error correction mechanism ensures the establishment of a long-run relationship between the variables. The equilibrium error is used to correct the imbalance. If there is no integration connection, it is advisable to use the VAR model. The VAR model for the two endogenous variables is represented by the following equations:

$$Y1_t = \alpha_1 + \sum_{j=1}^k \beta_{1j} Y1_{t-j} + \sum_{j=1}^k \delta_{1j} Y2_{t-j} + \sum_{k=1}^K \gamma_{1k} X_k + u_{1t}$$

$$Y2_t = \alpha_2 + \sum_{j=1}^k \beta_{2j} Y1_{t-j} + \sum_{j=1}^k \delta_{2j} Y2_{t-j} + \sum_{k=1}^K \gamma_{2k} X_k + u_{2t}$$

where  $Y1_t$  and  $Y2_t$  are endogenous variables,  $X_k$  is exogenous. It is assumed that  $u_{1t}$  and  $u_{2t}$  are ‘white noise’ processes.

Breusch–Godfrey Serial Correlation LM and Breusch–Pagan–Godfrey Heteroskedasticity tests were used to test the residual independence and homoscedasticity of the models, respectively.

Granger (Granger 1988) noted that if two variables are cointegrated, there must be at least one one-way causation. The Granger causality test allows to determine the presence and direction of causality between two variables. Suppose the following regression equations are evaluated in the model:

$$\Delta LR GDP_t = \sum_{i=1}^n \alpha_i \Delta LR GDP_{t-i} + \sum_{j=1}^n \beta_j \Delta LRTourrec_{t-j} + u_{1t}$$

$$\Delta LRTourrec_t = \sum_{j=1}^n \gamma_j \Delta LRTourrec_{t-j} + \sum_{i=1}^n \delta_i \Delta LR GDP_{t-i} + u_{2t}$$

where  $u_{1t}$  and  $u_{2t}$  are uncorrected random errors,  $\alpha_i, \beta_j, \gamma_j, \delta_i$  are coefficients. The null hypothesis (LRTourrec is not the reason for the change in LR GDP according to Granger) is not rejected if  $\beta_1 = \beta_2 = \dots = \beta_n = 0$ . In this case, the null hypothesis (LR GDP is not the reason for the change in LRTourrec according to Granger) is not rejected if  $\delta_1 = \delta_2 = \dots = \delta_n = 0$ .

The Adj.R\_sq was used to evaluate the quality of the models, and t, F, Chi\_sq statistics were used to test the statistical significance of the estimated parameters and hypotheses.

## Results

The economic impact of tourism has been studied by many authors and still remains an important field of research (Jennings 2009). The number of empirical studies on the economic impact of tourism has increased in the last decade. Dhakal (2016) shows that there is a long-run relationship between the number of international tourists arriving in Nepal, the average cost per visitor and the length of his stay. A study by Fernandes et al. (2018) reveals the causal link between tourism, trade and currency purchasing power in Brazil, and assesses the impact of innovation on them. Ren et al. (2019) studied the impact of tourism revenue on economic growth and environmental pollution for eight Mediterranean countries. Kronenberg and Fuchs (2021) studied the impact of tourism on regional employment and income for Swedenrs Jämtland region .

The main factors influencing the tourism demand (number of tourist arrivals) in the tourism models are the per capita income in the country of origin of the tourist, relative prices in the countries of origin, exchange rates, transport costs, tourism infrastructure, security perceptions (Albaladejo et al. 2014; Gunter and Önder 2015; Santana–Gallego et al. 2016; Pham et al. 2017). The literature on the

economic impact of tourism is so diverse that some authors find it necessary to systematize it (Comerio & Strozzi 2019; León-Gómez et al. 2021).

The first empirical study of the tourism–economic growth interaction was conducted by Ghali (1976). This was followed by Lanza and Pigliaru (2000). Starting from the paper published in 2002 by Balaguer and Cantavella-Jordà, the ‘Tourism–Led Growth Hypothesis’ began to be widely discussed in the literature. Pablo-Romero and Molina (2013) conducted a chronological analysis of the empirical research on TLGH, classifying articles according to the methodology used (time series, panel data and cross-sectional data).

Empirical research in a number of countries *confirms the validity of the TLGH*. Balaguer and Cantavella-Jordà (2002) conducted a cointegration analysis based on real tourism revenues, real productivity rates, real GDP, and showed that tourism development contributes to Spain’s economic growth in the long run. Novak et al. (2007) proved that TLGH is not rejected using the Granger causality test and the Vector Error Correction (VEC) model for Spanish tourism export and economic growth data. For Spain, TLGH was revised and verified by Perlis-Ribes et al. (2017) in the light of the global financial crisis in 2008 and the Arab Spring uprisings. Cortes-Jimenez and Pulina (2010) studied the TLGH for Spain and Italy using the cointegration method and multidimensional Granger causality test. The results of the analysis show that tourism plays an important role for the economies of both countries, and TLGH is confirmed.

Notable work on TLGH for Mexico (Brida et al. 2008), Chile (Brida and Risso 2009), and South Tyrol (Brida and Risso 2010) has been the work of Brida et al.. Based on the country’s tourism spending, real exchange rate and real GDP data, using co-integration analysis, they have shown the positive impact of tourism on long-run economic growth for Mexico and Chile. Using data from the real GDP, the number of foreign visitors, and relative prices between South Tyrol and Germany, Brida et al. found that tourism in South Tyrol contributes to long-run economic growth, but economic growth is not the cause of tourism growth. Tagsu (2014) shows that the effects of tourism on economic growth are relatively greater in economies with poorer initial conditions. Summarizing the alternative approaches to TLGH, he suggests several directions related to the relationship between GDP and tourism. Hatemi (2016) and Brida et al. (2016), analyzing the alternative directions of TLGH proposed by Tagsu, distinguish: 1) feedback hypothesis, which means the interdependence between tourism and economic growth, 2) neutrality hypothesis, which is based on the idea that tourism does not affect economic growth, 3) conservation hypothesis, according to which economic growth contributes to the development of tourism.

Ridderstaat et al. (2013) used the VEC model to study the role of tourism in the Aruba economy and showed that TLGH is validated. Using cointegration–causation tests, Durbarry (2004) and Louca (2006) validate TLGH for the islands of Mauritius and Cyprus, respectively. Manzoor et al. (2019), by conducting a regression–integration analysis, show that tourism has a positive and significant

impact on Pakistan's economic growth as well as on employment and there is a long-run relationship between the variables being studied. Using the quantum regression models for the eight Mediterranean countries, Ren et al. (2019) found that tourism revenue plays an important role in promoting economic development for all quantiles. The results of the Autoregressive Distributed Lag (ARDL) models confirm that tourism revenues have a positive impact on economic growth.

There are some studies showing that economic growth contributes to the development of tourism (*Economic-Driven Tourism Growth Hypothesis – EDTGH*). Tang and Jang (2009) conducted a cointegration analysis based on gross sales revenue from four different US industries and GDP data, and showed that sustainable economic growth in the United States is contributing to tourism development. Similar empirical evidence has been obtained by Oh (2005) for South Korea. The results of the integration test based on the data of real GDP and real income from tourism showed that there is no long-run equilibrium between the two time series. The results of the Granger causality test suggest a one-way causal relationship between economic growth-based tourism growth.

An alternative to TLGH is the *Neutrality Hypothesis (NH)*, which is based on the idea that there is no link between TD and economic growth. Based on a large number of countries' per capita income, telephone per 1000 population, literacy rate, life expectancy, index of economic freedom, arrivals of international tourists data in 1995, Du and Ng (2011) show a lack of relation between TD and economic growth using regression analysis. Sequeira and Campos (2005) conclude that tourism alone cannot explain the higher growth rates of countries specializing in tourism using the panel data method for research in a number of countries. Using cointegration and causal analysis, and VECM, Kasimati (2011) show no link between tourism and economic growth based on real GDP, arrivals of international tourists in Greece, real effective exchange rate data. Orsini and Pletiskova (2019), investigating the Croatian tourism industry, concluded that tourism development in Croatia is not likely to crowd out other tradable sectors. However, in order to ensure long-run economic growth, tourism is unlikely to be as important as trade openness. Katircioglu (2009) conducted a cointegration analysis based on Turkey's real GDP, real effective exchange rate, international tourist arrivals, and applied ARDL model. The results of the study showed a lack of long-run link between tourism and economic growth. A study by Lee and Chien (2008) found a lack of long-run relation between tourism and economic growth for Taiwan.

There are a number of studies that show a reciprocal link between tourism development and economic growth (*Reciprocal Hypothesis – RH*). Sitanah et al. (2011) obtained a reciprocal link between TD and national income based on data from 40 African countries using the Vector Autoregression panel model. Chen and Chiou-Wei (2009) conducted a study for Taiwan and South Korea using data for real tourism revenue (South Korea), international tourist arrivals (Taiwan), real exchange rates, and real GDP. The authors for Taiwan found that international tourism contributes to economic growth in the long run, and in the case of South

Korea, there is a two-way link between tourism and economic growth.

Using the OECD and non-OECD countries per capita real tourist income, per capita international tourist arrivals, real effective exchange rate and real GDP per capita data, Lee and Chang (2008) have shown that tourism in non-OECD countries has a greater impact on GDP than in OECD countries. Panel integration test, panel Granger causality test and VEC model was used. The panel causal test showed unilateral causal links from tourism development to economic growth in OECD countries, bilateral causal links in non-OECD countries, and weak links in Asia.

Dritsakis (2004), in contrast to Kasimati, found that there is a two-way causality for Greece’s economic growth and TD using Granger’s causality analysis test. Using the VEC model based on real GDP, revenue from real international tourism and real effective exchange rate, he showed that the TD contributes to the long-run economic growth of the country. These contradictory results for Greece, in particular, show that despite the extensive literature on the relationship between tourism and economic growth, the debate over whether tourism is a driver of long-run economic growth remains unresolved.

The TLG hypothesis of tourism development–economic growth interaction for Armenia has not been studied to our best knowledge.

### Discussion

Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests were employed to test the non-stationarity of the variables. These tests are evaluated with 3 different zero hypotheses: Random Walk, Random Walk with Drift and Random Walk with Drift and Trend. Before testing the stationarity, we chose the model type based on the usual least squares method. The optimal lags are based on the minimum of the AIC and the SIC. For the Tourism receipts variable we have chosen a model including an intercept and a trend, and for the Real effective exchange rate and Real GDP a model including an intercept. The results of testing the order of natural logarithm of RGDP, RTourrec and Reer are provided in Table 1. The tests strongly supported the null hypothesis of non-stationarity before differencing the variables and the first differenced series of LRGDP, LRTourrec and LReer were stationary based on the Unit root tests. Therefore, the variables were expressed to be I(1).

Table 1: Unit root test results

Variable	Augmented Dickey–Fuller Null of non-stationarity	Phillips–Perron Null of non-stationarity
LRGDP	-1.675	-1.883
d(LRGDP)	-11.826*	-12.317*
LRTourrec	-2.487	-2.487
d(LRTourrec)	-6.809*	-14.367*
LREER	-1.313	-1.588
<b>d(LReer)</b>	<b>-8.475*</b>	<b>-7.805*</b>

d indicates the first differencing of the variables. The symbols \* indicate that the null



hypothesis is rejected at the 1% significance level.

Considering that the observed variables are I(1) processes, a long-run equilibrium estimation has been performed. We have chosen the best VAR model with the following endogenous variables: LRTourrec, LRGDP and LReer. The optimal lag length in the VAR model is six and one, based on LR test statistic, FPE, AIC, SC, and HQ (Table 2). We estimated VAR models with both one and six lags and chose the six lag model according to AIC and SIC minimum values.

Table 2: VAR Lag Order Selection Criteria. Endogenous variables: LRGDP, LRTourrec, LReer

Lag	LogL	LR	FPE	AIC	SC	HQ
1	350.9958	NA	6.42e-08	-8.046960	-7.788326*	-7.942930*
2	361.7352	19.96268	6.17e-08	-8.087888	-7.570620	-7.879828
3	374.5269	22.87453	5.65e-08	-8.177104	-7.401203	-7.865014
4	376.7115	3.752359	6.66e-08	-8.016741	-6.982206	-7.600622
5	397.7719	34.68774	5.04e-08	-8.300515	-7.007347	-7.780367
6	408.7267	17.26984*	4.86e-08*	-8.346510*	-6.794708	-7.722331
7	415.9003	10.80265	5.13e-08	-8.303536	-6.493101	-7.575328
8	419.4471	5.090782	5.92e-08	-8.175227	-6.106158	-7.342989

\* indicates lag order selected by the criterion

As a result of the Johansen cointegration test used in the VAR model, the Trace and Maximum eigen value tests show that there is no cointegration in the model: both the Trace statistic and the

Maximum eigen value statistic are smaller than their respective critical values at 5%, indicating that we cannot reject the null hypothesis that there are zero cointegrating relations (Table 3). Therefore, **long-run equilibrium does not exist between TD and economic growth, TLGH is not established for Armenia.**

Table 3: Cointegration test results on LRTourrec, LRGDP and LReer

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.*	Max-Eigen Statistic	0.05 Critical Value	Prob.*
None	0.169751	29.67818	29.79707	0.0516	15.99857	21.13162	0.2249

\*MacKinnon-Haug-Michelis (1999) p-values. The optimal number of lags is 6.

Since long-run equilibrium does not exist between the three time-series, VECM cannot be used, a short-run dynamic relationship can be estimated through the VAR estimation. VAR model needs to include first differenced series: d(LRTourrec), d(LRGDP) and d(LReer). The optimal lag of the VAR model built with stationary variables is eight. The model satisfies the condition of stability (Figure 1).

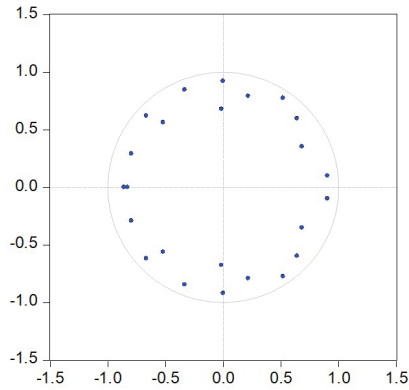


Figure 1. VAR model stability

Breusch–Godfrey Serial Correlation LM test showed that the residuals of the VAR model are independent and Breusch–Pagan–Godfrey Heteroskedasticity test showed that the residuals are homoscedastic.

To determine the direction of causal relationship TD-economic growth, we used the Granger causality test in the selected VAR model (Table 4). The null hypothesis that LRTourrec does not Granger cause LRGDP is rejected based on the chi-squared test of 22.449, with  $df=8$  and a  $p$ -value=0.0041. The second hypothesis (LRGDP does not Granger cause LRTourrec) is also rejected based on the chi-squared test of 19.476, with  $df=8$  and a  $p$ -value=0.0125. **The results provide empirical evidence of bilateral causality.**

Table 4: Granger causality tests for tourism and GDP

Dependent variable: <b>d(LRGDP)</b>				Dependent variable: <b>d(LRTourrec)</b>			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
d(LRTourrec)	22.44859	8	0.0041	D(LRGDP)	19.47647	8	0.0125
d(LReer)	8.086681	8	0.4250	D(LReer)	8.646066	8	0.3730
All	32.28146	16	0.0092	All	25.46516	16	0.0620

The VAR model, built with LRTourrec, LRGDP and LReer endogenous variables, allows us to estimate the interactions of these variables over 8 quarters. The results of the Wald test, based on F-statistic test of 2.806, with  $df = (8.59)$  and a  $p$ -value = 0.0105 and Chi-square test of 22.449, with  $df = 8$  and a  $p$ -value = 0.0041 evidence that the joint impact of tourism development on economic growth is statistically significant. According to the Wald test, based on F-statistic test of 2.435, with  $df = (8.59)$  and a  $p$ -value = 0.024 and Chi-square test of 19.476, with  $df = 8$  and a  $p$ -value = 0.0125 the joint impact of economic growth on tourism development is statistically significant (Table 5).

Table 5: Wald Test

<b>Dependent variable: d(LRGDP)</b>			
Test Statistic	Value	df	Probability
F-statistic	2.806073	(8, 59)	0.0105
Chi-square	22.44859	8	0.0041
Independent variable: d(LRtourrec). Null Hypothesis: $\beta_1 = \dots = \beta_j = \dots = \beta_8 = 0$			
<b>Dependent variable: d(LRtourrec)</b>			
Test Statistic	Value	df	Probability
F-statistic	2.434559	(8, 59)	0.0240
Chi-square	19.47647	8	0.0125
Independent variable: d(LRGDP). Null Hypothesis: $\delta_1 = \dots = \delta_i = \dots = \delta_8 = 0$			

$\beta_j$  is the coefficient of the j-th lag of the independent variable d(LRtourrec) in the equation d(LRGDP).  $\delta_i$  is the coefficient of the i-th lag of the independent variable d(LRGDP) in the equation d(LRtourrec).

Table 6 shows the part of the results of the VAR model LRGDP equation that represents the impact of tourism on economic growth.

Table 6: VAR model, Dependent variable: **d(LRGDP)**

	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
$d(\ln(Rtourrec))_{t-1}$	0.055004	0.050094	1.098024	0.2767
$d(\ln(Rtourrec))_{t-2}$	0.077792	0.051202	1.519321	0.1340
$d(\ln(Rtourrec))_{t-3}$	0.043679	0.050568	0.863776	0.3912
$d(\ln(Rtourrec))_{t-4}$	0.180552	0.049576	3.641947	0.0006
$d(\ln(Rtourrec))_{t-5}$	0.160442	0.050764	3.160531	0.0025
$d(\ln(Rtourrec))_{t-6}$	0.111033	0.053505	2.075198	0.0423
$d(\ln(Rtourrec))_{t-7}$	0.110099	0.055231	1.993449	0.0508
$d(\ln(Rtourrec))_{t-8}$	0.108051	0.048564	2.224932	0.0299
Adjusted R-squared	0.307890			
F-statistic	2.538463	Prob(F-statistic) = 0.001922		
Durbin-Watson stat	2.136771			
Breusch-Pagan-Godfrey test	Obs*R-squared = 38.18018	Prob.Chi-Square(27)=0.0751		
Breusch-Godfrey LM test	Obs*R-squared = 2.429876	Prob.Chi-Square(2)=0.2967		

Based on the estimation of the VAR model, we obtained the following results: (1) A 1% increase in tourism receipts after 4 quarters leads to an acceleration of economic growth by 0.18% (p-value = 0.001), after 5 quarters by 0.16% (p-value = 0.003), after 6 quarters by 0.11% (p-value = 0.042) and after 8 quarters by 0.11% (p-value = 0.03), *ceteris paribus*. (2) Accelerating economic growth by 1% after 6 quarters leads to a 0.68% increase in tourism revenue at the 5% significance level, *ceteris paribus* (p-value = 0.032).

### Conclusion

The Tourism-Led Growth Hypothesis, widely discussed in the literature, according to which international tourism is a strategic factor of economic growth in the long run, has been tested for Armenia. An integration-causal analysis was performed. In order to assess the long-run impact of international tourism on Armenia's economic growth, the Johansen Cointegration Test was used in the VAR model with the following endogenous variables: real effective exchange rate, real GDP and real tourism receipts. According to the cointegration analysis, there is no long-run relationship between tourism development and economic growth in Armenia. In other words, **the TLGH is not confirmed for Armenia**.

According to Granger causality test, there is a bilateral causality between economic growth and tourism development for Armenia. Causality test supports the hypothesis of tourism-driven economic growth in the short run. At the same time, the testing results imply that the rapid economic expansion in Armenia tends to attract more international travel in the short run.

Using the VAR model, TD-economic growth interactions in the short run were estimated. The results of the VAR model evidence that a 1% increase in tourism receipts accelerates economic growth from 0.11% to 0.18% over the next 4 to 8 quarters, *ceteris paribus*. In turn, economic growth affects the development of tourism. Accelerating economic growth by 1% leads to an increase in tourism receipts after six quarters, *ceteris paribus*.

Despite the short-run nature of the TD-economic growth interaction, this results suggest that economic development, including the modernization of infrastructure services, will make Armenia an attractive tourist destination. At the same time, an active tourist-attracting policy should be implemented as an effective means of promoting Armenia's economic development. Systematic allocation of resources to stimulate and promote tourism is necessary to sustain tourism as an engine of growth and development (Croes & Vanegas Sr. 2008). Analyzing the link between TD and economic growth should be contemplated in any country wishing to focus on tourism as part of its economic development strategy (Kim et al. 2006).

Analyzing the relationship between tourism and economic growth in the long run and in the short run can be useful both for government agencies in their strategic plan for the country's long-term development, in managing tourism operations, and in developing the right strategy for tourism businesses.

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ՓՈՐՁԱՌԱՎԱՆ ՎԵՐԼՈՒԾՈՒԹՅՈՒՆ ՀԱՅԱՍՏԱՆԻ ՀԱՄԱՐ**

Վերջին տարիներին տնտեսագիտական գրականության մեջ լայնորեն քննարկվում է այն հարցը, թե արդյոք զբոսաշրջությունը նպաստում է երկարաժամկետ տնտեսական աճին, սակայն էմպիրիկ (փորձառական) հետազոտությունների արդյունքները մնում են հակասական: Առաջ է քաշվել Ջբոսաշրջության գլխավորությամբ աճի վարկածը (ԶԳԱՎ), որի համաձայն միջազգային զբոսաշրջությունը երկարաժամկետ հեռանկարում տնտեսական աճի ռազմավարական գործոն է հանդիսանում: COVID-19 համաձարակը վերահաստատեց երկրների կողմից այս վարկածը էմպիրիկ կերպով փորձարկելու անհրաժեշտությունը, քանի որ շատ երկրներ ձանաչում են զբոսաշրջության կարևոր դերը տնտեսության վերականգնման գործում: Եթե ԶԳԱՎ-ն վավեր է, ապա ավելի շատ ռեսուրսներ պետք է հատկացվեն զբոսաշրջության ոլորտին, քան նախկինում:

Հետազոտությամբ ուսումնասիրվել են զբոսաշրջության զարգացման և տնտեսական աճի միջև եղած պատճառահետևանքային կապերը Հայաստանի տնտեսության համար՝ օգտագործելով միավոր արմատ թեստավորման, վեկտորական ավտոռեգրեսիայի (VAR) մոդելավորման, կոինտեգրացիոն վերլուծության և ըստ Գրեյնջերի պատճառահետևանքային կապի թեստավորման էկոնոմետրիկ մեթոդաբանությունը: Կոինտեգրացիոն թեստի արդյունքները ցույց են տալիս, որ իրական ՀՆԱ-ի և զբոսաշրջությունից ստացվող իրական եկամուտների միջև երկարաժամկետ հավասարակշռված կապերը բացակայում են: Մեր ստացած արդյունքները նաև փորձառական կերպով ցույց են տալիս, որ Հայաստանի դեպքում Ջբոսաշրջության գլխավորությամբ աճի վարկածը չի հաստատվում: Գրեյնջերի պատճառահետևանքային թեստի արդյունքները ենթադրում են երկկողմանի պատճառահետևանքային կապ զբոսաշրջության զարգացման և տնտեսական աճի միջև: Զբոսաշրջության զարգացում-տնտեսական աճ փոխազդեցությունները գնահատվել են VAR մոդելի միջոցով:

**Հիմնաբառեր.** զրոսաշրջության զարգացում, տնտեսական աճ, փորձառական վերլուծություն, Ջրոսաշրջության գլխավորությանը աճի վարկած, միավոր արժանտ թեստ, կոինտեգրացիա, պատճառականություն ըստ Գրեյնջերի:

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## **ТУРИЗМ КАК ФАКТОР ЭКОНОМИЧЕСКОГО РОСТА: ЭМПИРИЧЕСКИЙ АНАЛИЗ ДЛЯ АРМЕНИИ**

В последние годы вопрос о том, способствует ли туризм долгосрочному экономическому росту, широко обсуждался в экономической литературе, но результаты эмпирических исследований остаются противоречивыми. Была представлена Гипотеза роста, ориентированная на туризм (ГРОТ), согласно которой международный туризм является стратегическим фактором экономического роста в долгосрочной перспективе. Пандемия COVID-19 подтвердила необходимость эмпирически проверить эту гипотезу, поскольку большинство стран признают решающую роль туризма в восстановлении экономики. Если ГРОТ действителен, то на индустрию туризма следует выделять больше ресурсов, чем это было раньше.

В этом исследовании изучаются причинно-следственные связи между развитием туризма (РТ) и экономическим ростом для экономики Армении с использованием эконометрической методологии тестирования единичного корня, моделирования векторной авторегрессии (VAR), коинтеграционного анализа и тестирования причинно-следственной связи по Грейнджеру. Результаты теста на коинтеграцию указывают на отсутствие долгосрочной равновесной взаимосвязи между реальным ВВП и реальными поступлениями от туризма. Наши результаты также эмпирически продемонстрируют, что Гипотеза роста, ориентированная на туризм, не выполняется в Армении. Результаты теста причинно-следственной связи Грейнджера предполагают двустороннюю причинно-следственную связь между развитием туризма и экономическим ростом. Взаимодействие РТ и экономического роста оценивалось с использованием модели VAR.

**Ключевые слова:** развитие туризма, экономический рост, эмпирический анализ, Гипотеза роста, ориентированная на туризм, тест на единичный корень, коинтеграция, причинность Грейнджера.

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