ECONOMICS & Sociology

Tovmasyan, G. (2023). Factors that influence domestic tourism demand: Evidence from Armenia. *Economics and Sociology*, *16*(2), 75-88. doi:10.14254/2071-789X.2023/16-2/5

FACTORS THAT INFLUENCE DOMESTIC TOURISM DEMAND: EVIDENCE FROM ARMENIA

Gayane Tovmasyan
AMBERD Research Center,
Armenian State University of Economics,
Public Administration Academy,
Yerevan, Republic of Armenia
E-mail:
tovmasyangayane@yahoo.com
ORCID 0000-0002-4131-6322

Received: May, 2022
1st Revision: March, 2023
Accepted: June, 2023

DOI: 10.14254/2071-789X.2023/16-2/5

ABSTRACT. Armenia has great opportunities and resources for tourism development. In 2021, the number of domestic tourists in Armenia was 1595826, an increase of 52.6% compared to 2020. In 2022, the number of domestic tourists was higher than in previous years - 1929940. The article evaluates the factors which influence domestic tourism demand with the use of ordinary and weighted least squares regression models. The main variables discussed in the models are: real GDP growth rate, consumer price index, average cost of tour packages from Armenia to other countries that can be considered as an alternative to domestic tourism, and dummy variables. The time series are based on quarterly data from 2005-2021. According to the analysis results, 1% increase in GDP will lead to a 0.22% increase in the number of domestic tourists, 1% increase in prices will lead to a decrease in the number of domestic tourists by about 0.12%, and 1% increase in foreign tour package prices will increase the number of domestic tourists by about 0.14%. The article also presents some suggestions for domestic tourism development in Armenia. The results may be useful for similar studies, as well as for state and private sectors conducting forecasts, planning, etc.

JEL Classification: Z32, L83, C53

Keywords: domestic tourism, OLS and WLS, Breusch-Pagan heteroskedasticity test, Breusch-Godfrey LM test, Cochrane-Orcutt regression, Republic of Armenia

Introduction

Tourism plays a significant role in the economic development of countries. During the Covid-19 pandemic the sphere suffered a lot due to international travel restrictions. Many tourists started to travel within their own countries as an alternative to international tourism.

Tourism is one of the major fields of economy in the Republic of Armenia (RA). Armenia has great opportunities and considerable tourism resources, which can be the basis for the development of religious, historical and cultural, health, eco, agro, gastronomic and wine, sports and adventure types of tourism in the country.

In recent years tourism has been growing in Armenia (Tovmasyan, 2020, 2022a). The number of incoming and domestic tourists has risen. In 2019, the number of domestic tourists in Armenia was 1544600, having increased by 41.4% compared to the previous year. The purpose of travel for the majority of domestic tourists was leisure and entertainment (72%). In

2020, due to the Covid-19 pandemic, the number of domestic tourists decreased by about 33% compared to the previous year, amounting to 1045756 people.

Table 1. Number of Domestic tourists in the RA, 2017-2022

Number / year	2017	2018	2019	2020	2021	2022
Domestic tourists*, from which by purpose	1086707	1092322	1544600	1045756	1595826	1929940
business	252787	207761	280542	150649	247843	383873
leisure and entertainment	742188	781668	1112305	765100	1229224	1412388
Health treatment	43558	58339	52006	53500	67325	67298
other	48174	44554	99747	76507	51434	66381

* The data reflect the tourists who stayed at the hotel facilities (hotels, hotel-type resorts, resorts, holiday homes, etc.).
Source: Socio-economic situation of the RA for 2018-2023

In 2021, the number of domestic tourists increased by 52.6% compared to 2020, and by 3.3% compared to 2019. This increase was due to the closed borders and international travel restrictions imposed in many countries because of Covid-19, and many tourists, who could not go abroad, deciding to take a holiday domestically.

In 2022, the Covid-19 was not over yet. Although some countries eased entry requirements, in other countries the virus had a resurgence. During 2022, the number of domestic tourists increased significantly and was higher than in previous years, even before Covid-19. This means that people continued to have vacations inside the country during 2022.

Currently, as the Covid-19 pandemic is not over yet, some countries have restrictions for Chinese tourists as recently there was a boost of pandemic in China. Therefore, we can assume that in future there may be international travel restrictions again. Under such conditions every country tries to develop domestic tourism. Hence, it is essencial to analyze factors that influence domestic tourism development in Armenia and to explore solutions for it.

The aim of this article is to detect domestic tourism advancement issues in Armenia by revealing and evaluating the factors that influence domestic tourism demand. For that purpose, literature sources were analyzed and forecasts for domestic tourism in Armenia were performed based on a number of methods.

1. Literature review

In this section various literature sources are analyzed that present domestic tourism development methods in different countries.

There are many methods and models developed to forecast the demand for the tourism and transportation industries (Ghalehkhondabi et al, 2019).

Some researchers model the tourism demand as disaggregated components according to variables such as country of residence, purpose of the trip, type of transport and accommodation (De Oliveira & Eduardo, 2009).

Multiple linear regression was used by Varagouli et al. (2005), Anderson et al. (2006) to forecast the domestic travel demand.

Blainey and Mulley (2013) used a geographically weighted regression to forecast the rail demand in New South Wales, Australia. They tested the following variables in the models: population and employment, income and age profile, household size, car ownership levels, etc.

Based on the survey papers by Crouch (1994) and Lim (1997), the following factors can influence international tourism demand: income, relative prices between prices of origin and

destination, exchange rates, relative prices between a destination and its competing destinations, cost of transportation, marketing expenditures, consumers′ preferences, the effects of special events as well as other factors such as the effects of word-of-mouth.

In the context of domestic tourism demand, a study on how income and tourism prices affect the demand is crucial. Maurer et al. (2006) analyzed the causal relationships amongst economic variables and Australian domestic tourism variables and found that the main drivers of domestic tourism demand are discretionary income, consumer confidence indices and prices.

Regarding domestic tourism prices, the costs of living at the region concerned, such as the prices of tourist accommodation, recreation and restaurants, are the most crucial factors for domestic tourism demand. Domestic tourists' income, the prices of tourism goods and services are the important economic determinants that influence domestic travel. Another characteristic feature of domestic tourists is that they make choices between domestic destinations by comparing the costs between travelling to intrastate and interstate destinations (Yap, 2010).

Another study proposed a demand model that examined the relationship between the annual expenditure of urban domestic travelers and per capita GDP (Cai et al, 2002).

A study in Greece reveals the following factors that influence domestic travel: the population of the country, disposable national income, the average total cost for a 10-day stay in Greece including travel expenses, the average cost for a 10-day stay in other competitive countries, the exchange rate of the currency, the gross investment in fixed assets in Greece, advertising expenditures in the country of origin, a dummy variable that measures political stability in Greece (Dritsakis & Athanasiadis, 2000).

A different study estimates the income and tourism price elasticities of demand for Australian domestic tourism using a panel data approach. According to the model, the income elasticity for domestic tourism trips in Australia is negative, implying that Australian households will not choose to travel domestically when there is an increase in household income. Second, the national income variables are positively correlated with domestic business tourism demand indicating that the demand is strongly responsive to changes in Australia's economic conditions. Third, an increase in the current prices of domestic travel can cause the demand for domestic trips to fall in the next one or two quarters ahead. Finally, the coefficients for lagged dependent variables are negative, indicating perhaps, that trips are made on a periodic basis (Allen & Yap, 20019).

An analysis in Galicia shows that both domestic and foreign tourism in Galicia is highly sensitive to income in the origin markets and to prices. Other findings are the dependence of domestic tourism on its own past and the sensitivity of tourism to the celebration of the Holy Year (Garín-Muñoz, 2009).

In Armenia previous studies have applied static and dynamic models for domestic tourism forecasts (Poghosyan & Tovmasyan, 2021). As for the incoming tourists' forecasts, ARIMA method was applied (Tovmasyan, 2021).

Thus, different studies mainly take variables such as the number of tourists, GDP or income level, price index, the prices of tourist packages in other countries, dummy variables for domestic tourism forecasts, etc.

2. Methodological approach

Ordinary least squares and weighted least squares methods were used in the analysis. Breusch-Pagan heteroskedasticity test, Breusch-Godfrey LM test and Cochrane-Orcutt regression were applied.

Ordinary Least Squares regression (OLS) is a common method for evaluating coefficients of linear regression equations that describe the relationship between one or more

independent quantitative variables and a dependent variable (simple or multiple linear regression). In the case of a model with *p* explanatory variables, the OLS regression model is the following:

$$Y = \beta_0 + \Sigma_{j=1..p} \beta_j Xj + \varepsilon,$$

where Y is the dependent variable, β_0 is the intercept of the model, X_j corresponds to the j^{th} explanatory variable of the model (j= 1 to p), and ε is the random error with expectation 0 and variance σ^2 (Ordinary Least Squares Regression).

The weighted least squares regression (WLS) is used when heteroskedasticity (non-constant error variance) is present in an analysis – with the correct weight, inefficient estimates and biased standard errors can be limited.

The regression equation $Y = c+b_1x_1+b_2x_2+\ldots+b_kx_k+e$ has the same form as the OLS regression equation (Y is the dependent variable, b's are the regression coefficients, c is the constant or intercept, and e is the error term), but instead of minimizing the residual sum of squares $RSS=\sum_{i=1}^{n} e_i^2$, where e_i are residuals, the weighted sum of squares $WSS=\sum_{i=1}^{n} W_i e_i^2$ is minimized (W_i is the weight given to the i_{th} observation). If W is the diagonal matrix of weights, X is the matrix of predictor variables as columns (an extra column of ones is added if the intercept is included in the model), b is the column vector of coefficients corresponding to the columns of X, the WLS estimator of b is determined as $b=\hat{\beta}_W = (X^T WX)^{-1} X^T WY$ (Weighted Least Squares Regression).

There are several tests for evaluating the heteroscedasticity with the following null and alternative hypotheses:

- H_0: The residuals are homoscedastic
- H_a: The residuals are heteroscedastic

One of the tests was developed by Breusch and Pagan in 1979. If e is the vector of the errors of the model, the null hypothesis H_0 of said error terms being of constant variance can write: $H_0 : E(e^2) = \sigma^2$.

To verify that the quadratic errors are independent of the explanatory variables, which can translate into many functional forms, the simplest is to regress the squared errors by the explanatory variables. If the data are homoskedastic, the coefficient of determination R^2 should then not be equal to 0. If H_0 is not rejected we can conclude that heteroscedasticity, if it exists, does not take the functional form used. Practice shows that heteroscedasticity is not a problem if H_0 is not accepted. If H_0 is rejected, it is likely that there is heteroscedasticity and that it takes the functional form described above.

The statistic used for the test proposed by Koenker in 1981 is: $LM = nR^2$,

where LM stands for Lagrange multiplier. This statistic has the advantage of asymptotically following a Chi-square distribution with p degrees of freedom, where p is the number of explanatory variables.

If the null hypothesis is rejected, it is necessary to transform the data before doing the regression, or using modeling methods to take into account the variability of the variance (Heteroscedasticity Tests).

Breusch-Godfrey (BG) test can detect autocorrelation up to any predesignated order p. It also supports a broader class of regressors (e.g. models of the form $y_i = ax_i + by_{i-1} + c$) (Breusch-Godfrey Test).

Cochrane-Orcutt regression is an iterative version of the FGLS method for addressing autocorrelation (Cochrane-Orcutt Regression).The following indicators were taken for the static regression model of the development of domestic tourism in Armenia:

- the number of domestic tourists (people),
- the real GDP growth rate (in %),
- the consumer price index (CPI, in %),

- the average cost of the tour packages from Armenia to other countries (in Armenian Drams) which can be considered as an alternative for domestic tourism for the citizens of the Republic of Armenia,
- As false or dummy variables were taken the global financial and economic crisis of 2008, the Covid-19 pandemic, and the 44-day war in Nagorno-Karabakh (in autumn of 2020).

The average cost of the tour packages from Armenia to other countries was revealed by conducting surveys among various travel agencies. Georgia, Egypt, UAE (Dubai), Greece, Spain and Italy were the main destinations. A proxy of the values of tour pachages has been performed.

Since 2012, Armenia offers a social package for workers, which includes also the opportunity to spend holidays in Armenia. However, for the model it has not been considered separately as a false variable, as it is already included in GDP.

The database for the regression model was created based on quarterly data from 2005 / Q 1 till 2021 / Q 3 (67 observations for each variable). The time series used in the model have been subjected to preliminary statistical processing, in particular, the natural logarithm of their absolute values has been calculated; then, the series that have seasonality were subjected to seasonal leveling (seasonal alignment was performed by $S_{n\times m}$ seasonal filter (X11) method and the first differences of the aligned series were calculated. Next, all time series were brought to the same scale, that is, the values of each series were divided by the standard deviations of the corresponding series. As a result, the estimated coefficients are easier to interpret, and standardized time series with quarterly percentage changes were obtained.

As the consumer price index also includes the prices of services, including the cost of hotels, therefore, in order to avoid duplication, the cost of rest in RA hotels was not included in the model.

3. Results

At first, the model was evaluated using the ordinary least squares method, later the weighted least squares was applied. The choice of this method is explained by the fact that the residuals of the model estimated by the ordinary least squares method can be characterized by heteroskedastic-autocorrelated behavior.

The result obtained by the ordinary least squares method is presented in Table 2.

In Table 2 tourist is the change in the number of domestic tourists, which is a dependent variable in the model (in %), gdp_gr is the real GDP growth rate (in %), infl is inflation or CPI (in %), int_price is the average cost of foreign travel packages, dummy1 is the global financial and economic crisis of 2008, dummy2 is the Covid-19 pandemic, dummy3 is the war in Nagorno-Karabakh. The mentioned variables in the model are explanatory variables.

The problem with regression estimated by the ordinary least squares is that the errors exhibit heteroskedastic behavior because of Covid-19 and the Nagorno-Karabakh war. The errors of this model are shown in the diagram below.

Table 2. The model of factors influencing the domestic tourism of the Republic of Armenia attained by the least squares method

Source	SS	df	MS	Number of obs = 66		
Model	29.7183142	6	4.95305236	F (6, 59) = 8.28		
Residual	35.2816897	59	.597994741	Prob>F = 0.0000		
				R-squared = 0.4572		
Total	65.0000039	65	1.00000006	Adj R-squared = 0.4020		
				Root MSE = .7733		
tourist	Coef.	Std. Err.	t	P>|t|	[95 % Conf.	Interval]
GDP_gr	.3350268	.1210009	2.77	0.008	.0929045	.577149
Infl	-.156291	.105328	-1.48	0.143	-.3670518	.0544699
Int_price	.2152311	.1058771	2.03	0.047	.0033715	.4270907
Dummy1	1.531199	.8982575	1.70	0.094	-.2662105	3.328608
Dummy2	-3.80489	.8627882	-4.41	0.000	-5.531325	-2.078455
Dummy3	-.0448231	.8410807	-0.05	0.958	-1.727822	1.638175
_cons	.0930259	.1177658	0.79	0.433	-.1426229	.3286747

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

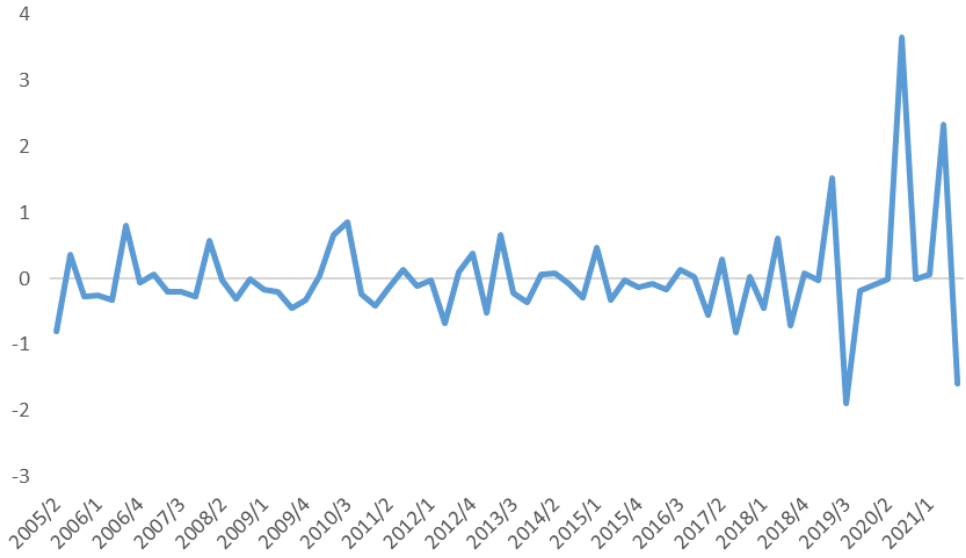

Figure 1. Error dynamics of the model estimated by the ordinary least squares
Source: The figure was created as a result of the analysis performed by the author with the help of MS Excel.

Figure 1 shows that the fluctuations during the years 2020-2021 are significantly different from the fluctuations of the errors in the previous years. The hypothesis of heteroskedasticity can also be tested using a statistical test, such as the Breusch-Pagan test, the results of which are presented below.

Table 3. Breusch-Pagan heteroskedasticity test result

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
H_0: Constant variance
Variables: fitted values of tourist
chi2(1) = 6.63
Prob > chi2 = 0.0100

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

The null hypothesis in this test is that the error dispersions are equal and the alternative hypothesis is that they are not equal. The criterion for this test has chi2 distribution. In this case the degree of freedom is 1. The calculated value of the test is equal to 6.63 which exceeds the 95% critical value, so the alternative hypothesis is accepted, which is, the dispersions are not equal, therefore, the errors have heteroskedasticity.

The second problem is that the model errors estimated in the least squares are autocorrelated. This is evidenced by the Breusch-Godfrey LM test. The results of this test for different lag values are presented in Table 4.

Table 4. Breusch-Godfrey LM test results

Breusch-Godfrey LM test for autocorrelation			
lags (p)	chi2	df	Prob > chi2
1	6.455	1	0.0111
2	6.710	2	0.0349
3	9.429	3	0.0241
4	13.330	4	0.0098
5	14.750	5	0.0115
6	15.216	6	0.0186
7	17.254	7	0.0158
8	17.343	8	0.0267
9	18.312	9	0.0317

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

Table 4 shows the calculated values of the chi2 criterion, their degrees of freedom and the corresponding probabilities. The null hypothesis is that there is no serial auto-correlation in the model residuals (or errors). Since the calculated probability values for all the lags presented in the table are less than the critical value of 0.05, the conclusion is that the model residuals are characterized by serial autocorrelation.

Thus, in the case of heteroskedastic-autocorrelated behavior of the model residuals, the estimates obtained by the ordinary least squares method are skewed. The following steps have been taken to address this issue and to attain consistent assessments. First, the Cochrane-Orcutt methodology was used, which excludes autocorrelation of the model residuals, and next, based on the Cochrane-Orcutt regression residuals, the weighted least squares method was used, which excludes the heteroskedasticity of the model residuals. The results of the Cochrane-Orcutt regression are presented in Table 5.

Table 5. Cochrane-Orcutt regression results

Cochrane-Orcutt AR (1) regression – iterated estimates						
Source	SS	df	MS	Number of obs = 65		
Model	19.4145099	6	3.23575165	F (6, 58) = 6.71		
Residual	27.9875188	55	.482543428	Prob>F = 0.0000		
				R-squared = 0.4096		
Total	47.4020287	64	.740656699	Adj R-squared = 0.3485		
				Root MSE = .69465		
tourist	Coef.	Std. Err.	T	P> | t |	[95 % Conf. Interval]	
GDP_gr	.2327709	.0951177	2.45	0.017	.0423721	.4231698
Infl	-.0846125	.0841889	-1.01	0.319	-.2531348	.0839098
Int_price	.1006273	.0753517	1.34	0.187	-.0502055	.2514601
Dummy1	.8227325	.7325424	1.12	0.266	-.6436105	2.289075
Dummy2	-2.368545	.6537071	-3.62	0.001	-3.677081	-1.060008
Dummy3	1.831465	.6347553	2.89	0.005	.5608643	3.102066
_cons	.0478135	.0806436	0.59	0.556	-.1136123	.2092393

rho	-.5898949
Durbin – Watson statistic (original)	2.367697
Durbin – Watson statistic (transformes)	2.492468

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

In the second step taking the Cochrane-Orcutt regression residuals (which are free of autocorrelation), applying the weighted least squares method, neutralizing the heteroskedasticity of the residues, steady-state model estimates were attained. The results are presented in Table 6.

Table 6. Model of factors influencing domestic tourism by weighing least squares

Source	SS	df	MS	Number of obs = 66		
Model	3.44557764	6	.57426294	F (6, 59) = 22.01		
Residual	1.53923138	59	.026088667	Prob>F = 0.0000		
Total	4.98480902	65	.07668937	R-squared = 0.6912 Adj R-squared = 0.6598 Root MSE = .16152		
tourist	Coef.	Std. Err.	t	P> | t |	[95 % Conf.	Interval]
GDP_gr	.2175678	.0333323	6.53	0.000	.1508701	.2842656
Infl	-.1234192	.0391888	-3.15	0.003	-.2018358	-.0450026
Int_price	.1358336	.027356	4.97	0.000	.0810944	.1905728
Dummy1	1.028569	.2211544	4.65	0.000	.5860397	1.471097
Dummy2	-4.136311	.5883373	-7.03	0.000	-5.313571	-2.959051
Dummy3	-.114229	.4669542	-0.24	0.808	-1.048602	.8201442
_cons	.0870719	.0223673	3.89	0.000	0.423151	.1318287

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

The results of the regression analysis show that R2 was 0.6912, i.e. the change in the number of domestic tourists is explained by about 69% of the model variables. In other words, changes in real GDP, inflation, and foreign tour packages' prices play a key role in the growth of domestic tourism in the country. As shown in the table, the effects of almost all variables of the model are statistically significantly different from zero (except for the false variable of the Nagorno-Karabakh war All coefficients have an economic explanation. Thus, a *1% increase in GDP, according to the model, will lead to a 0.22% increase in the number of domestic tourists, a 1% increase in prices will lead to a decrease in the number of domestic tourists by about 0.12%, and a 1% increase in foreign tour package prices will increase the number of domestic tourists by about 0.14%.* As shown in the table 6, the impact of the global financial crisis and the pandemic on domestic tourism has been significant. This is logical as there were made restrictions on movements, especially during the pandemic, and the impact of the Nagorno-Karabakh war. on domestic tourism is insignificant, which can be explained by its short period.

The model was also evaluated by replacing the CPI with the prices of hotels in Armenia. The model, like the previous model, was evaluated first by the ordinary least and later by the weighted least squares methods, because the model's error behavior contains heteroskedasticity, autocorrelation. The results obtained by the method of the ordinary least squares are presented in Table 7.

Table 7. The model of factors influencing the domestic tourism of the Republic of Armenia by the ordinary least squares method, taking into account the prices of domestic hotels

Source	SS	df	MS	Number of obs = 66		
Model	31.8611172	6	5.3101862	F (6, 59) = 9.45		
Residual	33.1388867	59	.561676045	Prob>F = 0.0000		
Total	65.0000039	65	1.00000006	R-squared = 0.4902 Adj R-squared = 0.4383 Root MSE = .74945		
Tourist	Coef.	Std. Err.	t	P> | t |	[95 % Conf.	Interval]
GDP_gr	.2253001	.1152202	1.96	0.055	-.005255	.4558552
dhotel_home	-.2448899	.0986753	-2.48	0.016	-.4423388	-.0474409
Int_price	.1512197	.1006135	1.50	0.138	-.0501074	.3525468
Dummy1	1.231601	.870273	1.42	0.162	-.5098113	2.973013
Dummy2	-3.835936	.828362	-4.63	0.000	-5.493485	-2.178387
Dummy3	.4286004	.8091945	0.53	0.598	-1.190594	2.047795
_cons	.0068166	.1010264	0.07	0.946	-.1953368	.20897

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

In Table 7 dhotel_home is the average cost of a hotel stay in Armenia. Therefore, the replacement of the CPI index with the hotel price in the model does not change the content.

Figure 2 shows the error dynamics of the model estimated by the ordinary least squares method.

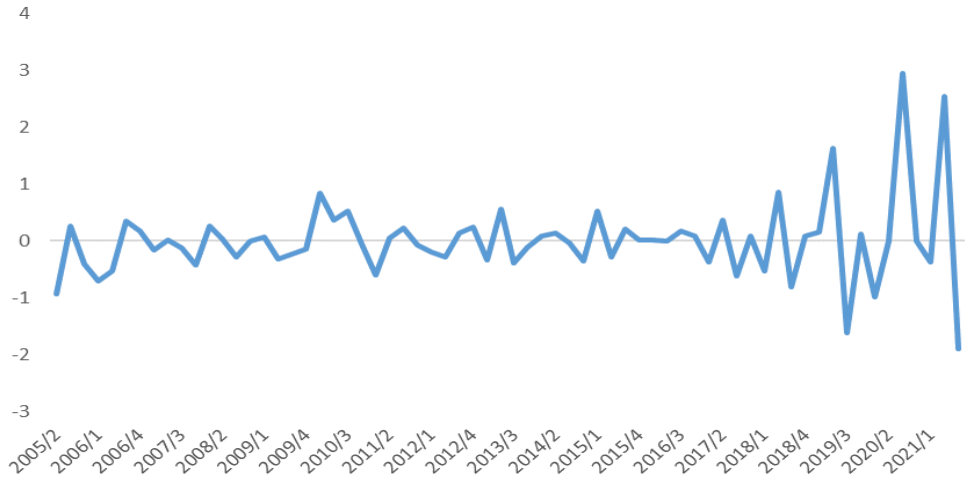

Figure 2. Error dynamics of the model estimated by the ordinary least squares
Source: The figure was created as a result of the analysis performed by the author with the help of MS Excel.

The heteroscedasticity hypothesis was tested again using the Breusch-Pagan statistical test, the results of which are presented in Table 8.

Table 8. Breusch-Pagan heteroskedasticity test result

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
H_0: Constant variance
Variables: fitted values of tourist
chi2(1) = 8.36
Prob > chi2 = 0.0038

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

The calculated value of the test is equal to 8.36, which exceeds the 95% critical value, therefore the dispersions are not equal and the errors have heteroskedasticity.

Table 9 shows the autocorrelation rates of the model residuals estimated by the least squares method. Looking at table 9 we can conclude that the zero hypothesis is denied with 95% reliability.

Table 9. Breusch-Godfrey LM test results

Breusch-Godfrey LM test for autocorrelation			
lags (p)	chi2	df	Prob > chi2
1	11.502	1	0.0007
2	12.692	2	0.0018
3	13.993	3	0.0029
4	15.588	4	0.0036
5	15.700	5	0.0078
6	16.799	6	0.0101
7	19.062	7	0.0080
8	19.267	8	0.0135
9	20.143	9	0.0171

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

As in the previous case, the Cochrane-Orcutt methodology was performed here, the results of which are presented in Table 10.

Table 10. Cochrane-Orcutt regression results

Cochrane-Orcutt AR (1) regression – iterated estimates						
Source	SS	Df	MS	Number of obs = 65		
Model	20.859574	6	3.47659567	F (6, 58) = 7.68		
Residual	26.2557592	58	.452685503	Prob>F = 0.0000		
Total	47.1153332	64	.736177081	R-squared = 0.4427 Adj R-squared = 0.3851 Root MSE = .67282		
tourist	Coef.	Std. Err.	t	P> | t |	[95 % Conf. Interval]	
Gdp_gr	.1449456	.0995237	1.46	0.151	-.0542727	.3441639
dhotel_home	-.2144152	.0925897	-2.32	0.024	-.3997535	-.0290769
Int_price	.0777562	.0752692	1.03	0.306	-.0729114	.2284238
Dummy1	.6729191	.7341509	0.92	0.363	-.7966436	2.142482
Dummy2	-3.10949	.7029184	-4.42	0.00	-4.516534	-1.702446
Dummy3	1.583441	.6335446	2.50	0.015	.3152638	2.851619
_cons	.0239986	.0652904	0.37	0.715	-.1066943	.1546914
rho	-.5226814					
Durbin – Watson statistic (original) 2.497035						
Durbin – Watson statistic (transformes) 2.354505						

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

Then taking the residuals of the Cochrane-Orcutt regression the weighted least squares method was used again. The results are presented in Table 11.

Table 11. The model of factors influencing the domestic tourism of the Republic of Armenia by weighed least squares method, taking into account the prices of domestic hotels

Source	SS	Df	MS	Number of obs = 66		
Model	2.73583178	6	.455971963	F (6, 59) = 14.30		
Residual	1.88150247	59	.031889872	Prob>F = 0.0000		
Total	4.61733425	65	.071035911	R-squared = 0.5925 Adj R-squared = 0.5511 Root MSE = .17858		
tourist	Coef.	Std. Err.	t	P> | t |	[95 % Conf.	Interval]
GDP_gr	.135246	.0329125	4.11	0.000	.0693884	.2011037
dhotel_home	-.1375869	.0432497	-3.19	0.002	-.2243992	-.0513145
Int_price	.0593989	.028398	2.09	0.041	.0025747	.1162232
Dummy1	.7141379	.2636867	2.71	0.009	.1865021	1.241774
Dummy2	-4.231513	.640227	-6.61	0.000	-5.512605	-2.950422
Dummy3	.2171221	.72636	0.30	0.766	-1.236321	1.670565
_cons	.0291041	.023193	1.25	0.214	-.017305	.0755132

Source: The table was created as a result of the analysis performed by the author with the help of STATA 14.2 software package.

The results of the regression analysis show that R2 was 0.5925, i.e. the change in the number of domestic tourists is explained by about 59% by the model variables. In this model R2 is smaller than in the previous one, which is explained by the fact that in the previous one, the CPI contains the entire consumer basket, and in this case only one component of the consumer basket was taken. As shown in table 11 almost all variables in this model are also significantly different from zero. The signs are explained economically too. Thus, a *1% increase in GDP, according to the model, will lead to a 0.13% increase in the number of domestic tourists, a 1% increase in domestic hotel prices will lead to a decrease in the number of domestic tourists by about 0.14%, and a 1% increase in foreign tour package prices will increase the number of domestic tourists by about 0.06%. In this case, the impact of the global financial crisis and pandemic on domestic tourism was significant, and the impact of the* Nagorno-Karabakh *war is insignificant.* The obtained results show that the replacement of the CPI index with hotel prices has not changed the model in terms of content.

The results are logical, in line with the results of other studies in literature review, as the increase in revenue will lead to an increase in domestic tourism, and an increase in prices will lead to a decrease in domestic tourism (Tovmasyan, 2022).

4. Discussion

The Republic of Armenia has a great potential for the development of domestic tourism. All the regions of the R A and the capital Yerevan have a huge potential for tourism, possessing historical, cultural and other resources. Hence, different routes can be organized based on those resources combining different types of tourism.

In order to promote domestic tourism it is necessary to carry out activities in different directions:digital marketing, social media marketing, development of different types of tour packages, including different types of tourism: recreational, religious, pilgrimage to saint places, eco, agro, gastronomic, sports, festival tours, etc.

Armenia is rich in assets that are very attractive for tourism and based on them different types of tourism can develop. Meanwhile, tourism organizations mainly advertise the already popular destinations that are already in great demand. Developing appropriate routes based on the resources of different regions and different communities will contribute to the socio-economic development of the regions. The creation of new routes and its promotion will

contribute to the development of domestic tourism in the coming years as well. Influencer marketing with the participation of Armenian celebrities will have a significant impact. Domestic tourism can also be promoted through business tourism by organizing various events, conferences in different regions, etc.

For the promotion of domestic tourism special vouchers with a limited amount of money can be provided to large, socially disadvantaged and of minimum wage families which they can spend on tour packages, overnight stays in hotel facilities (Mkrtchyan & Tovmasyan, 2021).

Conclusion

Under the current conditions there is no alternative to the promotion and development of domestic tourism. Taking into account the decrease in inbound tourism it may be the only lifeline in the tourism sector. Therefore, the implementation of promotion activities in the coming years will contribute to the activation of socio-economic life and tourism infrastructure in the regions, and lead to sustainable regional development.

The analysis shows that domestic tourism in an emerging sector. The main variables which mainly influence the domestic tourism demand are the real GDP growth rate, the consumer price index, the average cost of the tour packages from Armenia to other countries, which can be considered as an alternative to domestic tourism.

The analysis shows that domestic tourism will increase when income increases, and it will decrease when the prices are high. In case of foreign tour packages' high prices (including also transportation expenses) domestic tourism will increase, as people will prefer to spend their holidays in their own country.

Knowing well the main factors that influence domestic tourism demand it is easy for policy makers to make estimates and create development programs for the tourism sphere.

The research restrictions are connected with the lack of statistical data. The available data for all variables are from 2005-2021 (quarterly data), 67 observations are available for each variable. However, it was enough for conducting the analysis as logical results were obtained.

Future studies should continue the forecasts by exploring domestic tourism development in future years.

References

Allen, D., & Yap, G. (2009). Modelling Australian domestic tourism demand: a panel data approach. Joondalup, Australia: Edith Cowan University, Retrieved May 5, 2022, from https://ro.ecu.edu.au/cgi/viewcontent.cgi?article=7986&context=ecuworks

Anderson, M., Sharfi, K. & Gholston, S. (2006),. "Direct demand forecasting model for small urban communities using multiple linear regression", Transportation Research Record: *Journal of the Transportation Research Board*, *1981*(1), 114-117.

Blainey, S. & Mulley, C. (2013). "Using geographically weighted regression to forecast rail demand in the Sydney region", presented at the 36th Australasian Transport Research Forum Conference, Brisbane, pp. 2-4.

Breusch-Godfrey Test, Retrieved February 5, 2023, from https://real-statistics.com/multiple-regression/autocorrelation/breusch-godfrey-test/

Cai, L. A., Hu, B., Feng, R. (2002). Domestic tourism demand in China's urban centres: Empirical analyses and marketing implications, *Journal of Vocational Marketing*, *8*(1), 64-74, https://doi.org/10.1177/135676670200800107

Cochrane-Orcutt Regression, Retrieved February 5, 2023, from https://real-statistics.com/multiple-regression/autocorrelation/cochrane-orcutt-regression/

Crouch, G. I. (1994). "The Study of International Tourism Demand: A Review of Findings," *Journal of Travel Research*, 33, 12-23. https://doi.org/10.1177/004728759403300102

de Oliveira Santos, G. E. (2009). Research note: forecasting tourism demand by disaggregated time series–empirical evidence from Spain. *Tourism Economics*, *15*(2), 467-472. https://doi.org/10.5367/000000009788254278

Dritsakis, N., & Athanasiadis, S. (2000). An econometric model of tourist demand: The case of Greece. *Journal of hospitality & leisure marketing*, *7*(2), 39-49. https://doi.org/10.1300/J150v07n02_03

Garín-Muñoz, T. (2009). Tourism in Galicia: domestic and foreign demand. *Tourism Economics*, *15*(4), 753-769. https://doi.org/10.5367/000000009789955107

Ghalehkhondabi, I., Ardjmand, E., Young, W. A., & Weckman, G. R. (2019). A review of demand forecasting models and methodological developments within tourism and passenger transportation industry. *Journal of Tourism Futures*, *5*(1), 75-93. https://doi.org/10.1108/JTF-10-2018-0061

Heteroscedasticity Tests, XLSTAT, Retrieved February 5, 2023, from https://www.xlstat.com/en/solutions/features/heteroscedasticity-tests

Lim, C. (1997). "Review of International Tourism Demand Models" , *Annals of Tourism Research*, 24, 835-849. https://doi.org/10.1016/S0160-7383(97)00049-2

Maurer, A., Quinn, T., Galliano, K., Riley, C., Collins, D., Ipalawatte, C., Dharma, S., & Fleetwood, S. (2006). An Assessment of the Australian Domestic Tourism Market, Canberra: Tourism Research Australia.

Mkrtchyan, A., & Tovmasyan, G. (2021). Perspectives of domestic tourism development in Armenia. *Bulletin of Eurasia International University*, *1*, 59-72.

Ordinary Least Squares Regression (OLS), XLSTAT, Retrieved February 5, 2023, from https://www.xlstat.com/en/solutions/features/ordinary-least-squares-regression-ols

Poghosyan, K., & Tovmasyan, G. (2021). Modelling and forecasting domestic tourism. case study from Armenia. *SocioEconomic Challenges*, *5*(2), 96-110. https://doi.org/10.21272/sec.5(2).96-110.2021

Socio-economic situation of the RA in 2018 January, p. 97, Retrieved May 5, 2022, from https://www.armstat.am/file/article/sv_01_18a_422.pdf

Socio-economic situation of the RA in 2019 January, p. 106, Retrieved May 5, 2022, from https://www.armstat.am/file/article/sv_01_19a_422.pdf

Socio-economic situation of the RA in 2020 January, p. 115, Retrieved May 5, 2022, from https://www.armstat.am/file/article/sv_01_20a_422.pdf

Socio-economic situation of the RA in 2021 January, p. 115, Retrieved May 5, 2022, from https://www.armstat.am/file/article/sv_01_21a_422.pdf

Socio-economic situation of the RA in 2022 January, p. 114, Retrieved May 5, 2022, from https://www.armstat.am/file/article/sv_01_22a_422.pdf

Socio-economic situation of the RA in 2023 January, p. 133, Retrieved June 18, 2023, from https://www.armstat.am/file/article/sv_01_23a_422.pdf

Tovmasyan, G. (2020). The problems of tourism development in the Republic of Armenia, Meknark LLC, Yerevan, 622 p. ISBN: 978-9939-0-3445-4

Tovmasyan, G. (2021). Forecasting the Number of Incoming Tourists using ARIMA Model: Case Study from Armenia. *Marketing and Management of Innovations*, 3, 139-148. http://doi.org/10.21272/mmi.2021.3-12

Tovmasyan, G. (2022). *Tourism in Armenia. Current situation and Development opportunities*. Meknark LLC, Yerevan, 177p.

Tovmasyan, G. (2022a). Evaluating the role of tourism in the economic development of the Republic of Armenia and other member states of the Eurasian Economic Union. *Journal of Liberty and International Affairs*, 8(3), 83-98. https://doi.org/10.47305/JLIA2283083t

Varagouli, E. G., Simos, T. E., & Xeidakis, G. S. (2005). Fitting a multiple regression line to travel demand forecasting: The case of the prefecture of Xanthi, Northern Greece. *Mathematical and computer modelling*, *42*(7-8), 817-836. https://doi.org/10.1016/j.mcm.2005.09.010

Yap, G. C., (2010). An econometric analysis of Australian domestic tourism demand, 311p., Edith Cowan University, Retrieved May 5, 2022, from https://ro.ecu.edu.au/cgi/viewcontent.cgi?article=1124&context=theses&httpsredir=1&referer=

Weighted Least Squares Regression, Retrieved February 5, 2023, from https://www.analystsoft.com/en/products/statplus/content/help/analysis_regression_weighted_least_squares_wls_regression.html