

## DETERMINANTS OF TOURIST DEMAND IN SLOVAKIA AND POLAND

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### Abstract

The paper aims to determine significance of selected determinants which dictate demand for domestic and foreign travel in Slovakia and Poland.

Statistical data were analysed concerning population, wages, employment and numbers of long-term domestic and international trips in the countries studied in 2005-2014. A panel data model was also designed, estimated by means of the generalised method of least squares, verified with the White test for heteroscedasticity.

Hypotheses have been proved by application of the ordinary least squares model.

Three selected factors affecting tourist demand, i.e. population, wages, and employment, are discussed in the paper presented. Impact of these determinants on incidence of long-term domestic and international trips in Slovakia and Poland in the time frame 2005-2014 has been examined. Statistics published in AMECO database were utilized and a panel model was constructed using the general method of least squares.

The article highlights a high significance of population, wages, employment and long-term domestic and international trips both in Poland and Slovakia.

**Key words:** tourism, economic factors, demographic factors, panel model, method of least squares.

**JEL Code:** D12, R13.

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### Introduction

The contemporary development of tourism is a result of many diverse factors that determine volume and structure of tourist traffic, directions and types of travel. There are many methods of grouping variables affecting development of tourism available in specialist literature. For instance, Middleton (1996) divided key determinants of tourist demand into six groups: economic, demographic, geographical, legal-political, impact of mass media, and psycho-social factors. Dwyer et al. (2010), on the other hand, focuses on the importance of

pricing and proposes a division of economic factors into price and other factors, stressing significance of income and demographic variables among the latter category.

The tourist sector cannot be operated without economic stimuli (Maráková et al., 2016). Economic conditions allow for estimating to what extent tourist needs will be converted into real consumption of tourist services. Therefore, income (earnings) of households is so important.

This article is intended to define a level of significance of selected determinants of numbers of domestic and foreign trips in Slovakia and Poland.

Two research hypotheses were tested in empirical research:

H1: Economic factors including household earnings, part of the private income, significantly influence figures of long-term domestic and international trips.

H2: Size of population substantially affects tourist demand as it influences numbers of long-term domestic and international trips reported by inhabitants of a given country.

These hypotheses have been tested by application of the ordinary least squares model which helps to observe panel data in two dimensions, i.e. spatial (the analysis applies to Poland and Slovakia) and temporal (analysis of figures for the years 2005-2014).

## **1 Conditions of tourist demand – review of literature**

Development of tourism, like of any other sector, primarily depends on demand for its products, namely, tourist services. The notion of tourist demand was formulated by Hunziker and Krapf (1961). It is the total sum of tourist goods, commodities and services tourists are willing to buy at a specific price. Specialist literature emphasises the need to distinguish between demand for travel to destinations (tourists' arrivals and associated expenditure) and demand for particular products and services associated with tourism (e. g. accommodation, restaurant meals) (Dwyer et al. 2010). This is reflected in definitions adopted for the purposes of tourism statistics, where the concept of tourist expenditure comprises a great range of items: purchase of consumer goods and services connected with travel and staying, purchase of personal items, souvenirs and gifts, spending on consumer durables regardless of their value (Eurostat, 2011).

Tourist demand is determined by human needs, on one hand, and opportunities for satisfying these needs, expressed both with purchasing power of consumers and development of supply, on the other hand. Tourist demand can be analysed along a variety of dimensions: temporal, spatial and with reference to several product levels (types) – total demand, demand

for services grouped per types of operations, demand for particular product formats. Tourist demand may be measured with value (tourist expenditure) and quantitative indicators (volume and structure of tourist traffic). Both value and quantitative metrics are employed in scientific publications.

Middleton (1996) divides determinants of tourist demand into six groups:

- Economic – including elements like: real growth of income, appropriate distribution of income, stable financial situation, socio-economic standing.
- Demographic – including population, size and structure of households, standard of education, age, job structure, place of residence.
- Geographical – affecting destination preferences (climate, attractions of a country) and frequency of trips (impact of distance on the selection of a destination).
- Legal and political – encompassing regulations of tourist traffic, political developments.
- Psycho-social factors – grouped as follows: family, reference groups and opinion leaders, status and social roles, social classes and strata, culture and subculture, spending patterns, social norms.
- Media – influencing prevailing fashions and trends in tourism.

Economic determinants are undoubtedly of fundamental importance among the factors mentioned above. Their scope varies across economic theories, e.g. the classical economics lists prices, taxation, inflation, economic results, the institutional economics – effect of formal and informal institutions on operations of businesses and information asymmetry – as basic parameters. Dwyer et al. (2010) propose distinguishing pricing and other economic factors, stressing the importance of income and demographic variables among the latter group.

Li (2004, 2006a, 2006b) sees tourist expenditure as the fundamental variable of tourist demand. Au and Law (2000, 2002) assumed tourist spending on particular tourist products (meals, sightseeing, shopping) to be the key independent variable of the demand.

This review of the literature leads to the conclusion that economic, in particular income, and demographic factors are major growth factors of tourist demand. This is in link with forecasts of the tourist market development compiled by Henley Centre Headlight Vision and GDS Amadeus (2007), which indicate the following trends:

- Increase of the global population – the UN estimates there will have been 8 billion people worldwide by 2025,

- Business globalisation – development of global trade will boost transnational flows of goods, services, and capital. According to the National Intelligence Council, the world economy will continue to grow and will have grown more than 80% by 2020 compared with 2000. Globalisation of business and politics will contribute to greater requirements for international travel. Liberalisation of global trade will bring about a number of social shifts (e.g. international alliances of culture, ideas and models of behaviour),
- Rise of global migration – increasing numbers of migrants generate the need for international travel. Many people feel strong attachment to their native countries and have a number of reasons to return – for visiting friends and relatives. The UN figures indicate there are about 180 million emigrants worldwide, and the number is bound to grow to 250 million before 2050,
- Globalisation has made tourism a major sector of economy in the last decade. The World Trade Organisation predicts the number of international trips will exceed 1.56 billion by 2020. The overall number of tourists in the 15 largest states will have nearly doubled by 2020 (from 433 million to 837 million),
- Growing ranks of the wealthy – tourism presumes well-off consumers to a significant extent. Disposable income of West European households has risen considerably in the last decade. On the other hand, emergence of a wealthy middle class in Brazil, Russia, India or China may have key impact on the travel market in future,
- Rising importance of low-cost airlines,
- Development of state-of-the-art technology – providing broader access to a range of travel while cutting its costs.

It must be concluded that economic variables are the key factors determining tourist demand. These conditions are defined by such indicators as: gross national product, income structure of society, real wages, rate of unemployment, and balance of payments. Additional economic factors influencing consumer decisions include pricing and dispensable income. These are two crucial factors at play in the process of selecting a tourist destinations. An economic slump has an adverse effect on living standards and structure of consumption. Economic crises also cause standing of enterprises to decline. As a consequence, company social benefit funds are reduced, including resources for tourism, integration or business trips are cut. This restricts tourist demand.

## 2 Methods

Factors affecting development of tourism were determined using the statistics available with AMECO database and the website of National Statistical Office of Slovakia and the Polish National Office for Statistics (GUS).

The analysis employed a panel model containing variables followed in two dimensions: spatial and temporal. Panel data may be analysed by estimating them with the ordinary method of least squares, fixed effects model and random effects model (Gruszecki, 2002). The importance of panel models has been emphasised by Griliches and Intriligator (2007) and Baltagi (2003).

Data analysis in this paper used the ordinary method of least squares. Its panel model is estimated based on the formula (Kufel, 2013):

$$y_{it} = x_{it} \beta + v_{it}$$

where:

$y_{it}$  – dependent variable,

$x_{it}$  – independent variable (in general, the vector of independent variables),

$\beta$  –  $N$  dimension vector of the model's structural parameters,

$v_{it}$  – total sampling error, consisting of a purely sampling part  $\varepsilon_{it}$  and individual effect  $u_i$  that refers to a specific,  $i^{\text{th}}$  unit of the panel ( $v_{it} = \varepsilon_{it} + u_i$ )

Three selected factors are evaluated that potentially influence changes in numbers of domestic and international trips in two countries, that is, Poland and Slovakia, in 2005-2014. Assuming the respective areas (states) are indexed  $i = 1, \dots, N$  and time units are indexed  $t = 1, 2, \dots, T$ , the following model was constructed:

$$T_{it} = \alpha_{it} + P_{it} + W_{it} + E_{it} + v_{it}$$

where:  $T_{it}$  – **the dependent variable**: long-term domestic and international trips in thousands of persons.

### **Independent variables:**

$P_{it}$  – population, 1000s.

$W_{it}$  – wages per 1000 heads.

$E_{it}$  – employment per 1000 heads.

$\alpha_{it}$  – structural parameter of the model

$v_{it}$  – total sampling error.

Selection of independent variables was reasonable. The population numbers were chosen from among demographic determinants as a primary factor affecting tourist demand in

highly and medium-developed countries. Wages and employment, on the other hand, are economic conditions that directly influence consumers' income and emergence of a disposable consumption fund. White test, helping to assess homogeneity of random component variance and to determine the independent variable responsible for heteroscedasticity, was employed to verify the model. GNU Regression Econometric and Time-Series Library – GRET, which supplies advanced econometric methods, was employed in the calculations.

### 3 Research

Estimation by means of the ordinary method of least squares (OMLS) is acceptable if the individual effect is absent and a panel is treated as a set of cross-sectional data (Kufel, 2013). This is true of the model studied here. The dependent (endogenous) variable is assumed to denote long-term domestic and international trips, designated as  $T_{i,t}$ . Independent (exogenous) variables, on the other hand, are:  $P_{i,t}$  - population,  $W_{i,t}$  - wages,  $E_{i,t}$  – employment.

The estimation shown in Table 1 resulted from application of GRET econometric software. The table contains results of estimation of the panel model examined by means of the least squares method.

**Tab.1: Estimation results for panel data concerning the variable of long-term domestic and international trips – the least squares method (LSM)**

Model 1: LSM Panel Estimations based on 20 observations 2 units of cross-sectional data are included Length of the time series = 10 Dependent variable (Y): $T_{i,t}$					
Variable	Coefficient	Standard error	Student's t	p-value	Significance <sup>1</sup>
Const	-2374.64	751.272	-3.1608	0.0061	***
$P_{i,t}$	2.65862	0.510995	5.2028	<0.0001	***
$W_{i,t}$	21.8876	3.63184	6.0266	<0.0001	***
$E_{i,t}$	-22.1318	3.90345	-5.6698	<0.0001	***
Arith. mean of dep. vari.		11102.05	Stand.dev. of dep. vari.		7619.278
Total residuals squared		19490035	Standard error of residuals		1103.688
Coeff. of determination, R-squared		0.982330	Corrected R-squared		0.979017
F(3, 16)		296.5001	P value for F test		3.15e-14
Log likelihood		-166.2756	Akaike's inf. crit.		340.5512
Bayes-Schwarz criterion		344.5341	Hannan-Quinn crit.		341.3287
Autocorrelation of residuals - rho1		0.467414	Durbin-Watson statistic		1.008251

<sup>1</sup> \*\*\*the variable becomes significant at the significance level of 1%

Source: The authors' own research.

In order to assess quality of the econometric model developed, significance levels of impact of the particular independent variables, that is, numbers of people, wages and employment, on the dependent variable, i.e. numbers of long-term domestic and international trips, were evaluated by means of Student's t-test. All the variables in the estimated model are significant at the level of 1%. This shows the three variables studied are very strong stimulators of domestic and international trips in the countries examined.

According to F-Snedecor test, which allows for a comprehensive assessment of utility of an econometric model, the estimated model can be said to contain significant variables.

The coefficient of determination R-squared, representing goodness of fit of a regression formula to empirical data, is 0.982330. This means more than 98% of the dependent variable's variance is explicated by the combined variance of all independent variables. This is a highly satisfactory result.

The results produced by the panel model are confirmed by economic analysis of the problem at hand. Income of individual households is commonly considered the key economic factor operating in the macro-environment of the tourist market which determines demand. In turn, earnings constitute the bulk of income generated by households.

It should be pointed out tourist requirements are higher-order needs and tourist demand can be satisfied as part of the so-called free consumption fund. The fund emerges only after basic needs have been met. This means income of a household must be sufficiently large and factors driving tourist demand so powerful that a consumer chooses tourist products as part of this fund. Thus, tourist consumption emerges only above a certain threshold of income. The steadily rising wages and employment (resulting in higher income of the population) in the Polish as well as partly also in Slovak economy have increased the free consumption fund and incidence of domestic and internal travel. It proofs a positive correlation between these variables. In addition, the dynamic demographic transformations are of escalating importance to demand in the tourism market. The growing and ageing populations of both Slovakia and Poland have been taking more and more domestic and international trips, as the share of the elderly, who travel more intensively after retirement, in the demographic structure increases and the process of hiring foreign staff by developed countries spreads, resulting in development of family tourism (visits).

The White test, used to verify if residual variance in a model is constant, that is, whether the sampling component is homoscedastic and the test for normal distribution of residuals, were employed to verify the model in more depth.

**Tab. 2: White test for heteroscedasticity of residuals** (variability of residual variance)

CMLS estimation based on 20 observations					
Dependent variable (Y): uhat <sup>2</sup>					
	Coefficient	Standard error	Student's t	p-value	Significance <sup>1</sup>
Const	1.30440e+08	3.73740e+07	3.490	0.0058	***
P_i_t	-36066.7	13272.8	-2.717	0.0217	**
W_i_t	-91601.3	56258.8	-1.628	0.1345	
E_i_t	95702.3	59071.5	1.620	0.1363	
sq_P_i_t	1.23741	1.69553	0.7298	0.4823	
X2_X3	42.2353	29.8072	1.417	0.1869	
X2_X4	-35.3563	29.4083	-1.202	0.2570	
sq_W_i_t	242.366	145.050	1.671	0.1257	
X3_X4	-476.177	292.107	-1.630	0.1341	
sq_E_i_t	225.999	145.417	1.554	0.1512	
Coeff. of determination, R-squared = 0.729724					
Zero hypothesis: heteroscedasticity is absent					
<b>Test statistics:</b> TR <sup>2</sup> = 14.594480					
where p = P(Chi-squared(9) > 14.594480) = 0.102694					

<sup>1</sup> \*\*\* the variable becomes significant at the significance level of 1%

\*\* the variable becomes significant at the significance level of 5%

Source: The authors' own research.

Homogeneity of the random component's variance was evaluated by means of White test, which assumes checking significance of regression established for squared residuals with a set of a model's variables, their squares and products of their multiplication.

The determined likelihood of error (p=0.102694) indicates no grounds for rejecting the zero hypothesis. In addition, the critical ch-square value for the significance of 0.05 and for the 9<sup>th</sup> degree of freedom is 16.91, while TR<sup>2</sup>= 20\*R<sup>2</sup>=14.594480 <16.91. This demonstrates homogeneity of the variance, that is, all the diverging observations are correctly described by the model.

## Conclusion

Numbers of factors determining size and structure of demand in the tourist market vary dynamically, both in time and space, as the tourism itself changes. The United Nations World Tourism Organization (UNWTO) divides factors of tourism development, numbering more than 130, into three groups: economic (including general economic, income, and price factors), socio-psychological (including leisure, demographics, industrialisation, urbanisation, culture, motivations), supply (including tourist policies, transport, accommodation facilities, travel organisers). Three selected factors affecting tourist demand, i.e. population, wages, and employment, are discussed in the paper presented. Impact of these determinants on incidence of long-term domestic and international trips in Slovakia and Poland in the time frame 2005-



2014 has been examined. Statistics available in AMECO database have been utilised and panel model have been constructed, estimated by means of the general least squares method.

The analysis has led to the following conclusions:

1. Earnings of households and levels of employment, both economic factors, have significant impact on numbers of long-term domestic and international travel. This is proven by the fact these factors are at the significance level of 1%.
2. Number of population significantly affects incidence of long-term domestic and international travel reported by inhabitants of a given country, as demonstrated by the significance of 1%.

In model 1 the coefficient of determination was 0.982330. This means that more than 98% of the dependent variable's variance have been explicated by the combined variance of all the independent variables. This is highly satisfactory result. In addition, result of F-Snedecor test for the model confirm the estimated model contain significant variables.

Verification of the models examined by means of White test demonstrated heteroscedasticity of residuals (variability of residual variance) does not obtain.

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