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THE INTERNATIONAL DEMAND FOR EUROPEAN TOURISM IN THE COUNTY OF PRIMORJE-GORSKI KOTAR

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The paper studies the demand for European tourism in the County of Primorje-Gorski kotar. First an attempt to model geometrically the demand for European tourism in the County of Primorje-Gorski kotar is given, follow by the choice and the descriptions of the dependent variable and a number of explanatory variables. The analysis is based on the Almost Ideal System of Demand, which provides a useful framework for modelling tourism demand across destinations.

Key words: the AIDS model, County of Primorje-Gorski kotar, European tourism demand.

INTRODUCTION

Tourism is very important for the Croatian economy today and a fundamental factor of development of the County of Primorje-Gorski kotar. It is one of the largest services exporting sector and the fastest rowing industry in the world. According to the WTO, the majority of all international tourists in the world travel to or within Europe. Therefore, strategic goals of tourism development in the County of Primorje-Gorski kotar, in nowadays specific transitional conditions, are reconstruction, fuller evaluation and protection of tourist potentials and repositioning Croatia on the tourist market as one of the leading tourist destinations in Europe and in the Mediterranean. Hence, is important to understand how tourism receipts evolve, i.e., how tourism demand behaves.

Despite its importance for the Croatia economy, however, applied economists have not paid much attention to tourism.

1. THE SPECIFICATION OF THE THEORETICAL TOURISM DEMAND MODEL

Empirical econometric models play a key role in studying tourism behaviour. They main objective is to provide an explanation of the economic behaviour underlying

the data generating process. However, "models are simplifications of the reality and they can differ radically in the reliability with which they portray the phenomena they are intended to explain"[1]. Therefore, empirical econometrics models are fundamental to explain the behaviour of economic phenomena, but the analysis of the researcher is essential to give coherence and substance to the empirical findings.

The general international tourism demand model commonly estimated is:

$$DT_{ij} = F\left(Y_j, TC_{ij}, RP_{ij}, ER_{ij}, QF_i\right), \text{ where}$$

- DT_{ij} = demand for international travel services by origin *j* for destination *i*;
- Y_j = income of origin *j*;
- TC_{ij} = transportation cost between destination *i* and origin j;
- RP_{ij} = relative prices (i.e., the ratio of prices in destination *i* to prices in origin *j* and in alternative destinations),
- ER_{ij} = currency exchange rate, measured as units of destination *i*´s currency per unit of origin *j*´s currency;
- QF_i = qualitative factors in destination *i*.

Most of the existing econometric analyses of international tourism demand have followed the single equation models. The limitations of a single equation approach lead some researcher to implement a system demand approach. Relatively few studies have used a complete system demand approach. Recently the AIDS – Almost Ideal Demand System - model has been applied to estimate tourism demand due to the problems inherent in using single equation models. The AIDS model, developed by Deaton and Muellbauer (1980) provides a well structured framework for modelling tourism demand.

The model is based on economic theory and satisfies the axioms of choice and can be used to test homogeneity and symmetry restrictions. In its final formulation, the AIDS model is expressed as follows for the i-th country:

$$s_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln\left(x / P^*\right), \quad i, j = 1 \ldots \text{n}, \quad \text{where}$$

$$\ln P^* = \alpha_0 + \sum_{i=1}^{n} \alpha_i \ln p_i + \frac{1}{2} \sum_{j=1}^{n} \sum_{i=1}^{n} \gamma_{ij} \ln p_i \ln p_j$$

- s_i = share of tourism expenditure allocated in destination country *i* to total tourism expenditure in *n* destinations;
- p_j = price of tourism in destination country *j*;
- x = total per capita expenditure allocated in all *n* destinations;
- P^* = weighted price indices for all the countries.

[1] Syriopoulos, T. C. and Sinclair, M. T., 1993.

These equations are the basic equations for the AIDS model and represent a non–linear system of equations.

The theoretical properties from the consumer demand theory impose the following parametric restrictions:

$$\sum_{i=1}^{n} \alpha_i = 1 \quad \sum_{i=1}^{n} \gamma_{ij} = \sum_{i=1}^{n} \beta_i = 0$$

$$\sum_{j=1}^{n} \gamma_{ij} = 0 \quad \forall i \text{ and } \gamma_{ij} = \gamma_{ji} \quad \forall i, j$$

These restrictions are necessary if the model is to be consistent with the basic axioms of demand and utility theory.

The AIDS model permits the derivation of the complete set of relevant elasticities, including the expenditure elasticities and the price elasticities, compensated and uncompensated. For the case in question the formulae for these elasticities are (Hahn, 1994):

$\varepsilon_i = \frac{\beta_i}{s_i} + 1$ Expenditure elasticities

$\varepsilon^u{}_{ii} = \frac{\gamma_{ii}}{s_i} - \beta_i - 1 \quad i = j$ Uncompensated own-price elasticities of demand

$\varepsilon^u{}_{ij} = \frac{\gamma_{ij}}{s_i} - \beta_i \frac{s_j}{s_i} - 1 \quad i \neq j$ Uncompensated cross-price elasticities of demand

$\varepsilon^c{}_{ii} = \varepsilon^u{}_{ii} + s_i \varepsilon_i \quad i = j$ Compensated own-price elasticities of demand

$\varepsilon^c{}_{ij} = \varepsilon^u{}_{ij} + s_j \varepsilon_i \quad i \neq j$ Compensated cross-price elasticities of demand

These supply crucial information about the interdependencies of competing products and allow for formal tests of the validity of the assumption about consumer behaviour within the sample set of observations.

2. SPECIFICATION OF THE MODEL AND DEFINITION OF THE VARIABLES

The theoretical model adopted in this paper requires the definition of the used variables and the choice of the destination and the origin countries.

As origin countries was considered a group of 12 countries with the highest number of tourist nights realised in the analyzed time period (1996-2000). These countries are: Austria, the Czech Republic, Italy, Hungary, Germany, Slovenia, Bosnia and Herzegovina, Netherlands, Poland, Slovakia, Great Britain and Sweden. As destinations, we considered only two countries: on one hand the County of Primorje-Gorski kotar, and on the other hand the group of other six coastal Croatian counties (considered as one country): County of Lika-Senj, County of Zadar, County of Šibenik-Knin, County of Split-Dalmatia, County of Istria and the County of Dubrovnik-Neretva. These counties are similar for geographical and economic (tourism contributes significantly to the balance of payments) reasons as well as for natural and climatic attributes.

The Dependent Variable

In almost all recently published papers the dependent variable is broadly classified as tourist arrivals / or departures, tourist expenditure and/or receipts, travel exports and/or imports, length of stay, night spent at tourist accommodation and other[2]. The dependent variable s_i is the tourism expenditure in destination country i as a percentage of the aggregate tourism expenditure in all destination Croatian countries under consideration. Expenditure s_i is obtained (Tab. 1) by considering the number of nights by country of residence:

$$s_i = \frac{T_i}{T_1 + T_2} = \frac{\sum_{j=1}^{n} T_{ij}}{\sum_{j=1}^{n} T_{1j} + \sum_{j=1}^{n} T_{2j}} \qquad i=1, 2$$

- s_i = share of tourism expenditure allocated in destination country i to total tourism;
- T_1 = total tourist nights in the County of Primorje-Gorski kotar;
- T_2 = total tourist nights in other coastal counties.

The Explanatory Variables

The number and the type of explanatory variables used in recently carried out studies of the international tourism demand are different. The most frequently used explanatory variables are: the level of income, relative prices of good and services purchased by tourists in the destination, transportation cost, exchange rates, qualitative

[2] Lim, C., 1997.

factors (political, social and sporting events in a destination, destination attractiveness, trip motive and others).

The set of explanatory variables used in the model includes tourism prices and the total tourist expenditures.

Table 1. **The average expenditure share in the County of Primorje-Gorski kotar and in other coastal counties**

Year	Expenditure share in the County of Primorje-Gorski kotar	Expenditure share in other coastal counties
1996	0,26451	0,73549
1997	0,30122	0,69878
1998	0,24942	0,75058
1999	0,25440	0,74560
2000	0,25528	0,74472

Tourism prices are the second[3] most frequently used explanatory variables. They represent the costs of goods and services that tourists are likely to pay while at the destination. It is desirable to have indices constructed using a basket of goods purchased by tourists. The price set may consist of the tourism or the exchange rate adjusted level of consumer prices (number of currency units of destination country *i* required to buy one currency unit of origin country *j*). In other words, the index measures for, say, Italian tourists in Croatian Counties, the evaluation of Italian's cost living adjusted for changes in the Kuna / Euro exchange rate.

The *price* set in the model consists of the price indices of hotel and restaurant services in the County of Primorje-Gorski kotar and of the average price indices of hotel and restaurant services in the other coastal counties.

Due to data unavailability price indices of Hotel and Restaurant services in the other six coastal counties (considered as one) we refers to the price indices of Hotel and Restaurant services for the Republic of Croatia and they are obtained from the Statistical Yearbook 2002. Table 2 reports the price indices used to set up the econometric model.

Table 2. **Price Indices of Hotel and Restaurant Services**

Year	1996	1997	1998	1999	2000
County of Primorje-Gorski kotar	92,0	100,0	107,2	108,2	110,1
Other coastal counties	98,4	100,0	103,0	104,9	107,4

Source: Statistical yearbook, 2001.

[3] The most frequently used explanatory variable is the income in the origin country.

The *Expenditure* consists of the real per capita expenditure. To obtain per capita data, we must divide the total tourism expenditure for each origin country j by the number of origin country j tourists in all the destination countries under consideration (i.e., expenditure of Italian tourists in one year / number of Italian tourists in that year in all the seven Croatian counties under consideration). Total expenditure x (Tab. 6) allocated in all *n* destinations is obtained as:

$$x = \frac{t_1 + t_2}{T_1 + T_2}, \text{ where}$$

- t_1 = total turnover in hotel and restaurant enterprises in the County of Primorje-Gorski kotar;
- t_2 = total turnover in hotel and restaurant enterprises in other coastal counties;
- T_1 = total tourist nights in the County of Primorje-Gorski kotar (Tab. 4);
- T_2 = total tourist nights in other coastal counties (Tab.5).

Turnover (Table 3) is a value of sold goods and services on the market irrespective of the fact whether they are paid or not, with VAT included.

Table 3. **Turnover in Hotel and Restaurant Enterprises (000 kn) in the counties under consideration**

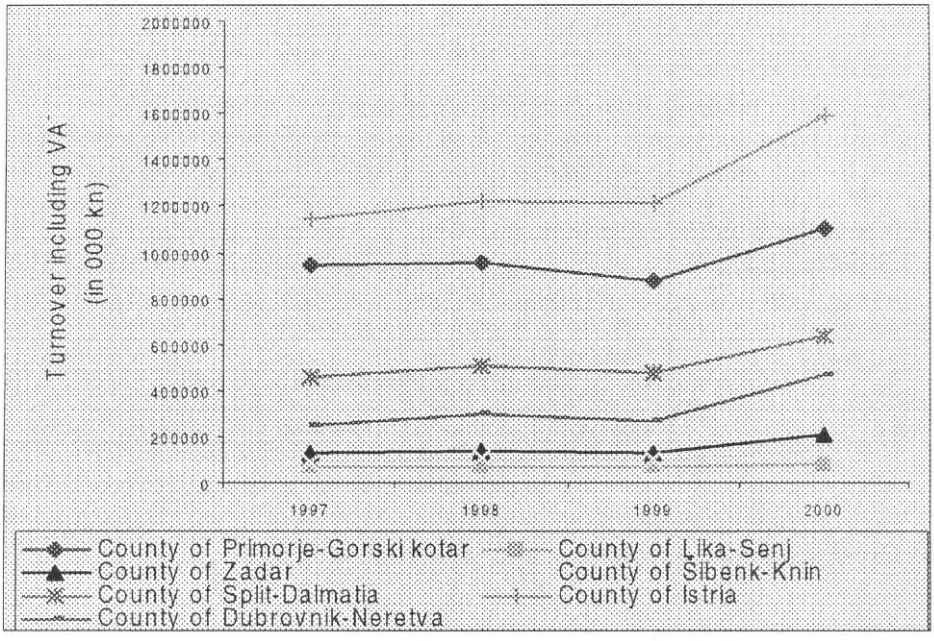
	1996	1997	1998	1999	2000	2001
County of Primorje-Gorski kotar	794 519	947 992	952 439	870 901	1 103 230	1 239 506
County of Lika-Senj	65 947	71 967	73 940	71 780	82 196	95 653
County of Zadar	79 510	127 214	143 290	126 042	213 588	278 314
County of Šibenik-Knin	54 874	92 591	104 502	95 898	138 785	178 790
County of Split-Dalmatia	374 920	461 490	509 897	479 143	635 255	738 714
County of Istria	927 530	1 142 082	1 222 943	1 217 375	1 588 451	1 843 710
County of Dubrovnik-Neretva	140 380	245 558	295 637	269 071	463 457	573 406
Oother counties	**1643161**	**2140902**	**2350209**	**2259309**	**3121732**	**3708587**

Source: Statistical yearbook, 2001.

Figure 1 gives the performance of the turnover for the destinations counties.

Table 4 and 5 show the tourist nights by country of residence in the County of Primorje-Gorski kotar and in the other coastal counties.

Figure 1. **Turnover in Hotel and Restaurant Enterprises (000 kn) in the counties under consideration**



Source: Table 2

Table 4. **Tourist nights by country of residence in the County of Primorje-Gorski kotar**

Origin countries	1996	1997	1998	1999	2000
Austria	731261	950 618	913217	720 887	954 993
Czech Republic	738 033	904 480	720 743	566 995	829 236
Italy	662 987	1 035 610	1 134 811	762 484	1 262 282
Hungary	205 649	280 193	284 540	307 704	457 889
Germany	1 069 843	1 517 966	1 599 936	1 134 758	1 961 574
Slovenia	912 984	1 159 191	1 205 880	1 249 597	1 367 252
Bosnia and Herzegovina	37 436	54 621	58 833	65 207	74 320
Netherlands	56 249	114 573	112 466	88 006	131 350
Poland	68 785	151 363	177 611	126 834	289 917
Slovakia	145 033	215 416	212 148	136 584	187 939
Great Britain	8 562	30 785	24 208	15 241	19 269
Sweden	8 472	14 906	17 730	13 489	18 533
Total	**4645294**	**6429722**	**6462123**	**5187786**	**7554554**

Source: Statistical yearbook, 2001.

Table 5. **Tourist nights by country of residence in other coastal counties**

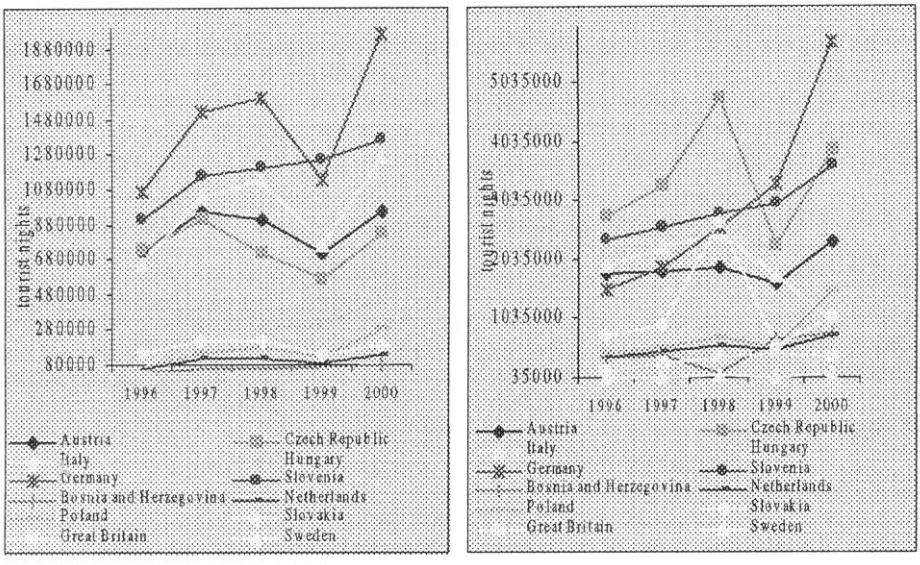
Origin countries	1996	1997	1998	1999	2000
Austria	1796285	1844905	1914143	1615533	2331558
Czech Republic	2785320	3275597	4796803	2271140	3886741
Italy	1923765	2239911	2473558	1761684	988901
Hungary	420383	453425	390084	489930	937421
Germany	1538295	1892386	2589357	3315416	5722362
Slovenia	2386287	2564720	2824226	2975871	3631403
Bosnia and Herzegovina	358259	408365	87120	665115	784318
Netherlands	358394	484943	570822	494186	754437
Poland	428552	540468	708506	540619	1499177
Slovakia	732856	899791	2678944	582071	1055455
Great Britain	152832	264825	358129	455958	358430
Sweden	35253	46837	55051	36698	87963
Total	**12916481**	**14916173**	**19446743**	**15204221**	**22038166**

Source: Statistical yearbook, 2001.

In order to provide further insights into the course of the tourist nights by country of residence a diagrammatic analysis is given in figure 2.

Figure 2. **Tourist nights by country of residence**

(a) County of Primorje-Gorski kotar (b) Other coastal counties



Source: Table 3 and 4.

To simplify computations Deaton and Muellbauer suggest to approximate ln P^* by:

$$\ln P^* = \sum_{j=1}^{n} s_j \ln p_j .$$

Tourism demand can also be sensitive to special explanatory factors such as: advertising campaigns, political disturbances, sporting attractions, international fairs or changing tastes.

The model have been estimated via Zellner's (1962) iterative approach, mainly used to estimate seemingly unrelated regression, on yearly data 1996-2000 for 12 countries.

Table 6. **Per capita expenditure for the estimated period time (kn)**

Year	Per capita expenditure
1996	138,806
1997	144,707
1998	127,472
1999	153,502
2000	142,770

3. STATISTICAL RESULTS

Table 7 reports the estimates and the basic statistics for the AIDS model which was estimated using time series data for the period 1996-2000. The origin countries were: Austria, the Czech Republic, Italy, Hungary, Germany, Slovenia, Bosnia and Herzegovina, Netherlands, Poland, Slovakia, Great Britain and the Sweden. The equations for calculate the share for tourism expenditure are:

the share for tourism expenditure in the County of Primorje-Gorski kotar:

$$s_1 = \alpha_1 + \gamma_{11} \ln p_1 + \gamma_{12} \ln p_2 + \beta_1 \ln\left(x/P^*\right)$$

the share for tourism expenditure in the other coastal counties:

$$s_2 = \alpha_2 + \gamma_{21} \ln p_1 + \gamma_{22} \ln p_2 + \beta_2 \ln\left(x/P^*\right)$$

Table 7. **Results of the AIDS model**

	County of Primorje-Gorski kotar	Other coastal counties
Coefficient	α_1= 0,21823056	α_2= 0, 78176944
	γ_{11}= – 0,02046596	γ_{21}= 0,02046596
	γ_{12}= 0,02046596	γ_{22}= – 0,02046596
	β_1= 0,14773236	β_2= – 0,14773236

Source: Statistical analysis

Introducing the coefficient's values in the equations we have:

the share for tourism expenditure in the County of Primorje-Gorski kotar:

$$s_1 = 0{,}21823056 - 0{,}02046596 \ln p_1 + 0{,}02046596 \ln p_2 + 0{,}14773236 \ln\left(x/P^*\right)$$

the share for tourism expenditure in the other coastal counties:

$$s_2 = 0{,}78176944 + 0{,}02046596 \ln p_1 - 0{,}02046596 \ln p_2 - 0{,}14773236 \ln\left(x/P^*\right)$$

The own price coefficient γ has the expected negative sign.

An important characteristic of demand is the relationship among market price, quantity demand and consumer expenditure

The nature of demand is such that a reduction in market price will usually lead to an increase in quantity demanded. Given that consumer expenditure is the product of these two variables, the effect of a price reduction will have an uncertain impact on this expenditure.

In some cases a reduction in price will be more than offset by a large increase in quantity demanded - a situation where demand is *price sensitive* or price elastic.

$(P_{mkt} \downarrow)\ (Q_{demanded} \uparrow) = \text{Expenditure} \uparrow$

In other cases, the reduction in price results in a proportionally smaller increase in quantity demanded-a situation where demand is *price insensitive* or price inelastic.

$(P_{mkt} \downarrow)\ (Q_{demanded} \uparrow) = \text{Expenditure} \downarrow$

The calculated total expenditure elasticities are:

$\mathcal{E}_1$ = 1,557551 county of Primorje –Gorski kotar

$\mathcal{E}_2$ = 0,799013 other coastal counties

Table 8 illustrates the estimated uncompensated and compensated price elasticities. All the elasticities are estimated at the average expenditure shares. The own price elasticities of demand (i=j) are negative, implying that the postulates of demand are satisfied. The cross-price elasticities of demand (i≠j) also are negatives, indicating complementariety.

Table 8. **Compensated and uncompensated price elasticities (All the elesticities are estimated at the average expenditure shares)**

Uncompensated price elasticities		
	County of Primorje–Gorski kotar	Other coastal counties
County of Primorje –Gorski kotar	$\varepsilon_{11} = -1,22497$	$\varepsilon_{12} = -1,33258$
Other coastal counties	$\varepsilon_{21} = -0,91890$	$\varepsilon_{22} = -0,88011$
Compensated price elasticities		
County of Primorje –Gorski kotar	$\varepsilon_{11} = -0,81227$	$\varepsilon_{12} = -0,18773$
Other coastal counties	$\varepsilon_{21} = -0,70720$	$\varepsilon_{22} = -0,29281$

Source: Statistical analysis

CONCLUSIONS

In this paper a version of the AIDS model for the international tourism in the County of Primorje-Gorski kotar was set up. The variables introduced and the statistical results were discussed. The obtained results from the econometric analysis may be considered as reasonably satisfactory and consistent from an econometric point of view, despite the fact that it has sometimes been difficult to provide satisfactory economic explanations for some of the coefficients.

One of the limitations of the analysis arises from the fact that the used time period 1996-2000 is too short to provide significant results. Further limitations arise from the fact that the data necessary to set up an explicitly dynamic AIDS model were not available and the econometric analysis has been based on aggregate tourists flow, rather then on micro data.

A final remark is that the tourism sector appears as a relatively "virgin territory" for econometric analysis. There are many possibilities for further research.

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Sažetak

MEĐUNARODNA POTRAŽNJA ZA EUROPSKIM TURIZMOM U PRIMORSKO-GORANSKOJ ŽUPANIJI

U ovom se radu razmatra potražnja za europskim turizmom u Primorsko-goranskoj županiji. Rad započinje pokušajem ekonometrijskog modeliranja potražnje za turizmom u Primorsko-goranskoj županiji. Slijedi odabir i objašnjenje zavisne varijable i broja nezavisnih varijabli.
Analiza je temeljena na Almost Ideal Demand System (AIDS) modelu, koji predstavlja koristan konceptualni okvir modeliranja potražnje za turizmom među destinacijama.

Ključne riječi: AIDS model, Primorsko-goranska županija, europska potražnja za turizmom.

Zusammenfassung

DIE INTERNATIONALE NACHFRAGE DES EUROPÄISCHEN TOURISMUS IM KOMITAT VON PRIMORJE UND GORSKI KOTAR

In dieser Arbeit wird die Nachfrage des europäischen Tourismus im Komitat von Primorje und Gorski kotar erörtert. Die Arbeit beginnt mit dem ekonometrischen Modelierungsversuch der Nachfrage des Tourismus in dem Komitat von Primorje und Gorski Kotar. Es folgt eine Auswahl und eine Erklärung einer Anzahl von abhängigen und unabhängigen Variablen. Die Analyse basiert auf dem Almost Ideal Demand System (AIDS) Model, welches einen nützlichen konzeptuelen Modelierungsrahmen der Nachfrage des Tourismus zwischen den Destinationen darstellt.

Schlüßelwörter: AIDS Model, Komitat von Primorje und Gorski kotar, europäische Nachfrage des Tourismus.