

Using the Factor Analysis Method to Shape the Tourist Profile of Several European Countries by the Age Group of Tourists

Jugănaru Ion Dănuț
„Ovidius” University of Constanța, Faculty of Economic Sciences
djuganaru@univ-ovidius.ro

Abstract

Tourism can bring a significant contribution to the development of every national economy, but also of the European economy as a whole. Against this background, we consider it appropriate to discuss the new challenges currently facing tourism in Europe, such as demographic change and consumer behavior.

This paper analyzes the age group structure of the resident tourists from 29 European countries, in terms of the domestic trips taken in 2016. On the one hand, the quantitative results (obtained by processing the values of the indicator “number of tourists”, by the CFA method) highlight the size of the domestic tourist traffic and, on the other hand, they shape the tourist profile of each country, in terms of the size and share of each age category of tourists. Moreover, these results enrich the knowledge of the tourists’ behavior in terms of their age, representing a useful tool when structuring the domestic tourist supply.

Key words: length of stay, correspondence factor analysis, resident tourists, age

J.E.L. classification: C10, C38, L83, M31, Z32

1. Introduction

Seen as a possible area of important growth in the European economy, tourism is currently facing new challenges that it needs to identify and consider when organizing its activities. The most significant challenges includes: the digitization of distribution channels; the development of a new sector – i.e. the collaborative economy (which involves switching to new business models, due to the new technologies that are changing rapidly; many actors in the collaborative economy sector are part of the economy of travel services); increasing competition from destinations in cheaper emerging third markets; the changing behavior of consumers/tourists; orientation towards experience-based tourism; increased demand in terms of more specialized tourism; demographic aging in Europe and the seasonality of tourist activities (see European Parliament resolution of 29 October 2015 on new challenges and concepts for the promotion of tourism in Europe).

In this context, we conducted this study, which mainly aims at shaping the tourism profile of 29 European countries. The results obtained by the CFA (Correspondence Factor Analysis) method regarding the tourists’ representativeness (expressed in absolute and relative values) per each age group, for each analyzed country, allowed us to achieve both the main and the secondary objectives, represented by some comparative interpretations of the size and structure of the tourist traffic, in each analyzed country.

The originality of the paper is represented by the combination of the scientific methods used in order to process the database. Based on the physical and quantitative indicator of the tourist traffic, i.e. the number of tourists (Snak *et al*, 2001; Minciu 2004), these methods allowed us to identify some aspects of the resident tourists’ purchasing and/ or consumption behavior, in terms of the domestic trips taken in 2016.

2. Creating an appropriate research framework

For the purpose of this study, we collected the Eurostat data (from the Data Explorer menu) on the "number of tourists" indicator. It is noteworthy that the study is based only on the data regarding the number of resident tourists (per total and per age category, as entered and used in international statistics), which form the domestic tourism of each analyzed country, in 2016.

The scientific working tools are represented by the exploratory statistical method known as "correspondence factor analysis" (CFA) and the SPSS (Statistical Package for Social Sciences) software.

The concepts and definitions used in this study are consistent with the specifications described in the "Methodological Handbook for Tourism Statistics", International Recommendations for Tourism Statistics (United Nations and UNWTO, 2008).

3. Data, results and discussions

The correspondence table, seen as the starting point of our research, shows the distribution of statistical units in terms of the simultaneous variation of two categories of the same variable, i.e. the distribution of "the number of tourists" per "country of residence" and "age group". The method used, i.e. correspondence factor analysis, describes the data from the correspondence table, highlighting their latent (hidden) structure, by reducing their dimensionality and by the geometric (visual) representation of the categories in a metric space. Following data processing, we obtained a series of statistical indicators calculated for the line-points.

Table no. 1: Correspondence table for the number of tourists that took domestic trips in 2016, per country of residence and main age groups

Country	Number of tourists per Age groups							Active Margin
	less than 15 years	from 15 to 24 years	from 25 to 34 years	from 35 to 44 years	from 45 to 54 years	from 55 to 64 years	65 years or over	
Belgium	0	203583	229944	355987	338543	357761	181290	1667108
Bulgaria	0	16761	17895	30991	22847	8681	4503	101678
Czech Republic	0	440743	616070	735660	583629	413641	318009	3107752
Denmark	0	0	0	0	0	0	0	0
Germany	0	4096536	4461597	4187831	5434972	4193099	4610249	26984284
Estonia	0	53399	110820	72671	52887	0	0	289777
Ireland	0	212833	318349	372014	307636	252610	218212	1681654
Greece	0	16299	42758	44889	35481	27261	11082	177770
Spain	0	1089991	1235219	1327002	1148549	742730	425519	5969010
France	0	1310274	1554280	1844145	1790820	2044726	2428949	10973194
Croatia	0	75673	70688	63474	46107	43371	19047	318360
Italy	662342	668725	855782	1140991	896233	662409	552682	5439164
Cyprus	0	42997	48611	36386	25092	16493	15051	184630
Latvia	0	67128	83550	85765	67522	48481	24875	377321
Lithuania	0	8914	8334	7421	7169	5080	6433	43351
Luxembourg	0	0	0	13149	6342	0	4364	23855
Hungary	230890	147490	222673	334826	255498	179983	199758	1571118
Malta	0	16105	23336	8730	14079	5597	0	67847
Netherlands	1072836	857766	985116	914245	980481	907168	934716	6652328
Austria	0	401015	467567	402862	536982	382492	364897	2555815
Poland	0	458720	636222	730329	451487	414557	264732	2956047
Portugal	118282	83455	87058	167517	128457	84742	59762	729273
Romania	0	4862	10797	8091	6281	4777	2254	37062
Slovenia	0	50042	77221	87215	68849	44281	30185	357793
Slovakia	0	149857	109017	130681	78028	164764	25813	658160
Finland	0	353974	487731	447250	442025	383009	416632	2530621
Sweden	0	542366	436424	461727	632523	296861	799361	3169262
UK	0	1139300	1322110	1833960	2490890	1852840	1878780	10517880
Switzerland	415842	426501	514544	506613	584594	445168	427750	3321012
Active Margin	2500192	12935309	15033713	16352422	17434003	13982582	14224905	92463126

Source: Eurostat data processed by SPSS

Each row in Table 1 shows **the number of tourists** who took domestic trips in 2016, in *each analyzed country*, distributed by *age groups*. Thus, each table row contains information about each country's profile in terms of the distribution/ structure of the number of resident tourists, by main age groups.

It is noteworthy that, in 2016, 92,463.126 resident tourists traveled in all 29 countries under analysis.

- As far as the number of resident tourists is concerned, the highest levels belong to the following countries: *Germany* (26,984,284 – *the 1st place*), *France* (10,973,194 – *the 2nd place*), the *UK* (10,517,880 – *the 3rd place*). The *Netherlands* (6,652,328 – *the 4th*), *Spain* (5,969,010 – *the 5th place*) and *Italy* (5,439,164 – *the 6th place*) continue this ranking, with significantly lower values, compared to the first three countries.

- The lowest levels regarding the number of resident tourists belong to the following countries: *Luxembourg* (23,855), *Romania* (37,062) and *Lithuania* (43,351).

- There are several groups of countries with higher and closer values as far as the number of the resident tourists who took domestic trips is concerned: *Switzerland* (3.321.012 – *the 7th place*), *Sweden* (3.169.262 – *the 8th place*) and the *Czech Republic* (3.107 .752 – *the 9th place*); *Poland* (2.956.047 – *the 10th place*), *Austria* (2,555,815 – *the 11th place*) and *Finland* (2,530,621 – *the 12th place*); *Ireland* (1,681,654 – *the 13th place*), *Belgium* (1,667,108 – *the 14th place*) and *Hungary* (1,571,118 – *the 15th place*).

Applying the CFA method involves calculating the *profiles of the categories of the first variable* (i.e. the relative frequencies of the "*country of residence*" category), which shows the distribution of the categories of the other variable (the main "*age groups*" of tourists) among the categories of the first variable.

Table no. 2: Row profiles for the distribution of the shares held by the number of tourists who took domestic trips in 2016, by country of residence and main age groups (Row Profiles output)

Country	Number of tourists per Age groups							Active Margin
	less than 15 years	from 15 to 24 years	from 25 to 34 years	from 35 to 44 years	from 45 to 54 years	from 55 to 64 years	65 years or over	
Belgium	.000	.122	.138	.214	.203	.215	.109	1.000
Bulgaria	.000	.165	.176	.305	.225	.085	.044	1.000
Czech Republic	.000	.142	.198	.237	.188	.133	.102	1.000
Denmark	.000	.000	.000	.000	.000	.000	.000	.000
Germany	.000	.152	.165	.155	.201	.155	.171	1.000
Estonia	.000	.184	.382	.251	.183	.000	.000	1.000
Ireland	.000	.127	.189	.221	.183	.150	.130	1.000
Greece	.000	.092	.241	.253	.200	.153	.062	1.000
Spain	.000	.183	.207	.222	.192	.124	.071	1.000
France	.000	.119	.142	.168	.163	.186	.221	1.000
Croatia	.000	.238	.222	.199	.145	.136	.060	1.000
Italy	.122	.123	.157	.210	.165	.122	.102	1.000
Cyprus	.000	.233	.263	.197	.136	.089	.082	1.000
Latvia	.000	.178	.221	.227	.179	.128	.066	1.000
Lithuania	.000	.206	.192	.171	.165	.117	.148	1.000
Luxembourg	.000	.000	.000	.551	.266	.000	.183	1.000
Hungary	.147	.094	.142	.213	.163	.115	.127	1.000
Malta	.000	.237	.344	.129	.208	.082	.000	1.000
Netherlands	.161	.129	.148	.137	.147	.136	.141	1.000
Austria	.000	.157	.183	.158	.210	.150	.143	1.000
Poland	.000	.155	.215	.247	.153	.140	.090	1.000
Portugal	.162	.114	.119	.230	.176	.116	.082	1.000
Romania	.000	.131	.291	.218	.169	.129	.061	1.000
Slovenia	.000	.140	.216	.244	.192	.124	.084	1.000
Slovakia	.000	.228	.166	.199	.119	.250	.039	1.000
Finland	.000	.140	.193	.177	.175	.151	.165	1.000

Sweden	.000	.171	.138	.146	.200	.094	.252	1.000
UK	.000	.108	.126	.174	.237	.176	.179	1.000
Switzerland	.125	.128	.155	.153	.176	.134	.129	1.000
Mass	.027	.140	.163	.177	.189	.151	.154	

Source: Eurostat data processed by SPSS

The figures in Table 2 show the distribution of the shares held by the number of resident tourists, per age groups (as used in international statistics) and countries. These figures provide a clear picture of each country's profile, as well as of the tourists' profile in each country.

Moreover, the same data can be used in order to highlight the ranking of each country, in order to compare them; furthermore, we can compare the individual values and the total average of the 29 countries under review. In this context, we highlight the following:

- The age group "*less than 15 years*" holds an average value of 2.7%. Over-average shares are held by all the five countries with tourists from this age group: Portugal (16.2%), the Netherlands (16.1%), Hungary (14.7%), Switzerland (12,5%) and Italy (12.2%);

- The age group "*from 15 to 24 years*" holds an average of 14%. The highest shares, above the overall average, belong to the following countries: Croatia (23.8%), Malta (23.7%), Cyprus (23.3%), Slovakia (22.8%) and Lithuania (20.6%). The lowest shares belong to the UK (10.8%) and Greece (9.2%);

- The age group "*from 25 to 34 years*" holds an average share of 16.3%. The highest shares, above the general average, belong to countries such as Estonia (38.2%), Malta (34.4%), Romania (29.1%), Cyprus (26.3%), Greece (24.1%), Croatia (22.2%), Latvia (22.1%) and Poland (21.5%). The lowest shares, compared to the average, were in Portugal (11.9%) and the UK (12.6%);

- The age group "*from 35 to 44 years*" holds an average share of 17.7%. The highest shares, above the general average, belong to the following countries: Luxembourg (55.1%), Bulgaria (30.5%), Greece (25.3%), Estonia (25.1%), Poland (24.7%), Slovenia (24.4%); the lowest shares belong to Malta (12.9%), the Netherlands (13.7%), Switzerland (15.3%), Germany (15,5%) and Austria (15.8%);

- The age group "*from 45 to 54 years*" has an average share of 18.9%. The highest shares, above the average, belong to the following countries: Luxembourg (26.6%), the UK (23.7%), Bulgaria (22.5%), Austria (21%), Belgium (20.3%), Greece and Sweden (20%). The lowest shares are held by Slovakia (11.9%), Cyprus 13.6 (%), Croatia (14.5%) and the Netherlands (14.7%);

- The age group "*from 54 to 64 years*" holds an average share of 15.1%. The highest shares belong to the following countries: Slovakia (25%), Belgium (21.5%), France (18.6%) and the UK (17.6%). The lowest shares belong to Malta (8.2%), Bulgaria (8.5%), Cyprus (8.9%) and Sweden (9.4%);

- The age group "*65 years and over*" has an average share of 15.4%. The highest shares belong to Sweden (25.2%), France (22.1%), the UK (17.9%) and Germany (17.1%), while the lowest shares are held by Slovakia (3.9%) and Bulgaria (4.4%).

The age groups of resident tourists were ranked in terms of the shares held at the level of the 29 analyzed European countries as follows:

- the age group "*from 45 to 54 years*" ranks first, with 18.9%;
- the age group "*from 35 to 44 years*" ranks second, with 17.7%;
- the age group "*from 25 to 34 years*" ranks third, with 16.3%;
- the age group "*65 years and over*" ranks fourth, with 15.4%;
- the age group "*from 55 to 64 years*" ranks fifth, with 15.1%;
- the age group "*from 15 to 24 years*" ranks sixth, with 14%;
- the age group "*less than 15 years*" ranks last, with 2.7% (having in view that, as already mentioned, only five countries reported the number of tourists from this age group).

It is noteworthy that the differences between the first six above-mentioned shares (held by the first six age groups) are not high. Moreover, regarding these shares, we noticed the tendency for a slight gradual increase in connection to the increase in the group age, i.e. from the age group 15-24 years (14 %), to the age group 25-34 years (16.3%), then to the age group 35-44 years (17.7%), up

to the age group 45-54 years, which holds the highest share (18,9%). Then, the shares begin to decrease and the age groups no longer have a logical succession in terms of age: the age group "65 years and over" (15,4%) is followed by the age group "55-64 years" (15,1%) and by the age group "15-24 years" (14%).

4. Conclusions

The shares from Table 2 shows that on average, in 2016, the domestic tourism of the 29 European countries under consideration had the following specific features:

-68% of the resident tourists who took domestic trips were active adults, typically families with children. In this category, entered the tourists aged 25-34 (16,3%), 35-44 (17,7%), 45-54 (18,9%) and 55 -65 years (15,1%).

-15,4% of the resident tourists who took domestic trips were older people, i.e. "65 years and over". In most cases, these were inactive people, with more free time, more willing to travel in order to maintain their health or even to solve some health problems.

-14% of the resident tourists were from the age group 15-24 years, represented by pupils, students, but also by employed/ active young people (with jobs). The latter allocated a certain share of their personal income for domestic trips.

-2,7% of the resident tourists were from the age group under 15 years. Some of them were school or preschool children, traveling with their family or companions.

Romania, with its 37,062 tourists who took domestic trips in 2016, is well behind the neighboring countries, i.e. Bulgaria (101,678 resident tourists, on the 24th place) and Hungary (1,571.118 resident tourists, ranking 15th). The very small number of Romanian resident tourists are influenced by numerous factors that certainly concern both the demand and the supply of the domestic tourist market.

Regarding Romania's tourist profile, as far as the age of resident tourists is concerned, the largest share belongs to the age group 25-34 years (10,797 tourists, i.e. 29,1% of the total number of tourists). It is followed by the age group 35-44 years (8,091 tourists, i.e. 21,8% respectively), then by the age group 45-54 years (6,281 tourists, i.e. 16,9%), the age group 15-24 years (4,862 tourists, i.e. 13,1%), the age group 55-64 years (4,777 tourists, i.e. 12,9%) and the segment of tourists aged over 65 years (2,254 tourists, i.e. 6,1%).

It is noteworthy that more than half (51%) of the total number of tourists is represented by the tourists from two age groups, i.e. 25-34 years (29,1%) and 35-44 years (by 21,8%). Together with the age groups 45-54 years (16,9%) and 55-64 years (12,9%), these tourists (who can be seen as the active population of the country) hold almost 81% of the total number of resident tourists. If we assume that the domestic trips are connected to the tourists' willingness to spend their weekends and legal free time (holidays, leave, vacations), then it is obvious that the tourists from these age groups are those more willing to travel in the country and represents the largest part of the domestic tourism demand. At the same time, they can be perceived as target groups by Romanian tourism operators.

Domestic tourism operators should be acquainted with the expectations of these tourists (from the above-mentioned age groups), in terms of tourist forms and destinations. This approach can help them prepare more attractive tourist offers, different from those advertised by competitors, in order to improve both the image (brand) and the economic performance.

The segment of tourists aged 65 and over has a very small share (6,1%) in the total number of resident tourists; moreover, this share is also small compared to the share held by this segment in other countries (only Bulgaria has a lower share, i.e. 4,4%).

The shares held by the tourists aged between 25 and 34 years and by those aged between 35 and 44 years are higher than the total averages. This shows that, in Romania, a larger number of young and adult tourists take domestic trips, compared to the European average. As far as the other age groups are concerned, the shares held by Romania are below the total average shares.

Out of the 29 analyzed countries, Romania ranks 27th, which shows a worrying situation regarding the size of the domestic tourist traffic, compared to the other European countries. Although in this study, we used only the "number of tourists" as an indicator for each country,

without comparing it with the total population number or to the area of the country, Romania's ranking should be the subject of more in-depth quantitative and qualitative research.

5. References

- Baltagi, B. H., 2008. *Econometrics*. New York: Springer.
- Benzecri, J. P., 1992. Correspondence Analysis Handbook. *Statistics: A Series of Textbooks and Monographs*. New-York: CRC Press.
- Everitt, B., Dunn, G., 2001. *Applied Multivariate Data Analysis*. London: Arnold.
- Field, A., 2009. *Discovering Statistics Using SPSS*. London: Sage Publications Ltd.
- Kachigan, S., 1982. *Multivariate statistical analysis*. London: Radius Press.
- Minciu, R., 2004. *Economia turismului*. [Tourism economics]. București :Editura URANUS
- Pintilescu, C., 2007. *Analiză statistică multivariate*. [Multivariate analysis]. Iași: Editura Universității Alexandru Ioan Cuza.
- Sank, O., Baron, P., Neacșu, N., 2001. *Economia turismului*. [Tourism economics]. București : Editura Expert.
- Spircu, L., 2005. *Analiza datelor-Aplicații economice* [Economic Data Analysis Applications]. București: Editura ASE.
- Spircu, L., Calciu, M., Spircu, T., 1994. *Analiza datelor de marketing* [Analyzing marketing]. București: Editura All.
- European Parliament, 2015. *European Parliament resolution of 29 October 2015 on new challenges and concepts for the promotion of tourism in Europe* [2014/2241(INI)] [online] Available at: <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2015-0391+0+DOC+XML+V0//EN>> [Accessed 26 January 2018].
- Eurostat, *Tourism statistics, Statistics Explained* [online] Available at: <http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_statistics> [Accessed 24 January 2018].
- United Nations and UNWTO, 2008. *International Recommendations for Tourism Statistics 2008*, Series M, No.83/ Rev.1. Madrid/New York [online] Available at: <<http://unstats.un.org/unsd/trade/IRTS/IRTS%202008%20unedited.pdf>> [Accessed 24 January 2018].