SPATIAL DISTRIBUTION OF CONSUMER PREFERENCES: CASE STUDY OF SHOPPING MALLS IN BRATISLAVA

František Križan

Department of Regional Geography, Protection and Planning of the Landscape, Faculty of Natural Sciences, Comenius University,Mlynská dolina, Ilkovičova 6, 842 15 Bratislava
krizan@fns.uniba.sk

Kristína Bilková

Institute of Geography, Slovak Academy of Sciences,Štefánikova 49, 814 73 Bratislava, Slovakia
kristina.bilkova@savba.sk

Peter Barlík

Market Locator SK s.r.o., 29. Augusta 36/A, 811 09 Bratislava
barlik@fns.uniba.sk

Pavol Kita

Department of Marketing, The Faculty of Commerce, University of Economics in Bratislava, Dolnozemská cesta 1, 852 35 Bratislava
pavol.kita@euba.sk

Peter Kita

Department of Management, Faculty of Business and Management, Brno University of Technology, Kolejní 2906/4, 612 00 Brno
kitap@fbm.vutbr.cz

Abstract
Process of globalization in post-communistic countries are mostly visible in changes in consumer behavior which lead to shopping centers becoming the preferred retail format. The development of shopping centers in Bratislava is progressively culminating. Although, the quantitative development isn't connected to quality in offerings. Hence, the consumers react with a varying level of preference in shopping centers. The aim of the paper is to evaluate consumer preferences (n=11,389) in shopping centers in Bratislava from a spatial distribution perspective. The results point at three types of spatial distribution of consumer preferences depending on the shopping center's location, on the one hand, and the shopping center's attractiveness on the other hand.
Keywords: Consumer preferences, shopping centers, Bratislava, concentric zones.

1. INTRODUCTION

Shopping centers have become part of the retail space in many post-communist countries due to globalization trends in the early 90s of the last century (Križan et al. 2016, Michalak 2001, Riley 1997, Spilková 2008, Szczyrba 2005a). The transformation of the retail space in Slovakia had several phases (Mitríková 2008, Trembošová 2012). As E. Nagy (2001, p. 346) states, taking Hungary as an example," in capitals and the largest provincial cities, large-scale developments have transformed consumer habits and the spatial shopping trips of the urban population, who have adapted very rapidly to the new retail structure. In this way, the gravity center of shopping has changed: customers increasingly target the city center for its specialized shops, but its role is declining in daily and weekly shopping. The flow of shoppers is also shifting from the traditional main shopping streets to new shopping centers and the stores clustered around it". As one of the few Slovak cities, Bratislava shows signs of growing decentralization and not only in suburbanization activities. On the one hand, Bratislava is a prime example of retail concentration (cf. Szczyrba 2005b), and retail activity decentralization on the other (Šveda, Križan 2012).

Changes in urban retail go along with changes in consumer behavior (Spilková 2012) and consumer mobility for services (Halás, Zuskáčová 2013). In this respect, shopping centers became the favored retail format (Maryáš et al. 2014, Szczyrba 2010).

The aim of the paper is to evaluate consumer preferences in shopping centers in Bratislava from a spatial perspective. The authors identify the most preferred shopping centers in Bratislava based on consumer preferences and attractiveness index. The authors also attempt to identify consumer preference distribution while choosing shopping centers.

2. METHODS AND DATA

The methods used in the study can be divided into three groups. The first group consists of methods analyzing consumer perceptions and preferences. Therefore, primary data was collected via survey and interviews (Guimarães 2014, Kunc et al. 2012). The study is based on a survey of 11,389 respondents, consumers shopping in retail units across Bratislava (cf. Bilková et al. 2016, Križan et al. 2015, Kita, Grossmanová 2014). Quota sampling was employed (Bryman 2012) to consider place of residence, age, and other characteristics (table 1). The survey was conducted between February and May 2011. Respondents were asked directly in shopping centers and their vicinities in Bratislava.

TABLE 1 - SELECTED CHARACTERISTICS OF RESPONDENTS PARTICIPATING IN THE SURVEY

Gender	Ratio [%]	Average age	Respondent education [%]				
			Without education	Primary education	Secondary education without certificate	Secondary education with certificate	University
Male	42.3	37.5	0.25	1.25	11.37	44.30	42.82
Female	57.7	36.3	0.15	1.22	10.17	49.55	38.91
Sum	100.0	36.8	0.19	1.23	10.68	47.33	40.57

Source: Own study. N= 11,389

The second group consists of methods evaluating shopping center attractiveness. The corresponding literature states numerous options to measure attractiveness in the form of various indexes (cf. Kunc et al. 2016, Mitríková and Antolíková 2016). The study employs an attractiveness index (Des Rosiers et al. 2005) quantifying shopping center attractiveness as a ratio comparing individual shopping centers to the sum of shopping centers in Bratislava (cf. Križan et al. 2016).

Visualization and interpretation methods compose the third group of methods. Geographic information systems (GIS) were employed not only as a cartographic (visualization) tool but also an analytical (interpretation) study tool. The analysis in the GIS comprised of several steps:

I.   Raster digitalization and layer creation. Shopping center localization data was geocoded with GIS editing tools.

II.   Analysis of shopping center accessibility. Shopping center accessibility was analyzed using binary accessibility ratios in the road network within the GIS with the Network analyst tool (cf. Ďurček and Horňák 2016). Starting points in the square grid are represented by 1 x 1 km centroids. Ending points are represented by shopping center locations in Bratislava in 2011 or 2016.

III.   Interpretation of cartographic analysis results. Analytical parts of the study were visualized within the GIS using several cartographic techniques.

The applied data can be divided into two groups. The first group consists of the collected data. Primary data connected to each shopping center, retail unit structure, and service facilities. The second group is composed of secondary data provided by the Slovak statistical office. The data is a raster of the Slovak republic. The city of Bratislava is covered by a grid of 436 1x1 km squares, 230 of which (52,8%) are unpopulated and 25 have a population of less than 10 residents. This points to the heterogeneous distribution of residents and confirms the suitability of applying a grid system for analysis. The average density of population within the grid is 946 residents/km2. 199 out 206 squares were analyzed. Geocoding was a limiting factor due to overlap of the grid and the existing road network. In total, 7

squares (or rather centroids) had a marginal location and which had no influence on the analysis results. The primary data containing consumer preferences were later paired with the grid and analyzed per 1x1 km squares.

3. SHOPPING CENTER CONSUMER PREFERENCES IN SPACE

Bratislava as the capital disposes of a wide range of retail units (Kita and Grossmanová 2014, Kita et al. 2014, Križan et al. 2014). The authors' attention was centered around the 7 most preferred shopping centers (figure 1) which attained the highest attractiveness index (table 2) at time of study. This is due to the complex nature of Bratislava's retail system. The shopping centers in question are of different character in terms of genesis (greenfield vs. brownfield) and location (city center vs. suburbs) (cf. Križan et al. 2017).
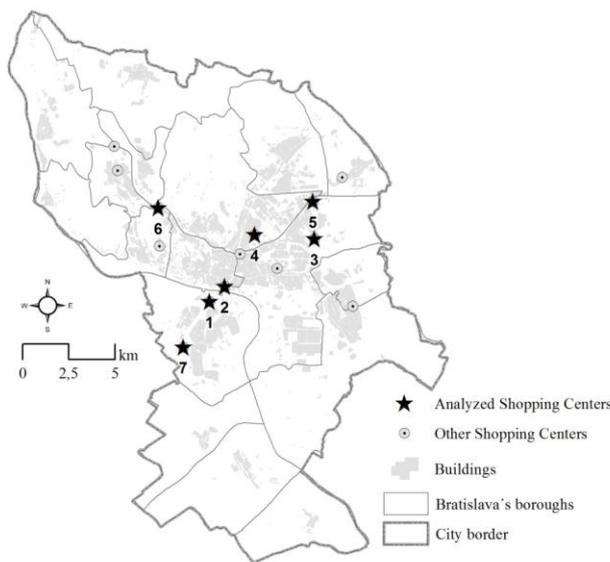

FIGURE 1 - SHOPPING CENTERS IN BRATISLAVA

TABLE 2 - THE MOST VISITED SHOPPING CENTERS IN BRATISLAVA IN 2011

Shopping center	R (%)	CAI (%)
1. Aupark	24.3	17.75
2. Galéria Eurovea	17.0	18.84
3. Avion Shopping Park	15.6	9.72
4. Polus Shopping Center	10.8	15.55
5. Shopping Palace Zlaté Piesky	3.2	2.09
6. OC Galéria	3.2	1.57
7. OC Danubia	2.5	5.68
Other shopping centers and shopping malls	22.3	28.8
Uncathegorized answers	1.1	-

R – Ratio of preferring respondents, CAI – Center attraction index.

Source: Križan et al. (2015, 2016).

While evaluating consumer preferences, results shown very low consumer loyalty but significant heterogeneity in preferences for individual shopping centers as the most frequent shopping places. 56,9% of consumers in Bratislava prefer the three most visited shopping centers (Aupark, Galéria Eurovea a Avion Shopping Park). The most preferred is Aupark (Križan et al. 2015), a shopping center located on the city center's edge within the largest residential area on the south of the city (over 100,000 residents). A significant change in this city district happened after the transition to a market economy. Despite the presence of another shopping center (OC Danubia), Aupark's attractiveness exceeds the borders of the city district of Petržalka. Aupark is also preferred by consumers from marginal city districts. It is the most preferred shopping center mostly in the district of Petržalka, this is confirmed by attractiveness index values (figure 2). There is only one shopping center (Galéria Eurovea) located in the historical city district (Križan et al. 2017). Due to its location, it is preferred by residents of every city district commuting daily to service providers in the city center. These preferences are relatively even in distribution, although slightly diminishing with increasing distance from the center. Despite its marginal location, Avion shopping park retains a significant part of consumer preferences and is one of the most preferred shopping centers in the city. Its attractiveness index attains high values in its vicinity, based on the gross rented surface area, number of residents, and distance. This is due to shopping center's location, away from main public transport lines (Sikos 2011). It is the largest shopping center in Slovakia (GLA = 103,000 m2). An important part contributing to its attractiveness is the presence of an IKEA outlet (Kunc et al. 2016).
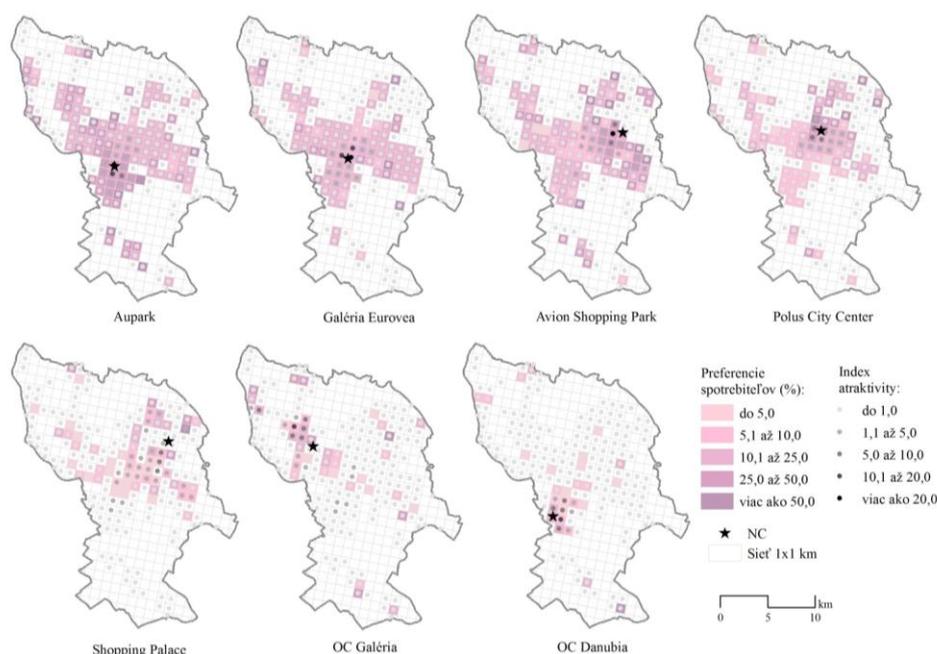

FIGURE 2 - CONSUMER SHOPPING CENTER PREFERENCE SPATIAL DISTRIBUTION, IN THE CONTEXT OF SHOPPING CENTER ATTRACTIVENESS

Polus City Center, opened in 2000, is the oldest shopping center in Slovakia. Its attractiveness index peaks in its background, preferred mostly by consumers mostly from neighboring districts. The reason is the development of new shopping centers in other districts and the inability to discern trends in consumer identity changes. Its attractiveness was diminished by the closure of one of its magnets – a Carrefour hypermarket outlet. A more noticeable downfall in attractiveness is visible in the case of Shopping Palace, located in the industrial area on the city's edge (fig 2). The shopping center is preferred by employees living in other districts and consumers commuting to Bratislava. Due to the establishment of other competing centers, developers had to hold back on their plans to enlarge the shopping center. Three other competing centers are closely located to Shopping Palace which limits the attractiveness of this marginal shopping center. Regarding the attractiveness index as well as consumer preferences, OC Galéria and OC Danubia can be considered as shopping centers of local importance which do not significantly exceed the border of their districts. Their location on the city's outskirts and presence of more attractive shopping centers explain the lower consumer preferences (Bilková et al. 2016).

The analysis of the spatial distribution of preferences in shopping centers divides the studied shopping centers into three groups (fig 3). Group A, composed of shopping centers with a significant preference diminishing over distance, although after reaching a certain point a collective increase is noticeable. These are shopping centers located away from the city center and consumers have to commute from far away, e.g. Aupark, Avion Shopping Park. Group B is also composed of shopping centers with a significant preference, though, the fall off over distance is slower than in Group A. The locations are concentric to the daily economic activities of their consumers within the city center. This renders the preferences relatively stable throughout space, e.g. Galéria Eurovea. Group C's preference increases over distance. The trendline can have different character (linear or exponential) depending on the shopping center's features, e.g. Polus City Center and Shopping Palace.
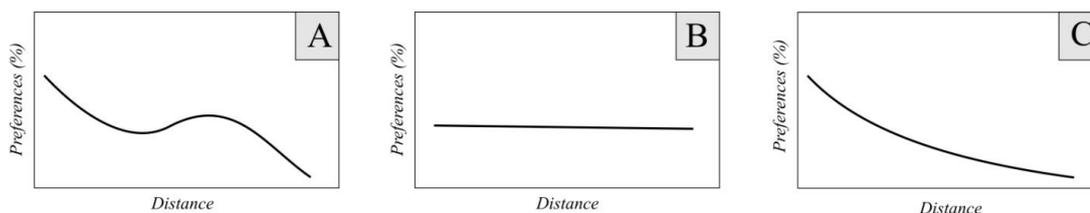

FIGURE 3 - TYPES OF SPATIAL DISTRIBUTIONS OF SHOPPING CENTER PREFERENCES IN BRATISLAVA.

4. CONCLUSIONS AND DISCUSSIONS

Consumers preferences and shopping center attractiveness can be discussed on various levels (cf. Kunc et al. 2016). From this perspective, Bratislava's shopping centers can be divided into three groups. The first group composes of shopping center with extra-regional importance, although it does not seem to explicitly be the case. This empirical study and the study of J. Kunc et al. (2016) puts Aupark, Galéria Eurovea, and Avion shopping park into the first group. The second group represents shopping centers of citywide importance (Polus City center and Shopping Palace). The third group encompasses shopping centers of local importance (OC Galéria and OC Danubia) whose elevated preferences (and attractiveness index) manifest themselves in their proper city districts. Three types of customer preference spatial distribution were identified in the article. They differ depending on the shopping center's location, on the one hand, and shopping center attractiveness, on the other hand. In this respect, it is necessary to state that the results correspond to one city. Hence, they cannot be generalized. The authors acknowledge this fact and consider it a limiting factor of the study. The results can be used in planning, in the sense of sales marketing or geomarketing in general. A customer preference spatial distribution analysis is an important benefit for planners and marketers in the competitive retail environment. Retailers can modify their commercial strategies to better match customer behavior and lead to commercial success. Regarding planned development activities, shopping center enhancement, and other construction plans, local government regulation is becoming an issue (cf. Guimarães 2016, Maksić 2014, Smolová and Szczyrba 2000, Spilková 2010), due the construction of new shopping centers influencing consumer behavior, consumption equations in the urban space (Guimarães 2014), as well as consumers residing in the countryside (Heffner and Twardzik 2015, Sikos and Kovács 2008). This leads to the architectural character and urbanism of the city and should be treated as assets. Thus, as beneficial to the planning process (Gibbs 2012). Combined with proven retailing principles, they can create a sustainable urban shopping district, one capable of providing the goods and services needed and preferred by consumers.

ACKNOWLEDGEMENT

REFERENCES

Bilková, K., Križan, F., Barlík, P. (2016). Consumers preferences of shopping centers in Bratislava (Slovakia). *Human Geographies - Journal of Studies and Research in Human Geography*, 10, 1, 23-37.

Bryman, A. (2012). Social research methods. New York (Oxford university press).

Des Rosiers, F., Thériault, M., Mémétrier, L. (2005). Spatial Versus Non-Spatial Determinants of Shopping Center Rents: Modeling Location and Neighborhood-Related Factors. *Journal of Real Estate Research,* 27, 293-319.

Ďurček, P., Horňák, M. (2016). Population potential within the urban environment and intra-urban railway network opportunities in Bratislava (Slovakia). *Moravian Geographical Reports,* 24, 4, 52–64.

Gibbs, R. J. (2012). *Principles of urban retail planning and development*. Hoboken (John Wiley & Sons).

Guimarães, P.P. (2014). The prospective impact of new shopping centres on the retail structure of Braga. *Bulletin of Geography. Socio-economic Series*, 25, 25, 167-180.

Guimarães, P.P. (2016). Controlling Retail Development between Restrictiveness and Innovation. Insights from Portugal. *Journal of Settlements and Spatial Planning*, 7, 1, 35-43.

Halás, M., Zuskáčová, V. (2013). Travelling to services in the daily urban system of Olomouc. *Bulletin of Geography. Socio-economic Series*, 20, 20, 23-41.

Heffner, K., Twardzik, M. (2015). The impact of shopping centers in rural areas and small towns in the outer metropolitan zone (the example of the Silesian Voivodeship). *European Countryside*, 7, 2, 87-100.

Kita, J., Kita, P., & Grossmenova, M. (2014). Present retail network of Bratislava and some tendencies in consumers' purchasing behaviour. *Handel Wewnętrzny*, 3, 54-65.

Kita, P., & Grossmanová, M. (2014). Reflection of Bratislava retail network in selected aspects of consumer behaviour. *Business: Theory and Practice/Verslas: Teorija ir Praktika*, 15, 3, 279-284.

Križan, F., Bilková, K., & Kita, P. (2014). Urban retail market in Bratislava (Slovakia): Consumers perception and classification of shopping centres. *Management & Marketing*, 9, 4, 483-500.

Križan, F., Bilková, K., Kita, P., Siviček, T. (2016). Transformation of retailing in post-communist Slovakia in the context of globalization. *E & M: Ekonomie a Management*, 19, 1, 148-164.

Križan, F., Kunc, J., Bilková, K., Barlík, P., Šilhan, Z. (2017). Development and classification of shopping centers in Czech and Slovak republics: comparative analysis. *Acta Universitatis Carolinae Geographica,* (in press).

Križan, F., Paško, M., Bilková, K., Barlík, P., Kita, P. (2016). Heterogeneity of shopping centers' attractiveness in Bratislava. *Geographia Technica*, 11, 2, 61-68.

Kunc, J., Frantal, B., Tonev, P., Szczyrba, Z. (2012). Spatial patterns of daily and non-daily commuting for retail shopping: The case of the Brno City, Czech Republic. *Moravian geographical reports,* 20, 4, 39-54.

Kunc, J., Križan, F., Bilková, K., Barlík, P., Maryáš, J. (2016). Are there differences in the attractiveness of shopping centres? Experiences from the Czech and Slovak Republics. *Moriavian Geographical Reports*, 24, 1, 27-41.

Maksić, M. (2014). The Neo-Institutional Framework of Large-Scale Retail Spatial Policy Formulation Processin Serbia. *Transylvanian Review of Administrative Sciences*, 10, 90-110.

Maryáš, J., Kunc, J., Tonev, P., Szczyrba, Z. (2014). Shopping and Services Related Travel in the Hinterland of Brno: Changes From the Socialist Period to the Present. *Moravian Geographical Reports*, 22, 3, 18-28.

Michalak, W. (2001). Retail in Poland: An assessment of changing market and foreign investment conditions. *Canadian Journal of Regional Science*, 24, 3, 485-504.

Mitríková, J. (2008). *Geografické aspekty transformácie maloobchodu a nákupného správania sa na Slovensku (prípadové štúdie z miest Prešov a Košice).* Prešov (Prešovská univerzita v Prešove).

Mitríková, J., Antoliková, S. (2016). Calculation of shopping probability by the Huff model in selected retail stores of Kosice (Slovak Republic). *Економічний часопис-XXI*, 159, 5-6, 63-66.

Nagy, E. (2001). Winners and losers in the transformation of city centre retailing in East Central Europe. *European Urban and Regional Studies*, 8, 4, 340-348.

Riley, R. (1997). Retail change in post-communist Poland. *Geography*, 82, 1, 27-37.

Sikos, T. (2011). Competition between Aupark Shoppping Center and Avion Shopping Park. Romanian Review of Regional Studies, 7, 2, 79-90.

Sikos, T., Kovács, A. (2008). The development of retail trade sector in South-Slovakia. In Fojtik, J. (Ed.). *International Innovation Conference for Co-operation Development (InCoDe)* (pp. 177-191), Pécs (Faculty of Business and Economics at University of Pécs).

Smolová, I., Szczyrba, Z. (2000). Large commercial centers in the Czech Republic–landscape and regionally aspects of development (contribution to the study of the problematic). *Acta Universitatis Palackianae Olomucensis Facultas Rerum Naturalium, Geographica*, 36, 81-87.

Spilková, J. (2008). Changing face of the Czech retailing in post-communist transformation: Risks of extreme polarisation under globalisation pressures. In Dostál, P. (Ed.). *Evolution of geographical systems and risk processes in the global context.* (pp. 157-171), Prague (P3K).

Spilková, J. (2010). Retail Development and Impact Assessment in Czech Republic: Which Tools to Use?. *European Planning Studies*, 18, 9, 1469-1484.

Spilkova, J. (2012). The birth of the Czech mall enthusiast: the transition of shopping habits from utilitarian to leisure shopping. *Geografie*, 117, 1, 21-32.

Szczyrba, Z. (2005a). *Maloobchod v ČR po roce 1989: Vývoj a trendy se zaměřením na geografickou organizaci.* Olomouc (Univerzita Palackého).

Szczyrba, Z. (2005b). Územní rozvoj obchodní sítí v Česku a na Slovensku. *Acta Facultatis Rerum Naturalium Universitatis Comenianae, Geographica Supplementum,* 3, 574-580.

Szczyrba, Z. (2010). Development of retail geographical structure in the Czech Republic: a contribution to the study of urban environment changes. *Acta Universitatis Palackianae Olomucensis–Geographica*, 41, 2, 5-20.

Šuška, P., Stasíková, L. (2013). Transformation of the built environment in Petržalka pre-fabricated housing estate. *Hungarian Geographical Bulletin*, 62, 1, 83-89.

Šveda, M., Križan, F. (2012). Prejavy komerčnej suburbanizácie vo vybraných odvetviach hospodárstva v zázemí Bratislavy. *Ekonomický časopis*, 60, 5, 460-481.

Trembošová, M. (2012). *Geografické aspekty maloobchodnej siete mesta Nitra.* Nitra (Univerzita Konštantína Filozofa).