

Improving the placement of food products of organic origin on the AP Vojvodina market

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Abstract

The aim of this paper is to define suggestions and guidelines for improving the placement of food products of organic origin in the AP Vojvodina market. The main task is to identify and analyse indicators that the final consumers consider most important when purchasing food products of organic origin. The data was collected by field and electronic studies on a sample of 500 final consumers about their expectations, attitudes and habits in the purchase and consumption of organic food. Descriptive statistics was used for data processing, while multiple regression analysis was used to interpret results and test the established hypotheses. The results showed the existence of statistically significant correlations between different indicators, such as: quality label, origin of the product, composition of raw materials, freshness, price, taste, place of sale and packaging and consumers' decision to purchase an organic food product. The results of the research will serve as a basis for the creation of a regression model for the successful placement of food products of organic origin in the AP Vojvodina market. The practical significance of the research is reflected in the fact that it will indicate to the supply chain managers the indicators that need to be optimized to ensure more efficient placement of organic products on the national market. Suggestions and recommendations for future research are provided in the paper.

Keywords

Food products of organic origin, quality, consumer's expectations, product origin, supply chains.

Introduction

In previous studies, the authors point to an increasing share of organic food products in the consumer basket, which in the EU market ranges from 4.5% in the UK to 14% in Denmark (Wier, Jensen, Andersen, & Millock, 2008). Changes are also evident in the advertising activities, where an increasing significance on the global market is attributed to organic products. According to the results of a global study conducted in 2016, which included an analysis of 128 world journals, out of 579 advertisements published in these journals, 178 or 31% of them referred to organic food

products (Gebhardt & Heinz, 2018). Data show that world demand for organic food products grows at an annual rate of 20%, while it is estimated that the retail sales of such products annually exceed \$ 100 billion (US\$), with the trend that 93% of global consumers expect placement of exclusively those products that are produced according to the highest ecological standards (Arsi, Donoghue, Venkitanarayanan, & Donoghue, 2019; Hjelmar, 2011). In line with this trend in the global market, consumers' expectations are growing (Popescu, 2018) as well, and therefore they consider organic food products to be better in taste, more natural, healthier and safer than conventional alternatives

for consumers and the environment (Kataria, Krishna, Tyagi, & Vashishat, 2019).

Unlike in developed countries, insufficient attention is paid to organic production, placement and consumption in our market. The data show that in the Republic of Serbia the share of organic land in the total land is only 0.44% or 15,000 ha with a total of 2,000 agricultural producers and processors (Gulan, 2017). Compared to EU countries where the placement of organic food products grows at an annual rate of 10-15% (Martić Kuran & Mihić, 2014), this growth rate in Serbia is estimated at only 2 to 3% (Končar et al, 2018).

However, the key provisions of *Serbia 2020 - the Concept of Development of the Republic of Serbia until 2020* anticipate a significant redesign of the role of traditional food products of organic origin as a holder of rural development and the overall economic potential of the Republic of Serbia (Stojanović & Ognjanov, 2012). In this context, this implies directing state subsidies to improving the placement of organic products, financial support for the development of organic production, allocation of tax incentives for organic producers, control and certification of organic food, etc. In addition, certainly the most important factor is the views of local consumers about their readiness to dominantly buy food products of organic origin (Grubor & Đokić, 2015).

Bearing in mind the mentioned aspects, *the subject of this paper* is the research of consumers' expectations of organic products on the market of AP Vojvodina. *The aim of the paper* is to define the significance of the indicators that final consumers consider most important when purchasing food products of organic origin. The obtained *results of the research* will serve as the basis for the creation of a regression model with proposals and guidelines for improvement of the placement of food products of organic origin on the market of AP Vojvodina.

The paper consists of the following sections. The introduction is followed by the *Theoretical background of the research* that pointed to the importance of supplying organic products and defined indicators that influence the placement of food products of organic origin. Based on the literature review, basic research hypotheses are established. The method, sample and variables of the research are presented in the chapter *Methodology*. The next chapter - *Results*, presents the results of the tests carried out. The chapter - *Discussion*, defines the regression model, summarizes the most important results of the

conducted research and provides the guidelines for the improvement of the placement of food products of organic origin. The last chapter brings together proposals and guidelines for future research and points to the observed shortcomings of the conducted research.

1. Theoretical background and research hypothesis

Organic food products represent a significant segment of the entire supply chain. Research in the global market (Batte, Hooker, Haab, & Beaverson, 2007) shows that organic products must first be clearly differentiated into: 100% organic products, organic products (at least 95% organic), products produced with organic ingredients (at least 70%) and products with some organic ingredients (contain up to 70% of organic substances). Only the first three categories can use the word organic in their name. These are products obtained through a system of organic farming and production, without the use of chemicals, pesticides, additives, emulsifiers, artificial constituents, raw materials and fertilizers (Charter, 2001).

Consumers attach greater importance to these products especially in the food segment. The results of numerous studies confirm that the growth rate of organic foodstuffs by far exceeds the overall growth rate of the food market. In the period from 2002 to 2011, the overall growth rate of the food market was 33% compared to 238% of the growth rate of food products of organic origin (Koklic, Golob, Podnar, & Zabkar, 2019). Consumers consider fruits and vegetables, milk and dairy products and cereals as the most important organic products, while the organic meat market has seen the highest trend of growth in recent years (Nguyen, Nguyen, Nguyen, Lobo, & Vu, 2019).

Retail chains dominate in the placement of organic food products in the EU market by achieving 16-25% (Malta, Poland, Spain, Italy) up to 80-90% (Romania, Bulgaria, Denmark, Finland, Norway) when it comes to the sales of organic food (Brčić-Stipčević, Petljak, & Guszak, 2011). As a result of such developments, final consumers show a tendency towards proven safety, quality, composition and origin of food products. Research on the global market confirms the direct correlation between consumer safety in the quality and composition of organic products and the efficiency of placements (Wong & Tzeng, 2019; Končar, Marić, & Vukmirović, 2018; Truong, Yap, & Ineson, 2012).

In the global market, the most important indicators that influence the consumption of organic products are the health of consumers and producers (Truong et al, 2012), ecological reasons (Pearson, Henryks, Sultan, & Anisimova, 2013), sustainability (Jurjević, Bogičević, Đokić, & Matkovski, 2019), safety (Truong et al, 2012), ethical motives (Honkanen, Verplanken, & Olsen, 2006), cognitive quality knowledge (Sponte, 2018), etc. Similarly to these results, on the local market, and especially in the AP Vojvodina market, the conducted studies pointed to the following indicators that consumers value as crucial in the selection and purchase of food products of organic origin. The following is emphasized: geographical origin labels (Stojanović & Ognjanov, 2012), quality labels (Končar, Grubor, Marić, Vukmirović, & Đokić, 2019), trust in composition and quality (Grubor & Đokić, 2015), health safety (Prodanović, Kuzman, Jovović, & Ozegović, 2017; Vlahović, Puškarić, & Jeločnik, 2011), taste (Vehapi, 2015), brand (Kocić, Marinković, & Alimpic, 2016), etc. The most common reasons that discourage consumers from purchasing organic products in our market are as follows: price (30%), distrust in quality labels (22), poor supply (21%), unavailability (20%), etc. (Vehapi, 2015).

End-users show increasing interest in all aspects of quality, safety and trust in organic food ingredients. If the participants in the supply chain, i.e. the producers (processors), farmers and trade companies are trying to improve the placement of these products, the supply chain management needs to focus in particular on the following indicators: quality label, product origin, composition of raw materials, freshness, price, taste, place of sale and packaging.

Quality label refers to the certification and standardization of organic products. It is crucial to determine if and to what extent consumers pay attention and trust these labels in our market.

Product origin relates to the geographical origin, i.e. place of food production, whether it is domestic or foreign producers and whether the origin affects the differences in the expectations of the final consumers.

Composition of raw materials includes the content of pure organic substances of a food product without additives such as emulsifiers (E102, E103, E104, etc.), GMOs, additives, pesticides, chemicals, artificial colours, etc.

Freshness, as a product quality indicator, is a characteristic of the product's durability, indicates

some changes in deterioration (meat and meat products) or rotting of the product (fruits, vegetables), indicates the presence of foreign matter in a product, damage to the packaging, etc.

Price, as a placement indicator implies the price at which food products are placed in retail facilities. It is usually 30% higher than the price of conventional food products, as a consequence of: small amount of placement, expensive technology, complex and costly certification procedure, expensive packaging, etc.

Taste can be a significant motive for the purchase of food products of organic origin. As an indicator, taste is especially pronounced in fruits, vegetables, meat and meat products, bread and pastry, where consumers consider organic foods more tasty than conventional food products (Kihlberg & Risvik, 2007).

Place of sale refers to the question of whether a place (selling facility) where a product is purchased can be a predictor of quality and consumers' certainty in the organic composition of food products. These can be: retail facilities, green markets, or purchasing organic food directly from a manufacturer (processor).

Packaging relates to the improvement of the ecological status of packaging. For organic product groups, this implies a good knowledge of their functional characteristics and the ecological status of packaging materials and waste, which means that the packaging must be made of environmentally friendly raw materials and biodegradable or recyclable materials, using renewable resources and energy sources.

The subject of the research set up in this way is operationalized through the following eight research hypotheses:

H₁ – Quality label is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₂ – Product origin is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₃ – Composition of raw materials is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₄ – Freshness is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₅ – Price is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₆ – Taste is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₇ – Place of sale is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

H₈ – Packaging is an indicator that has a statistically significant impact on consumers' decision when purchasing food products of organic origin.

The most important results of the research, comments related to testing of hypotheses and suggestions for improving the placement of food products of organic origin are presented below.

2. Methodology

2.1. Variables

The study included several variables for confirming or rejecting these hypotheses. These are: independent variable of interval type of measurement and dependent variable. The independent variable of the interval type of measurement includes the assessment (ranking) of the significance of each of the offered indicators to the final consumers' expectation when selecting and purchasing organic food. The individual contribution of each indicator is ranked on the basis of the Likert scale (1-5 ranks). The dependent variable is the expectation, i.e. consumers' decision on the selection and purchase of food products of organic origin, i.e. to what extent indicators, such as: quality label, product origin, composition of raw materials, freshness, price, taste, place of sale and packaging meet their expectations and affect the decision to purchase food products of organic origin.

2.2. Research sample

The research was carried out on a sample of 500 final consumers from the territory of AP Vojvodina. The obtained data are the result of the research within the short-term projects of special interest for sustainable development in AP Vojvodina in 2018, based on a research project: "Study on the sustainability of domestic manufacturers and trading companies in the placement of food and organic products in the AP Vojvodina market". The study was carried out in the period September 2018 - April 2019. The

sample was dominated by female consumers (m=172 or 34.4%; f=328 or 65.6%), due to their greater willingness to participate in the research. The highest share of respondents in the sample had higher education (n=295 or 59%). However, the sample is uniform in terms of respondents' age, place of residence (urban/rural) and household income.

In order to determine the reliability and validity of the used measurement scales for each of the tested indicators, the Cronbach Alpha coefficient was used (Table 1).

Table 1 Values of Cronbach's coefficient alpha for scale reliability

Indicators	Cronbach's alpha
Quality label	.742
Product origin	.873
Composition of raw materials	.901
Freshness	.718
Price	.866
Taste	.849
Place of sale	.773
Packaging	.842
For all items	.897

Source: The Authors

The value of the alpha coefficient, which for all indicators is closer to 1 than 0, indicates that the applied scales have an excellent level of reliability, i.e. they are valid for measuring the attitudes and opinions of final consumers.

2.3. Research procedure

The research was carried out by field studies and electronically via an e-questionnaire that was sent to final consumers from the base of trading companies. The average filling time of the questionnaire was from 10 to 15 minutes. Questionnaires were sent to final consumers until there were 500 successfully completed questionnaires. A total of 643 questionnaires were distributed (response rate, n=77.76%).

The data were sorted and processed with the SPSS 20 statistical package. Respondents' answers were interpreted and analysed through descriptive statistics. Average values, as well as deviations for each indicator, are presented. Correlation between the indicators is determined by the Correlation matrix, while the accuracy of the set hypotheses is tested based on multiple regression analysis.

3. Results

The following table (Table 2) shows the average ranking of each of these indicators, i.e. the degree of agreement of the final consumers with the assertion that the analysed indicators significantly influence their decision to purchase food products of organic origin.

Table 2 Results of individual indicator ranking

No.	Indicators	Significance rank
1	Quality label	4.32
2	Product origin	3.94
3	Composition of raw materials	4.22
4	Freshness	3.14
5	Price	4.12
6	Taste	2.85
7	Place of purchase	3.71
8	Packaging	2.68
9	For all items	4.08

Source: The Authors

The attached table shows that final consumers’ decision to purchase organic food products in the AP Vojvodina market is most significantly affected by the indicator of quality label and composition of raw materials. Somewhat less significance respondents attach to price, product origin and place of sale, while the lowest degree of agreement is indicated for the indicators: freshness, taste and packaging of organic food. In addition to these descriptive indicators, the following table (Table 3) presents descriptive statistics by individual indicators.

Table 3 Descriptive statistics for the analysed indicators

Indicators	Min.	Max.	Mean	St. deviation
Quality label	2.33	5.00	4.3280	1.17874
Product origin	1.67	4.67	3.9492	.85697
Composition of raw materials	2.67	4.67	4.2203	.97461
Freshness	1.33	4.00	3.1499	1.24192
Price	1.00	4.67	4.1202	1.17582
Taste	1.00	3.97	2.8598	.84652
Place of sale	1.33	4.33	3.7114	1.01472
Packaging	1.67	3.67	2.6806	.49521

Source: The Authors

Quality label indicator (M=4.32; SD=1.18) implies that final consumers in the domicile market pay attention to quality certification and standardization that is incorporated in certified quality labels clearly displayed on the packaging or the food product itself. Quality labels can be national (e.g. *Best from Vojvodina*, *Organic product*, etc.) or international/EU labels (e.g. *Eco-label*, *Mobius strip*, *Forest Stewardship Council – FSC label*, etc.).

An equally important indicator is Composition of raw materials (M=4.22; SD=0.97). This implies that final consumers read declarations on products, composition of organic raw materials, identify emulsifiers, sweeteners, artificial additives and colours as being harmful to health, non-safe substances. The next indicator that consumers notice is the price (M=4.12; SD=1.18). However, what is specific for this indicator is the fact that consumers show a high degree of agreement that prices of organic products are significantly higher than products from conventional processing. A somewhat less significance is attributed to product origin (M=3.94; SD=0.86) and place of sale (M=3.71; SD=1.01). This result implies that consumers, if they receive a quality and safe organic product, do not find it important whether the product is of national or international origin, or whether they buy it in a retail facility, markets, or directly from producers. The middle ranking of impact is attributed to Freshness of product (M=3.15; SD=1.24) as a consequence of the fact that modern technology in the form of intelligent packaging indicates to consumers any change in the composition and texture of the product and thus timely warn them and affect their decision to purchase. Finally, organic food is the least selected for taste (M=2.86; SD=0.85) and packaging and design (M=2.68; SD=0.49). Some studies find that it takes time for consumers to adapt to the taste of organic products, because it is more intensive for non-organic alternatives due to artificial flavours and additives (Truong et al, 2012; Kihlberg & Risvik, 2007). When it comes to packaging, the problem in our market is the lack of modern packaging and its simple design, solely as a result of the fact that the investments in these promotional instruments would additionally raise the price of organic products.

Correlation matrix is applied in order to determine how the indicators interact with one another, i.e. which sets of indicators have the similar coefficients (Table 4).

Table 4 Correlation matrix for analysed indicators

Indicators	Quality label	Product origin	Composition of raw materials	Freshness	Price	Taste	Place of sale	Packaging
Quality label	1							
Product origin	.753**	1						
Composition of raw materials	.873**	.908**	1					
Freshness	.561**	.571**	.849**	1				
Price	-.247**	-.702**	-.495**	.388**	1			
Taste	.415	.323	.267	.258	.316	1		
Place of sale	.471**	.894**	.316**	.461**	.656**	.406	1	
Packaging	.138	.735	.401	.443	.567	.373	.482	1

** Correlation is significant at the level 0,01

Source: The Authors

In the given matrix, we note that the greatest deviations, i.e. the largest number of statistically significant differences, are indicated by indicators of Quality label, Composition of raw materials and Product origin. Observed individually in relation to each other, the highest coefficient of correlation is marked with Quality label and Composition of raw materials ($r=0.873$), Product origin and Composition of raw materials ($r=0.908$) and Composition of raw materials and Freshness ($r=0.849$). This means that if consumers are satisfied with the quality label, composition of raw materials and product origin, they will probably choose to buy that organic product. There is also a significant correlation between price indicators and other variables, however, with a negative sign. Deviations are not recorded for indicators Taste and Packaging.

In order to test hypotheses and to examine the influence and correlation of the indicated group of indicators on the decision to purchase food products of organic origin, a multiple regression analysis was applied. The Enter method, which includes all independent variables to predict the dependent variable, has shown that the regression model is statistically significant ($F(500;7) = 2.68$, $p < 0.001$). In other words, a set of tested indicators statistically significantly predicts the decision to purchase of organic food in the AP Vojvodina market. It describes 67.8% of the variance of the criteria. In addition to the overall contribution of the set of indicators, the contribution of individual indicators was also examined (Table 5).

Table 5 Individual contribution of the indicator to the explanation of the dependent variable

Model	Standardized coefficient		t	Sig.
	Beta	St. error		
(constant)	1.22	1.472	2.476	.000
Quality label	.422**	.252	.306	.000
Product origin	.212**	.587	1.001	.000
Composition of raw materials	.747**	.172	.388	.001
Freshness	-.091*	.591	1.282	.003
Price	-.726**	.450	.060	.000
Taste	.202	.698	1.362	.057
Place of sale	.573*	.281	.295	.003
Packaging	.181	.583	.842	.124

** Significant at the level 0,01

* Significant at the level 0,05

Source: The Authors

Based on the presented data, it is noticeable that the decision to purchase food products of organic origin is statistically significantly predicted by Quality labels ($B=0.422$), Composition of raw materials ($B=0.747$) and Product origin (0.212), while contribution of Price is also statistically significant but in a negative direction ($B=-0.726$). This analysis has confirmed research hypotheses **H₁**, **H₂**, **H₃** and **H₅** which means that any change in these indicators statistically significantly affects consumers' decision on the selection and purchase of food products of organic origin on the market of AP Vojvodina. This correlation is positive in the case of Quality label, Product origin and Composition of raw materials, i.e. with a significant increase in the impact of these indicators, consumers are more determined to buy organic products, while the negative sign in Price means that the volume of organic food sales decreases with its growth. This result coincides with the results of related studies (Vehapi, 2015). Research hypotheses **H₄** and **H₇** are on the border of statistical significance, i.e. Freshness ($B=-0.091$)

and Place of sale ($B=0.573$) moderately affect the selection of food products of organic origin. Remaining research hypotheses H_6 and H_8 are not accepted because the indicators Taste ($B=0.202$) and Packaging ($B=0.181$) did not make a statistically significant contribution.

4. Discussion

The obtained results and the conducted tests indicate that final consumers from the AP Vojvodina market show a different level of interest in certain indicators when they make a decision on the purchase of organic products. They express a clear need for Quality label to be transparently emphasized, to check Composition of raw materials and Product origin, while they adversely react to high prices by withdrawing from purchase. In this context, based on the statistical significance in the previous table, it is possible to present the regression model (equation), which points to the individual significance of the analysed indicators on the placement of food products of organic origin on the market of AP Vojvodina (1).

$$y = 1.22 + 0.422x_1 + 0.212x_2 + 0.747x_3 - 0.091x_4 - 0.726x_5 + 0.573x_6$$

In the given equation, y represents the placement of food products of organic origin, while x marks independent indicators, such as: x_1 - quality label, x_2 - product origin, x_3 - composition of raw materials, x_4 - freshness, x_5 - price and x_6 - place of sale. Indicators that do not have a statistically significant contribution are not included in the regression model.

A defined regression model, for the purpose of a clearer interpretation, can be graphically presented in the following way.

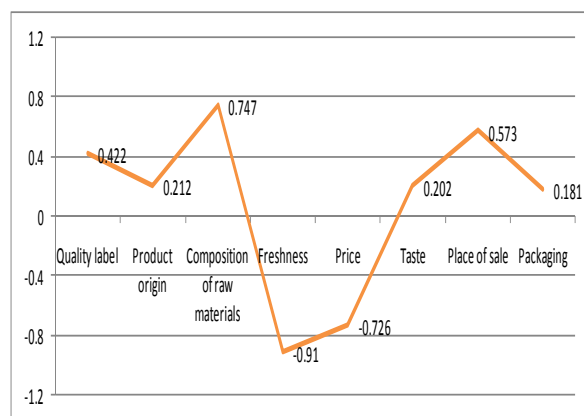


Figure 1 Placement of food products of organic origin
Source: The Authors.

The presented model points to indicators that

supply chain managers need to optimize and develop in order to adjust the placement of organic food products to the needs and expectations of end consumers in the AP Vojvodina market. This implies that all participants in the supply chain must certify and standardize their production and service processes and through transparent labels and quality certificates clearly differentiate organic from inorganic alternatives in our market. The European Commission (EC) by its *Directive 2000/13/EC* unequivocally supports and encourages the introduction and protection of regional quality and origin labels. In our legislative system this area is regulated by the Law on Indications of Geographical Origin.

In addition to the quality label, a declaration must be marked on the packaging or the product itself, which confirms the organic composition of the product without additional flavour, colour, sweetener, emulsifier, etc. Furthermore, in the specification accompanying the product, manufacturers must guarantee the use of pesticides in fruits and vegetables, the method of feeding animals for meat and meat products, milk and milk products, etc.

The biggest challenge for the participants in the supply chain in the AP Vojvodina market is the price that has been indicated in several studies as one of the main limiting factors in the purchase of organic products in the regional market (Vehapi, 2015; Brčić-Stipčević et al, 2011). The organic production market, especially in the Republic of Serbia, is still underdeveloped and there is not enough large volume of consumption that could justify large investments in expensive technology, land, modes of transport, storage and placement of food products of organic origin. Their price is now about 30% higher than of conventional products, and therefore it is a challenge for manufacturers, farmers and trading companies to try to minimize unnecessary costs of change of ownership, storage and physical distribution through vertical integration and collaboration, in order to reduce the price of these products. The assumption is that it would amount to a maximum of 10% above the price of non-organic alternatives and thus make organic food more accessible to a growing number of consumers (Končar et al, 2018). Besides, many studies confirm that organic production can be next interesting an attractive placement for employment and growth of self-employment (Nica, 2018; Koppel & Kolencik, 2018).

A somewhat less importance is given to freshness and the place where food products are sold, although participants in the supply chain

should not neglect more efficient promotion of organic food, investments in modern packaging and packaging systems, improvement of taste through higher content of vitamins, nutrients, etc. Although these indicators do not currently have a statistically significant contribution, studies show that in the near future, larger investments in promotion, packaging and taste, along with all previously fulfilled indicators, will clearly differentiate food products of organic origin in our market.

Conclusion

The market of organic products, especially food products of organic origin, is constantly increasing. More and more participants in the supply chain are redirecting their production and service processes towards organic technology. As a result of such tendencies, demand for organic food is increasing. Hence, there is a need for researching the retail sector of food products of organic origin, due to the growing importance of this sector in the overall economic development of AP Vojvodina.

The obtained results showed that the final consumers, when choosing and purchasing food products, mostly appreciate Quality labels, Composition of raw materials, Price, Product origin, Freshness and Place of sale. Statistical tests have determined significant contributions of these indicators to the decision to purchase food products of organic origin. In other words, the conclusion of the research is that with the growth of these indicators, consumers show greater readiness to purchase organic products, except for the price where there is a negative correlation.

Growth in organic food prices is redirecting final consumers to purchasing alternative products from conventional processing.

The practical significance of the research is reflected in the fact that the presented results unambiguously show to the supply chain management and all participants, in which indicators it is necessary to invest and to what extent they need to be developed and optimized in order to make the placement of food products of organic origin more efficient, economical and profitable in the AP Vojvodina market.

The lack of research is the territorial limitation on the market of AP Vojvodina, exclusively as a result of the authors' knowledge of the structure of placements in the domicile market. This would result in suggestions for future research that should

include a wider market segment (e.g. Western Balkans, South-eastern Europe), comparative analysis between EU and non-EU countries, analysis and influence of subindicators within the tested groups, etc. [SM](#)

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