Purchasing Behaviors of Consumers from third Countries on European Union Markets: A Case Study

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Iwona M. Batyk[1]

Abstract:

Purpose: *This article aims to develop models of consumers' purchasing behaviors from the third countries on European Union food market and verify these models using statistical tools. The models were developed considering the socio-demographic characteristics of consumers, geopolitical determinants, purchase decision determinants, including the economic, marketing, socio-cultural, psychological, and regional ones, and the risk accompanying purchase decisions.*

Design/Methodology/Approach: *The models were developed based on face-to-face interviews conducted by the author in the years 2012-2016, among 1,022 Russians purchasing goods on the EU border market. Logistic regression was used to determine relationships between multiple independent variables and the dependent variable. The model was verified using a multivariate analysis of the factors determining these behaviors and scoring methods.*

Findings: *The marketing, psychological, economic, socio-cultural, and regional factors had the most significant impact in the model determining the determinants of purchasing food for one's own needs. In turn, professional inactivity, LBT, the possibility of transporting goods across the border, and the average monthly income per person in a household had the most significant impact in the model determining the determinants of food purchase for sale.*

Practical implications: *The practical possibilities of using such analyses are essential for designing the conditions for cross-border cooperation and its implementation and the EU setting the rules for the operation of local border traffic between the EU and third countries.*

Originality/Value: *The conducted identification and analysis of the critical determinants of the purchase of food goods by Russian consumers on the Polish market may be a reference point for the behaviors of consumers from third countries on the EU markets and the establishment of the law and rules governing the transport of goods across the border in the context of the local border traffic and the Schengen area.*

Keywords: *Consumer behaviors, border markets of the European Union, food market, Russia.*

JEL classification: *D12, D91, E27.*

Paper Type: *Research study.*

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[1]*University of Warmia and Mazury in Olsztyn, Faculty of Economic Sciences,*
iwona.batyk@uwm.edu.pl;

1. Introduction

Processes are taking place in the modern world, including globalization, European integration, and the internationalization of life trigger social and cultural transformations, leading to the re-orientation of lifestyle and re-evaluation of consumers' actions and behaviors, including their pursuits, aspirations, and values. Market trends evolve along with the development of mass communication and disseminating specific ways of behavior by these means. Changes in consumer behavior are correlated with an increase in demographic and social mobility due to the increase in living standards and the facilitation of crossing state borders.

Among the numerous models of consumer behavior presented in the literature, no pattern has been found that would provide a helpful taxonomy aiding the construction of a model of purchasing decisions of third-country consumers on the border markets of the European Union. In the present study, we have faced the same problem as many other scientists, i.e., the lack of statistical data on the behavior of third-country consumers on EU border markets and the lack of publications on the behavior of Russians on the EU markets.

This study aimed to develop models of consumers' purchasing behaviors from the third countries on the EU food market and verify these models using statistical tools on the example of behaviors of Russians on the Polish border market. The models were developed based on results of the own study, considering geopolitical determinants; the socio-demographic characteristics of consumers; purchase decision determinants classified in five areas, including the economic, marketing, socio-cultural, psychological, and regional ones; as well as the risk accompanying purchase decisions. The differentiating variable of purchase decision was the intended use of the purchased goods – for own needs or sale.

Bearing in mind the needs of entrepreneurs on the EU border markets, it is reasonable to analyze the market behavior of consumers on the EU border. The practical possibilities of using such analyses are essential for designing the conditions for cross-border cooperation and its implementation and the EU setting the rules for the operation of local border traffic between the EU and third countries.

2. Literature Review

Various scientific concepts have failed to comprehensively explain consumer behavior, which is a highly complex issue. The magnitude of this complexity is determined, to a large extent, by the impact of environmental stimuli that are of physical, social, and institutional nature. Consumer behaviors depend on the type of a purchased product, and their complexity is due to the impacts of various needs and motives of purchase and the effects of endo- and exogenous factors.

The processes that mainly affect consumer behaviors on the markets include globalization, integration processes in Europe, and internationalization of life.

Globalization of the economy and following the behaviors of other countries' behaviors facilitate the unification of consumer behaviors. The behavior of consumers on the border markets reveals tendencies to adopt consumption patterns of the residents of neighboring countries, which is due to the effects of consumption globalization and mass media. The globalization of consumption is becoming similar and merging on a global scale (Senda, 2000). On the one hand, this process is triggered by the growing mobility of consumers, who adopt new consumption patterns based on experiences from other cultures.

On the other hand, it is an outcome of actions of global enterprises, which, by directing a unified offer to different cultural groups, influence their experiences and preferences. Some studies have analyzed various factors that attract multinational corporations to particular markets (Dunning, 1992; Crittenden, 2010; Hennart, 2012). In the case of the Russian consumers, it should be borne in mind that they are very diverse in terms of culture, mentality, values, and financial possibilities (Chernova *et al.,* 2017).

The phenomena of cultural globalization and the emergence of the global consumption pattern significantly impacted consumer behavior (Schiffman and Kanuk, 2004). The progressive unification of consumption is related to imitation in production and consumption (Zalega, 2012). The globalization of consumption is one of the effects of the globalization of markets. The functioning of economic systems in a globalized world largely depends on the indicators of consumer optimism and the tendency to buy new products. This is especially important in the context of the current world situation caused by the Covid-19 pandemic (Starostin *et al.,* 2020).

Changes taking place in the international environment and the development of information and communication technologies force the need for a new look at consumer behavior, emphasizing mental models that include socio-cultural and psychological factors. In the purchasing process, the consumer analyzes only selected components that constitute the informational value; the decision depends on the satisfied need, food category, brand, urgency of purchase, and the place of sale of the product (Ankiel *et al.,* 2020). Behavioral change is strongly affected by psychosocial features (Mahon *et al.,* 2006), while the behavior is determined, among others, by who the consumers are, what are their views, what are their values, and what social group they belong to (Aronson *et al.,* 2010).

3. Materials and Methods

The behavior of consumers from third countries on the EU food market aims to show the relationship between various elements of the purchasing decision-making process. These relations include features manifested in mutual dependencies and theoretically explain the implementation of a specific action, which is the act of purchase or no purchase. The following main assumptions were adopted in this model's construction:

- consumer behavior is characterized by the sequence of the consequences of all the indicated factors, having a cause-and-effect nature,
- individual elements influence behavior to a varying degree – depending on their nature and socio-economic situation,
- economic factors tend to change very quickly over time while assuming the amount of the consumer's income as a constant.

The models were developed based on face-to-face interviews conducted by the author in the years 2012-2016, among 1,022 Russians purchasing goods on the EU border market. The choice of the research period was deliberate and was based on determinants critical in terms of border markets operation, such as the functioning of local border traffic (LBT), embargo on agri-food products, large fluctuations in the exchange rate, and LBT suspension. As the study period was characterized by very high variability of political, economic, and social factors, it was divided into four stages:

- Stage I: from 27 July 2012 (beginning of LBT between Poland and Russia) to January 2014. The border traffic on the Polish-Russian border increased significantly, and so did the purchasing activity of consumers;
- Stage II: from February to December 2014. In February 2014, Russia imposed a ban on importing agri-food products from EU countries, and in December, the value of the Russian ruble fell sharply. There has been a further increase in border traffic and the expenses incurred by Russians in Poland;
- Stage III: from January 2015 to 3 July 2016 (LBT suspension). There was a relative stagnation in the currency market and the ban on importing agri-food products from the EU to Russia. Border traffic has decreased, and Russian spending in Poland has been limited;
- Stage IV: from 4 July to December 2016. There was a significant decrease in the intensity of border traffic and Russian spending in Poland. It was a period of political tensions and hostile media propaganda influencing the public mood.

The study considered the following socio-demographic characteristics of consumers: gender, age, place of residence, number of persons in the household, economic activity, and average monthly income per capita in the household. The assessment of functional relationships between the influence of stimuli determining purchasing decisions and the declared purchase of goods took account of the number of characteristics specified for each type of factor, which played the role of independent variables. The model design included the assessment of the following characteristics belonging to 5 groups of factors:

- economic: price, quality perceived by physical features, external appearance, functional features, health values, quality of life, certificates, and approvals;
- marketing: commercial promotions, product selection, product brand, advertising;

- socio-cultural: recommendation of family/friends, following the behavior of residents of other countries;
- psychological: fashion, novelty on the market, uniqueness, habits, prestige, and reflection of wealth;
- regional: operation of LBT, the possibility of transporting goods across the border.

The research allowed identifying consumer profiles in the context of their behavior on the EU border market, determinants of purchasing decisions, and the risk perceived by consumers. The differentiating variable of purchasing behaviors was the intended use of the purchased goods – for own needs or sale.

Logistic regression was used to determine relationships between multiple independent variables and the dependent variable. The model was verified using a multivariate analysis of the factors determining these behaviors and scoring methods. The latter methods are applicable in all research areas in which the researcher's task is to predict the implementation of one of the two possible outcomes of a given event. Scoring methods are used, among others, in economics to study consumer behavior on the market (Risselada *et al.,* 2010), the effectiveness of market activities (Skuz, 2003), or risk assessment in the management process (Baron and Bráza, 2006). They allow identifying the factors that influence purchasing decisions and examining the probability that such an event will occur in the future. The scoring model assigns the probability of event realization using a set of features (predictors). On this basis, it is possible to predict a specific event in individuals and the entire population (Wycinka, 2013). The model is based on a specific part of the population whose characteristics and behavior patterns are already known.

It employs a logistic regression analysis, which may establish the probability of purchase (Y = 1). Variable Y takes a zero-one value and determines the affiliation of the examined consumer to two groups: purchasing and not-purchasing goods on the EU border market. It was assumed that the cumulative logistic function of probability is the basis in this model:

$$\ln \left(\frac{P_{ii}}{1 - P_{ii}} \right) = Z_i = a + b_i X_i + \ldots + b_n X_n + E_r \tag{1}$$

ln – log of the odds ratio,
P_i – the probability that the dependent variable will take the value 1 (it is tantamount to buying goods),
Z_i – linear combination of independent variables,
a – constant,
b_i – coefficients (weights) to be estimated,
($X_i \ldots X_n$) – values of the assessment of the impact of factors,
E_r – rest of the model.

The vector (Xi ... Xn) includes the following elements: the study stage, the socio-demographic characteristics of consumers, and the stimuli influencing the purchasing decisions of consumers. As we had planned to present the impact of all the considered explanatory variables on the dependent variables in individual logistic regression models, we decided to present the results of the analysis of complete models. In the final stage of exploration, the model takes the following form:

$$Zi = f[GP + SD + (E, M, SC, P, R) + (RPF, RE, RSC, RP, RR)] \qquad (2)$$

Zi – linear combination of independent variables,
GP – geopolitical determinants,
SD – socio-demographic variables,
E – values of the assessment of the impact of economic factors,
M – values of the assessment of the impact of marketing factors,
SC – values of the assessment of the impact of socio-cultural factors,
P – values of the assessment of the impact of psychological factors,
R – values of the assessment of the impact of regional factors.
RPF – values of the assessment of risk associated with the physical and functional characteristics of the product,
RE – values of the assessment of risk associated with the economic factors,
RSC – values of the assessment of risk associated with the socio-cultural factors,
RP – values of the assessment of risk associated with the psychological factors,
RR – values of the assessment of risk associated with the regional factors.

Before the model parameters had been estimated, the data set was assessed to control the collinearity phenomenon. To objectify the research results, it was assumed that each variable and information provided by the respondent was equally valuable, i.e., that they influenced the effect of the purchasing decision to the same extent. Based on the collected information, significant explanatory variables were selected, measurable (quantitative) and non-measurable (qualitative) variables. In scoring models, no assumption is required regarding the relationship between the explanatory variables and the dependent variable. In building the model, all explanatory variables were subjected to the discretization process, i.e., the separation of variable variants for which the level of implementation of purchasing decisions differed. All variables were grouped into categories of factors, using the measure maximization criterion method, the so-called Kulback-Leibler divergence, which informs about the predictive power of a given variable. Using different sets of predictors and modifying the way of variable discretization, many scoring models were obtained. Due to the lack of appropriate premises, no reduced models were designed. The final logit models determine the probability of purchasing goods by third-country consumers on the EU food market.

The scoring methods assign point values to individual features. The probability of the occurrence of the phenomenon under study can be assessed after summing them up. As a result of logistic regression, explanatory variables were converted into points. Directional coefficients determining the influence of particular characteristics on the

probability of purchase assume positive and negative values. The higher the point value, the higher the likelihood of a purchase. In the next stage of model construction, the estimated odds ratios were converted into points. Ultimately, all variants of the explanatory variables and the scoring points calculated for them were collected in the scoring table. The table contains numerical values that impart weight to individual factors determining the purchasing decisions. After adding up these values, a total value is obtained that symbolizes the probability of purchasing goods. The cut-off point, i.e., the so-called threshold value above which the event is expected to occur, and the variation coefficient were determined. The Receiver Operating Characteristic (ROC) curve and the ROC coefficient were used to assess the correctness of the ranking of the predictive indicators.

The significance of differences between the probability distributions of two separate groups of predictive indicators was assessed using the divergence coefficient, while the predictive ability for individual variables was determined by the Information Value (IV) coefficient. The models were assessed on a test sample. The research sample was divided into 3: 1, of which 75% of the respondents were a training sample for scoring models, and 25% were the test sample. Statistical verification of the model prevented the so-called model overfitting, which occurs when the model fits very well to the data from the sample on which it was built, but incorrectly qualifies the predictive indicators in the populations on which it is used. This is when many variables in the model do not describe the regularities of a general nature but are related to the specificity of the predictive indicators in the learning sample.

4. Results and Discussion

In order to determine the variables determining the purchasing decisions of third-country consumers on the EU food markets, an attempt was undertaken to assess the relationship between the declared probability of purchasing goofs for own needs and the impact of situational factors sociodemographic features, as well as incentives and purchase risk. The discretization of explanatory variables allowed distinguishing five groups of representatives. Factor loadings were determined for individual variables in the following groups, which prove the significance level of their influence on purchasing decisions. After compiling all the variables, the most significant factor loadings (>0.700) were determined for the following variables in order: in group 1 – professional activity (0.832) and average monthly income per household member (-0.744); in group 2 – psychological factors (–0.712); in group 3 – age (0.738); in group 4 – economic factors (0.925); and in group 5 – the number of persons in the household (0.726). After assessing the factor loadings and correlations, the following variables were eliminated in the model due to the low values: gender, education, and the number of persons in the household.

Despite the high factor loading of the variable the number of persons in the household, it had a fragile predictive power (0.03), calculated at the stage of variable categorization. This is confirmed by the ranking of predictors, in which the key

positions were taken by professional activity (IV coefficient = 0.79), regional factors (0.89), situational variables differentiating the study stages (0.38), average monthly income per household member (0.38), and economic factors (0.08). In the model determining the determinants of food purchase for own consumption, the highest positive values were assigned to marketing (169 scoring points), psychological (137), economic (136), socio-cultural (114), and regional (71) factors (Table 1). The scoring analysis showed that negative values were assigned to only three variables: the impact of the marketing factor (–51 points), economic factor (–23), and professional inactivity (–19). The above characteristics reduce the likelihood of a purchase.

Table 1. *Scoring table for variables determining the purchase of food for own needs*

Variable	Wait of Evidence	Rating	s. Walda	Level p	Scoring	Rounded scoring
Research stage						
I	-81.872	0.00919	8.94518	0.00278	12.442	12
II	-19.742	0.00919	8.94518	0.00278	28.917	29
III	93.258	0.00919	8.94518	0.00278	58.881	59
IV	1.157	0.00919	8.94518	0.00278	34.459	34
Neutral value	-	-			34.466	34
Age						
15-24 years	60.963	0.00621	1.77423	0.18286	45.075	45
25-34 years	8.977	0.00621	1.77423	0.18286	35.760	36
35-44 years	19.365	0.00621	1.77423	0.18286	37.622	38
45-54 years	11.132	0.00621	1.77423	0.18286	36.146	36
> 54 years	-53.001	0.00621	1.77423	0.18286	24.655	25
Neutral value	-	-			34.174	34
Place of residence						
Village	9.217	0.0461	2.24461	0.13408	46.413	46
City	-3.122	0.0461	2.24461	0.13408	30.000	30
Neutral value	-	-			34.159	34
Professional activity						
Own business	3.852	0.008	7.15455	0.00748	35.041	35
Government company employee	40.472	0.008	7.15455	0.00748	43.494	43
Administration employee	58.833	0.008	7.15455	0.00748	47.732	48
Unemployed	-231.917	0.008	7.15455	0.00748	-19.382	-19
Student	44.484	0.008	7.15455	0.00748	44.420	44
Pensioner	-8.760	0.008	7.15455	0.00748	32.130	32
Neutral value	-	-			31.877	32
Average monthly income per person in a household						
< 10 thous. rubles	-113.132	0.00608	2.834	0.09229	14.305	14
10-15 thous. rubles	30.698	0.00608	2.834	0.09229	39.537	40
15-20 thous. rubles	4.654	0.00608	2.834	0.09229	34.968	35
20-25 thous. rubles	42.594	0.00608	2.834	0.09229	41.624	42
> 25 thous. rubles	46.771	0.00608	2.834	0.09229	42.357	42
No answer	-0.829	0.00608	2.834	0.09229	34.006	34

Neutral value	-	-			34.204	34
Economic determinants						
1 factor	-26.219	0.07525	8.59392	0.00337	-22.776	-23
2-3 factors	28.245	0.07525	8.59392	0.00337	95.479	95
> 3 factors	46.844	0.07525	8.59392	0.00337	135.862	136
Neutral value	-	-			34.463	34
Marketing determinants						
1 factor	-50.604	0.05836	9.21376	0.0024	-51.061	-51
2-3 factors	6.169	0.05836	9.21376	0.0024	44.539	45
> 3 factors	80.138	0.05836	9.21376	0.0024	169.097	169
Neutral value	-	-			35.070	35
Psychological determinants						
0 factor	-2.202	0.31833	10.23737	0.00138	13.928	14
> 0 factor	11.225	0.31833	10.23737	0.00138	137.250	137
Neutral value	-	-			34.200	34
Socio-cultural determinants						
0 factor	7.739	-0.09767	7.68536	0.00557	12.342	12
> 0 factor	-28.412	-0.09767	7.68536	0.00557	114.221	114
Neutral value	-	-			34.174	34
Regional determinants						
0 factor	53.050	-0.00724	1.66021	0.19757	23.070	23
> 0 factor	-174.648	-0.00724	1.66021	0.19757	70.636	71
Neutral value	-	-			35.636	36
Risk related to the physical and functional characteristics of the product						
1 factor	12.128	0.00424	0.38658	0.5341	35.636	36
2 factors	-26.149	0.00424	0.38658	0.5341	30.953	31
3 factors	26.997	0.00424	0.38658	0.5341	37.455	37
> 3 factors	63.834	0.00424	0.38658	0.5341	41.961	42
Neutral value	-	-			33.827	34
Risk related to economic factors						
0 factor	1.106	-0.03952	1.35228	0.24488	32.891	33
> 0 factor	-21.515	-0.03952	1.35228	0.24488	58.686	59
Neutral value	-	-			34.153	34
Risk related to socio-cultural factors						
0 factor	11.451	-0.0169	2.42828	0.11916	28.568	29
> 0 factor	-46.027	-0.0169	2.42828	0.11916	56.596	57
Neutral value	-	-			34.190	34
Risk related to regional factors						
0 factor	-30.999	0.00531	0.47862	0.48905	29.402	29
1 factor	14.302	0.00531	0.47862	0.48905	36.343	36
> 1 factor	144.927	0.00531	0.47862	0.48905	56.357	56
Neutral value	-	-			34.191	34

Source: *Own research.*

The results of the scoring analysis indicate that the purchase of food for own needs was statistically significantly influenced by geopolitical determinants at particular stages of the survey, the professional activity of respondents, and economic, marketing, psychological, and socio-cultural factors. Logistic regression analysis confirmed the lack of a significant impact of the possibility of transporting agri-food goods across the border and the risk accompanying purchasing decisions. The massive presence of Russian consumers had a significant impact on retail trade-in Polish cities and towns located in the local border traffic zone (Batyk, 2020). The suspension of local border traffic did not stop the Russians from coming to Poland, but it did have some quantitative restrictions (Bobryk, 2020).

When analyzing the results of the scoring table, attention should be paid to the significant point spreads in the groups of variables related to the following factors: economic (from –23 to 136 scoring points), marketing (from –51 to 169), psychological (from 14 to 137), and socio-cultural (from 12 to 114).

The identified groups of factors were part of the conscious control of the contextual conditions in making purchasing decisions by consumers on the EU food market. The risk accompanying these decisions, posed by the changes taking place in the economic and social environment, did not significantly impact. The individual characteristics of consumers, their emotional experiences, and their willingness to take risks should not be depreciated. The consumer interpreted objective situations, and the variants of actions taken were subject to evaluation about the goals pursued by the buyer.

Socio-cultural factors, such as the recommendation of family and friends and following the behavior of residents of other countries, had a substantial impact on the purchasing behavior of third-country consumers on the EU food market. Purchase preferences may have changed due to opinions from relatives, opinion leaders, or people who have tested a given product.

A threshold value at the level of which the probability of buying food on the EU border market increases were determined for the model. It reached 487 points and was obtained by 580 respondents. Above this threshold, the probability of a purchase is greater than 50%. The surveyed group included people who declared the purchase of these goods, having from 303 to 630 points. The analyzed model was characterized by a low variation coefficient (8%).

Comparing the results for the training sample and the test sample indicates model stability. As a result of testing the model, the ROC coefficient was obtained at the level of 0.789 for the training sample and at 0.844 for the test sample, which indicates the correctness of the classifier (model) selection. The results of the comparative analysis confirm the better prognostic properties of the model for the test sample. Moreover, the divergence coefficient for the test sample was higher (2.080) than that for the training sample (1.385), proving the lowest significance of differences between the probability distributions of the two distinguished samples.

The second model identifies the determinants of purchasing decisions of third-country consumers on the EU cross-border market regarding food for resale. The following variables had statistically significant values of factor loadings (> 0.700) in the presented order: in group 1 – marketing factors (-0.848); in group 2 – psychological factors (–0.712); in group 3 – geopolitical variables differentiating the stages of the study (0.764); in group 4 – there were no statistically significant factors; and in group 5 – the number of persons in the household (-0.740). After assessing the values of factor loadings and correlations, the following variables were eliminated in the model due to the lack of statistical significance: gender, education, and the number of persons in the household. Despite the high factor loading of the variable concerning the number of people in the household, it had a fragile predictive power (0.03), calculated at the stage of variable categorization. This is confirmed by the ranking of predictors, in which the key positions are taken by: professional activity (IV coefficient = 2.23), regional determinants (1.39), situational variables differentiating the stages of the study (1.20), average monthly income per household member (0.60), and economic factors (0.23).

The assessment of functional relationships revealed statistical significance (at the level of $\alpha \leq 0.05$) in the case of geopolitical variables differentiating the stages of the study, the possibility of transporting goods across the border, the professional activity of respondents, and average monthly income per household member (Table 2). The highest positive values were determined for the following characteristics: professional activity – category of unemployed (186 points), stage of the study (stage I, 157), the possibility of transporting goods across the border (132), average monthly income up to 10,000 rubles per household member (103), and professional activity – category of the retired (102).

The scoring analysis showed that negative values (indicating the lowered likelihood of purchase) were obtained for the following characteristics: school pupil or student status (–171 points), stage IV (–41) and stage III of the study (–38), risk related to the physical and functional characteristics of the product (–27), the age category of 15–24 years (–18), and marketing factors (–10). The indicated characteristics reduce the probability of buying food for resale.

The threshold value of points at which food was purchased for sale was 487 points and was achieved by 453 respondents. The analyzed model was characterized by a high value of the coefficient of variation reaching 30%. There were considerable disproportions in points among the respondents declaring a purchase (the buyers), i.e., persons who received only 3 points and persons with as much as 996 points. This proves a wide variety of responses and a very individual assessment of the factors determining the purchase.

A huge discrepancy in scoring points was also noted for the variable determining the possibility of transporting goods across the border (from 5 to 132 points). In the case of consumers making purchasing decisions on the markets of other countries, the

purchase process does not end with the payment for the product or service, but at the stage when the consumers confirm the correctness of their choice and can use the purchased product in the country of their residence. The purchasing decisions of third-country consumers on the EU border market depended on the impact of geopolitical factors and the conditions under which those decisions were made.

Table 2. *Scoring table for variables determining the purchase of food for sale*

Variable	Wait of Evidence	Rating	s. Walda	Level p	Scoring	Rounded scoring
Research stage						
I	184.320	0.02312	27.29334	0	156.733	157
II	35.806	0.02312	27.29334	0	57.659	58
III	-107.595	0.02312	27.29334	0	-38.004	-38
IV	-111.649	0.02312	27.29334	0	-40.709	-41
Neutral value	-	-			34.019	34
Age						
15-24 years	-289.722	0.00621	1.40443	0.23598	-18.141	-18
25-34 years	-12.987	0.00621	1.40443	0.23598	31.445	31
35-44 years	-8.765	0.00621	1.40443	0.23598	32.202	32
45-54 years	1.692	0.00621	1.40443	0.23598	34.075	34
> 54 years	99.143	0.00621	1.40443	0.23598	51.537	52
Neutral value	-	-			30.627	31
Professional activity						
Own business	19.191	0.0173	11.00038	0.00091	43.352	43
Government company employee	-24.081	0.0173	11.00038	0.00091	21.752	22
Administration employee	-61.545	0.0173	11.00038	0.00091	3.051	3
Unemployed	304.500	0.0173	11.00038	0.00091	185.770	186
Student	-409.480	0.0173	11.00038	0.00091	-170.629	-171
Pensioner	137.191	0.0173	11.00038	0.00091	102.254	102
Neutral value	-	-			26.645	27
Average monthly income per person in a household						
< 10 thous. rubles	144.601	0.0167	7.79706	0.00523	103.450	103
10-15 thous. rubles	-51.658	0.0167	7.79706	0.00523	8.880	9
15-20 thous. rubles	-9.371	0.0167	7.79706	0.00523	29.257	29
20-25 thous. rubles	-61.123	0.0167	7.79706	0.00523	4.320	4
> 25 thous. rubles	-48.885	0.0167	7.79706	0.00523	10.217	10
No answer	2.105	0.0167	7.79706	0.00523	34.787	35
Neutral value	-	-			35.092	35
Economic determinants						
1 factor	43.559	0.0125	1.10536	0.29309	49.483	49
2-3 factors	-57.033	0.0125	1.10536	0.29309	13.202	13
> 3 factors	2.105	0.0125	1.10536	0.29309	34.532	35
Neutral value	-				33.340	33
Marketing determinants						

1 factor	66.650	-0.02292	1.75229	0.18559	-10.305	-10
2-3 factors	-20.691	-0.02292	1.75229	0.18559	47.456	47
> 3 factors	-60.784	-0.02292	1.75229	0.18559	73.971	74
Neutral value	-	-			34.056	34
Psychological determinants						
0 factor	5.768	-0.00962	0.04232	0.83702	32.171	32
> 0 factor	-29.953	-0.00962	0.04232	0.83702	42.086	42
Neutral value	-	-			33.801	34
Socio-cultural determinants						
0 factor	-12.759	0.01885	0.92990	0.33489	26.832	27
> 0 factor	46.450	0.01885	0.92990	0.33489	59.036	59
Neutral value	-	-			33.733	34
Regional determinants						
0 factor	-67.133	0.01463	9.37421	0.0022	5.433	5
> 0 factor	231.755	0.01463	9.37421	0.0022	131.604	132
Neutral value	-				38.766	39
Risk related to the physical and functional characteristics of the product						
1 factor	-14.176	0.01105	0.86729	0.35171	29.253	29
2 factors	33.056	0.01105	0.86729	0.35171	44.312	44
3 factors	-28.547	0.01105	0.86729	0.35171	24.670	25
> 3 factors	-191.863	0.01105	0.86729	0.35171	-27.400	-27
Neutral value	-	-			32.946	33
Risk related to economic factors						
0 factor	-6.650	0.01462	1.02551	0.31122	30.967	31
> 0 factor	142.648	0.01462	1.02551	0.31122	93.948	94
Neutral value	-	-			34.048	34
Risk related to socio-cultural factors						
0 factor	-21.313	-0.01064	0.74303	0.38869	40.315	40
> 0 factor	86.129	-0.01064	0.74303	0.38869	7.330	7
Neutral value	-	-			33.699	34
Risk related to regional factors						
0 factor	-1.220	0.10215	2.97855	0.08437	30.175	30
1 factor	0	0.10215	2.97855	0.08437	33.772	34
> 1 factor	11.664	0.10215	2.97855	0.08437	68.152	68
Neutral value	-	-			39.602	40

Source: *Own research.*

As a result of testing the model, the ROC coefficient was obtained for the training set at the level of 0.950 and for the test set at the level of 0.986, proving the correctness of the classifier (model) selection. The results of the comparative analysis also indicated better prognostic properties of the model for the test sample. Moreover, the divergence coefficient determined for the test sample was higher (7.700) than that

computed for the training sample (4.536), proving the low significance of the differences between the probability distributions of the two distinguished samples.

5. Conclusions and Recommendations

The conducted analyses allowed expanding the knowledge of the impact of economic, marketing, psychological, socio-cultural, and regional factors on the purchasing behavior of consumers from third countries on the EU border markets. A characteristic feature of the developed models, which is also an original attribute that distinguishes them from other models presented in the literature, is the assignment of factor loading values to the examined factors, influencing purchase decisions.

The following factors had the most significant impact on the purchase decision in the model defining the determinants of purchasing food for own needs: marketing factors (trade promotions, product selection, product brand, advertising), psychological factors (fashion, novelty on the market, uniqueness, habits, prestige, and reflection of wealth), economic (price, quality, utility features, health values), socio-cultural (family recommendation, following the behavior of residents of other countries), and regional (functioning of the local border traffic, the possibility of transporting goods across the border). At the same time, marketing and economic factors and professional inactivity reduced the probability of purchasing food for one's own needs. Both the studied socio-demographic characteristics and regional factors had a minimal influence on the lack of decisions about purchasing food on the EU border market.

In turn, professional inactivity, LBT operation, the possibility of transporting goods across the border, and the average monthly income per household member had the most significant impact in the model determining the determinants of food purchase for sale (the most impoverished people). The decreased probability of purchasing food for resale was affected by the following factors: school pupil or student status, the embargo on the import of agri-food products to Russia, suspension of LBT, and the risk related to the physical and functional characteristics of the product.

Consumers from third countries on the EU food market depended on the possibility of participating in the LBT and the impact of the social environment. The changes in customs regulations were due to the decisions resulting from geopolitical conditions, and while they did not affect the purchase of food for one's own needs, they were important in making purchase decisions regarding goods for resale.

The development of EU border markets depends not only on the entities operating on these markets but also on the behavior of consumers from third countries. Therefore, attention needs to be paid to the specificity of these consumers, determinants, and risk accompanying purchasing decisions, as well as to critical geopolitical and regional factors. Identifying and determining the impact of these factors are of great importance in the perspective of border market operation and cross-border cooperation development. Models of the consumer's response to the analyzed stimuli

may drive the strategies of choices and consumer preferences in the context of specific types of environmental extortions and regional factors.

Considering complex relations between the EU and Russia, it is difficult to overestimate the experience from the recent years of cooperation and LBT operation. The economic rationale that dominates consumers' purchasing decisions on the EU border markets is changing under the influence of changing geopolitical conditions. These conditions turn out to be a very fragile element of the development of border markets. Therefore, when deciding to introduce LBT in the future, due care should be taken to anticipate the effects of such decisions, mainly from the perspective of the poorest social groups. The idea of sustainable development of border areas should be an imperative that requires considering this development in a broad aspect, going far beyond the issues related to the border trade.

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