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DIMENSIONS OF THE COO EFFECT REFERRING TO SERVICES AND PRODUCTS – POLISH-LITHUANIAN COMPARISONS

Abstract:

The COO effect is defined as an influence of an image of a particular country on the assessment of products and services coming from a given country with ensuing consumer attitudes and behavior. The article presents further adaptation of the models discussed in the literature in order to find universal attributes which would be adequate to the deeper analysis of the COO. The analyzed model of COO effect consists of the following dimensions: innovativeness, diversity, prestige quality. The following hypotheses were verified. (1)The COO dimensions influence the assessment of offers (products and services), (2) consumer's country of origin influences the assessment in respect of the particular COO dimensions.
To analyze a data collected in Poland and Lithuania the analysis of regression has been applied. Results show that country of consumer origin has got a stronger impact on assessment of offer comparing to COO's dimensions. However it has been indicated that the assessment of products and services is differentiated, depending on the assumed COO dimensions. And some additional results indirectly show the multi-dimensional nature of the COO.

Keywords:

country-of-origin (COO) effect, the dimensions of the COO effect, consumers' behavior, services marketing

JEL Classification: A10

Introduction

The effect which is exerted by a particular country of origin on purchasing behaviour of consumers has attracted scholars' attention for several decades. As a result an abundancy of scientific achievements have been collected in the field of international marketing and consumer behaviour. Initially, publications were mainly focused on the analysis of the COO effect in the reference to material goods. A review of expert literature provided in 2001 by Javalgi, Cutler and Winans (2001) indicated only 19 studies which referred to services in the previous 20 years. Having analysed 99 publications, Al-Sulaiti and Baker (1998) indicated only seven. Despite scholars' growing interest, the question of the COO effect in the field of services has not been so far analysed in a sufficient way. (Ahmed, Johnson, Ling, Fang, & Hui, 2002; Chattalas, Kramer and Takada, 2008; d'Astous, Voss, Colbert, Carù, Caldwell & Courvoisier, 2008; Boguszewicz-Kreft, 2014).

The reasons for such a situation can be explained by statistics. Although services indicate dominating significance in developed countries where the GDP is measured by employment, the statistical data suggest that the value of international service exchange is much lower than the value of goods exchange, for example in the countries of the European Union by two or three times (Eurostat, 2013). It is possible to indicate two main reasons for such disproportion. The first reason refers to a feature which is characteristic for most services: inseparability of production and consumption. It results in the fact that services are connected with the factors and processes of their production. The situation complicates and hampers international trade because consumers are forced to go to the country of their service provider or to transfer the production factors to the country of consumers. The second reason results from the barriers of a legal character which are established by numerous countries to protect their home markets from the competition of foreigner service providers. The direction of changes in the macro-economic environment indicates that the abovementioned obstacles will be gradually decreased because of technical advancement, allowing providers to overcome problems concerning service distribution, also because of growing service outsourcing from the countries where salaries are lower and the liberalisation of legal regulations which refer to international trade of services[1].

Growing tendencies of international exchange of services make the COO research necessary. Considering the specific character of services, automatic transferring of the results obtained in the research on material goods onto the field of services is not well legitimized.

Due to all the abovementioned facts, the authors of the article have decided to extend their field of research onto services. The presented analysis refers both to material goods and to services. The future publications will present the results of the analysed phenomenon exclusively in the context of services.

[1] It is regulated by General Agreement on Trade in Services within the World Trade Organisation; in the EU countries: the Directive on Services 2006/123/EC dated on 12th Dec. 2006 and most of other trade blocs (NAFTA, CETA).

The analysis of expert literature indicates an interesting research gap which refers to a question if the COO is a single- or multi-dimensional phenomenon, as so-far presented considerations are ambiguous. The results of the research are presented below. The research aims at the verification of a hypothesis concerning a large number of dimensions which are combined into an image of products and services coming from various European countries. The analysis also refers to the question whether there is a differentiated assessment of an offer considered globally and in relation to the particular dimensions of the COO, depending on the consumers' country of origin.

Additionally, it should be mentioned that there are only few research studies presented in international expert literature which refer to the countries of Central and Eastern Europe and comparisons between them. The following article fills in that gap and the presented results may find practical use in the planning of marketing strategies intended for foreign markets.

In the research, *Statistica 10* software has been used to analyze a data collected in Poland and Lithuania, as a statistical method, the analysis of regression has been applied.

The article is started with theoretical considerations which refer to the concept of the COO and its dimensions. Then, a methodology of empirical research has been described. Subsequently the analysis of collected data has been presented.

The COO effect in marketing

The COO effect can be defined as an influence of an image of a particular country on the assessment of products or brands coming from that country (Figiel, 2004) with ensuing consumer attitudes and behaviour (Sikora, 2008; Balabanis and Diamantopoulos, 2011). Published in 1965, an article by R.D. Schooler urged scientists to consider the problem in expert literature. Since then, the discussed phenomenon has become a research field for numerous authors (for relevant literature reviews, see eg: Bilkey and Nes, 1982, Al-Sulaiti and Baker, 1998; Peterson and Jolibert 1995; Javalgi, Cutler, and Winans 2001; Pharr 2005; Rezvani et al., 2012; Saran and Gupta, 2012). The COO identification by consumers is of a subjective and unintentional character (as cited in Rezvani et al., 2012) and it is not always apt (Balabanis G., Diamantopoulos, 2008, 2011; Lianxi Zhiyong, and Hui, 2010; Melnyk, Klein and Völckner 2012; Martin 2011).

Until now, the scope of research interest has been focused on the COO influence on the assessment of the quality and value of products, perception of risk connected with their purchase, purchasing intentions and decisions, tendencies to pay particular prices. The research has been conducted with the consideration of numerous features referring to various products, methods and variables (Peterson and Jolibert, 1995). Generally, the research has indicated that the image of a country of origin affects the processes of assessment and consumer decision-making, and it comes as a significant factor influencing international marketing (Rezvani et al., 2012).

Factors which affect opinions on countries and products

Factors which affect the COO can be divided into two groups: resulting from purchasers' affiliations and informative factors which are connected with a product (Ahmed et al., 2002). Having provided a broad review of the conducted research, Pharr (2005) presents a model in which she provides further systematization of those elements. Thus, she states that affiliative factors may be divided into endogenous factors, including measurable consumer features (cultural factors: ethnocentrism, aversion to a particular country, stereotypes, dimensions of national cultures in accordance to Hofstede, personal cultural dimensions (Sharma 2011) and demographic factors) and exogenous factors, including the level of economic development of consumers' country. Factors connected with products can be divided into intrinsic factors which refer to the functionality of products (e.g. the type of a product and its complexity), and extrinsic factors which do not affect the functionality directly. Apart from the COO, the sub-group includes reputation of a brand and a seller, prices, guarantees and promotion announcements. Pharr (2005) also indicates the moderators of the COO effect which, apart from the abovementioned factors referring to the product, include individual factors referring to the consumer: the context of consumption (Sharma 2011), the level of involvement, the type of involvement, the knowledge of the product and the expiry date of the product.

The research shows that there are differences in the perception of the country of origin reported by consumers coming from particular countries (Narayana, 1981; Nagashima, 1970; Sharma, 2011).

The COO effect in services

Despite a growing number of research studies on the COO in services, expert literature still indicates their scarcity in numerous fields, which hampers possibilities of drawing general conclusions (Ahmed, Johnson, Ling, Fang and Hui, 2002; Chattalas, Kramer and Takada, 2008; d'Astous, Voss, Colbert, Carù, Caldwell and Courvoisier, 2008; Boguszewicz-Kreft, 2014).

So far, considering services, the research has proved that the COO comes as important information for consumers (Ahmed et al., 2002), it affects the assessment of quality (Wong and Folkes, 2008) the purchase risk (Michaelis et al., 2008) and purchase intentions (Harrison-Walker, 1995; Berentzen et al., 2008; Khare and Popovich, 2010; Bose and Ponnam, 2011; Morrish and Lee, 2011). Considering services, a problem with the identification of a relevant country of origin might appear (Paswan and Sharma, 2004; Sharma, Mathur and Dhawan, 2009; Nicolescu, 2012).

A number of research results which refer to the COO effect in services are convergent with the results of the analyses carried out in the reference to material products (Javalgi et al., 2001). Consumers prefer domestic services and services from the countries of smaller cultural distance (d'Astous et al., 2008; Bruning and Saqib, 2013) and from more developed countries. The research also indicates that the actual

knowledge about a particular country (which weakens the influence of stereotypes) affect the COO effect (d'Astous et al., 2008).

Dimensions of the COO effect

The approach to the structure of the COO has evolved in time. At first, scholars understood it as a one-dimension phenomenon (e.g. Hong & Wyer, 1989) but with time the number of the supporters of its multi-dimensional nature increased. Roth and Romeo (1992) follow that mainstream. They have provided a synthesis of the so-far suggestions, and they have presented a COO model which consists of four dimensions: 1) innovativeness defined as the use of technical advancement and new technologies; 2) design understood as the appearance, colours, style, variety; 3) prestige defined as exclusivity, brand name reputation, status and 4) workmanship understood as durability, reliability, craft and workmanship quality. The authors have conducted their research among students from Ireland, Mexico and the United States. The students have been asked to express their opinion on six categories of material products from ten countries: England, Germany, Hungary, Ireland, Japan, Korea, Mexico, Spain, and the United States.

Bose and Ponnam (2011) refer to that model in their research on the COO effect in entertainment services (music, dance, circus, theatre and film) coming from Brazil, Russia, the UK and the USA assessed by young inhabitants of India. Considering the model presented by Roth and Romeo, it applies the criteria referring to the analysis of material goods, therefore, Bose and Ponman have partially modified their model, assuming the following dimensions: innovativeness, diversity, exclusivity and quality.

The article presents further adaptation of the discussed models in order to find universal attributes which would be adequate to the analysis of the COO in broadly understood services. The authors generally try to follow the original model to preserve the possibility of comparing the results obtained in other results, and the possibility of their generalisation. Thus, the presented model consists of the following dimensions:

1. Innovativeness - the use of the latest knowledge and advanced technology,
2. Diversity- variety, wide range and attractiveness of an offer,
3. Prestige - exclusivity, status, brand name reputation,
4. Quality - reliability, durability, professionalism.

Research Methodology

A questionnaire form. The research has been conducted with the use of a questionnaire form developed by the authors. The questionnaire form has been based on the research method provided by M.S. Roth and J.B. Romeo (1992). In the original questionnaire of the presented research the following dimensions of the COO effect have been distinguished: Innovativeness Diversity, Prestige, Quality.

The respondents have been asked to assess European services and products in terms of the abovementioned dimensions. The questions have been answered with

the use of a six-grade scale. The low values (1,2) have referred to low assessment and the high values (5, 6) have referred to high assessment.

The Polish respondents have received a Polish version of the questionnaire form and the Lithuanian respondents have received its Lithuanian version translated from Polish. The participation in the research has been anonymous and voluntary.

Respondents. 192 respondents have participated in the research. The data have been collected from Polish and Lithuanian students of major study courses in economics.

Table 1. Characteristics of respondents participating in the research

Respondents	N	age		Gender*	
		M	SD	Women	Men
Polish	127	23,43	6,51	59	46
Lithuanian	65	23,02	6,60	20	20
sum	192	23,22	6,55	79	66

**Sum of women and men does not cover with the general number of participants due to the lack of gender information in several questionnaires*

Results

In order to verify below presented hypotheses, the linear mixed model has been used. The model has been selected because the dependent variable, that is namely the evaluation of products and services, has been measured four times (respectively for each dimension of the COO) for each respondent.

In order to consider the similarity in the measurement of the dependent variables for the same consumer, the consumer effect has been treated as a random effect. The maximum-likelihood estimation method has been applied as a method referring to the estimation of the structural parameters of the model. The use of the LRT test to analyse the significance of the parameters of permanent effects requires the use of such an estimation method. Linear mixed models are broadly discussed in the studies by the following authors: Zieliński P. (2010), Radkiewicz, Zieliński (2010), Biecek (2013).

First, the null model has been estimated as a benchmark model for further comparisons.

$$E_{ij} = \alpha_0 + b_{0j} + \varepsilon_{ij} \quad (1)$$

The symbols in the equation presented above refer to the following variables:

E_{ij} - i-th assessment of products and services ($i = 1,...,6889$, i – the number of measurements) in the selected European country declared by the j-th consumer ($j = 1,...,192$)

ε_{ij} - random disturbance, $\varepsilon_{ij} \sim N\left(0,\sigma_0^2\right)$

b_{0j} - random effect, $b_{0j} \sim N\left(0, \sigma^2_{consumer}\right)$

Table 2. Estimates of fixed effects and covariance parameters for model 0.

Model 0[a]				
Estimates of Fixed effects				
Parameter	Estimate	Std. error	T [Wald z for cov. param.]	*p*
Intercept	4,090597	,035861	114,067	,000
Estimates of covariance parameters				
residual $\hat{\sigma}_0^2$	1,410845	,024381	57,867	,000
Intercept [subject=person id] Variance $\hat{\sigma}^2_{consumer}$	,207577	,025204	8,236	,000

[a.] Dependent variable: products' and services' evaluation.

The value of the intercept in the null model corresponds to a general average (that is to the results obtained by the measurement of all the respondents in all four dimensions of the COO). The variance of the results has been divided into two components: interpersonal (that is the random effect for the intercept of the regression equation) and intrapersonal (residual).

Then the coefficient of the intraclass correlation has been calculated (Zieliński P., p.250):

$$ICC = \frac{\hat{\sigma}^2_{consumer}}{\hat{\sigma}^2_{consumer} + \hat{\sigma}^2_0} = \frac{0{,}207577}{0{,}207577 + 1{,}410845} = 0{,}128259 \qquad (2)$$

The result of 0.13 has been obtained. It means that approximately 13% of the total variance of the offer assessment in the context of the COO dimensions results from the variability among the respondents.

H1: The COO dimensions influence the assessment of offers (products and services)

To verify the abovementioned hypothesis, the parameters of Model 1 have been assessed, including one variable: *the COO dimension.*

$$O_{ij} = \alpha_0 + \alpha_1 div_{ij} + \alpha_2 in_{ij} + \alpha_3 qual_{ij} + b_{0j} + \varepsilon_{ij} \qquad (j = 1,...,192) \qquad (3)$$

div_{ij}, in_{ij}, $qual_{ij}$ - the variables 0-1 which take the value 1 when the j-th person subsequently assesses Diversity, Innovativeness, Quality, and the variable which in other case takes value 0 (when the j-the person assesses Prestige).

Table 3. Estimates of fixed effects and covariance parameters for model 1.

Model 1[a]				
Estimates of Fixed effects				
Parameter	estimate	Std. error	T [Wald z for cov. param.]	p
Intercept	4,141394	,043622	94,939	,000
Diversity	-,031965	,040477	-,790	,430
Innovativeness	-,107263	,040516	-2,647	,008
Quality	-,063844	,040477	-1,577	,115
Prestige	0[b]	0		
Estimates of covariance parameters				
residual $\hat{\sigma}_0^2$	1,409244	,024353	57,867	,000
Intercept [subject=person id] Variance $\hat{\sigma}^2_{consumer}$	,207537	,025195	8,237	,000

[a.] Dependent variable: products' and services' evaluation

[b.] This parameter is set to zero because it is redundant.

The estimation of the parameters considering the Diversity, Innovativeness and Quality variables (Table 3) indicates how much lower the assessment of the offer becomes with regard to these dimensions, in comparison to the assessment of the offer in terms of Prestige. It can be observed that the offer has obtained the highest assessment in terms of Prestige, then subsequently in terms of Diversity, Quality and the lowest assessment in terms of Innovativeness. However, the difference in the relation to Prestige was significant only in the case of Innovativeness (p=.008).

Table 4. Tests of fixed effect for the model 1. Degrees of freedom, F and p values for the factors included in the generalized linear mixed model I used to analyze the evaluation of products and services

Effect	Num df	Den df	F	p
Intercept	1	192,088	13015,908	,000
COO's dimension	3	6698,524	2,557	,053

Dependant variable: products' and services' evaluation

The result of the test (Type III test of fixed effect) (Table 4) indicates that the COO effect dimension reaches the limits of statistical significance (p=0,053). In order to provide an in-depth analysis, the impact of the effect has been calculated in accordance with the following equation (Zieliński P., s.251):

$$R_1^2 = \frac{\hat{\sigma}^2_{0\ model\ bazowy} - \hat{\sigma}^2_{0\ model\ oceniany}}{\hat{\sigma}^2_{0\ model\ bazowy}} = \frac{1{,}410845 - 1{,}409244}{1{,}410845} = 0{,}001135 \quad (4)$$

The obtained result is 0,0011 which indicates that the model in which the assessment of the offer depends linearly on the COO dimension, explains only 0,11% of intrapersonal variability of results.

H2: The COO dimensions affect assessment of offers (products and services). The respondents coming from various countries are different in terms of provided assessments.

In order to verify the H2 in the subsequent step, a variable of *the consumer's origin country* has been added to the model. It has been introduced to check if, and to what extent, the variable explains the interpersonal variance. The following tables (Tables 5 and 6) present the results obtained for Model 2. The theoretical form of that model takes the following form:

$$O_{ij} = \alpha_0 + \alpha_1 div_{ij} + \alpha_2 in_{ij} + \alpha_3 qual_{ij} + \beta_1 Lit_{ij} + b_{0j} + \varepsilon_{ij} \quad (j = 1,...,192) \tag{5}$$

where:

Lit_{ij} - the variable 0-1 which takes value 1 when the j-th person comes from Lithuania, and the variable which in other case takes value 0 (when the j-the person comes from Poland).

Table 5. Tests of fixed effects for the model 2.Degrees of freedom, F and p values for the factors included in the generalized linear mixed model II used to analyze the evaluation of products and services

Effect	Num df	Den df	F	p
Intercept	1	192,287	12317,922	,000
COO's dimension	3	6698,579	2,560	,053
Consumer's origin	1	192,287	7,695	,006

Dependant variable: products' and services' evaluation

The results indicate (Table 5) that the variable *the COO dimension* (F=2,56; p=.053) and the *consumer's origin country* (F=7, 695; p=.006) significantly affect the assessment of products and services. However, the analysis indicates that the variable *consumer's origin country* distinguishes the assessments of the offer more than the variable *the COO dimension* of the offer.

Table 6. Estimates of fixed effects and covariance parameters for model 2.

Model 2[a]				
Estimates of Fixed effects				
Parameter	estimate	Std. error	T [Wald z for cov. param.]	p
Intercept	4,071764	,049834	81,706	,000
Diversity	-,032120	,040477	-,794	,428
Innovativeness	-,107344	,040516	-2,649	,008
Quality	-,063977	,040477	-1,581	,114
Prestige	0[b]	0	.	.
Consumer's origin = Lithuania	,206156	,074315	2,774	,006
Consumer's origin = Poland	0[b]	0	.	.
Estimates of covariance parameters				
residual $\hat{\sigma}_0^2$	1,409243	,024353	57,867	,000
Intercept [subject=person id] Variance $\hat{\sigma}^2_{consumer}$	,198032	,024225	8,175	,000

a. Dependent variable: products' and services' evaluation.

b. This parameter is set to zero because it is redundant.

The results indicate (Table 6) that the consumers coming from Lithuania provide assessments which are higher by 0,206 point in comparison to the assessments provided by the Polish consumers. The difference proves to be statistically significant (p=.006).

In order to provide an in-depth analysis, the impact of the interpersonal effect has been analyzed and calculated in accordance with the following equation:

$$R_1^2 = \frac{\hat{\sigma}^2_{consumer,basic\,model} - \hat{\sigma}^2_{consumer,evaluated\,model}}{\hat{\sigma}^2_{consumer,basic\,model}} = \frac{0{,}207537 - 0{,}198032}{0{,}207537} = 0{,}045799 \qquad (6)$$

In the model obtained in that way, the interpersonal variance of error has been decreased. The impact of the effect has reached the level of 0,046, which means that approximately 4.6% of the interpersonal variance of results can be explained by the consumer's origin country. In comparison to Model 1, the residual variance has not changed, which seems natural due to the fact that the interpersonal variance should not affect the intrapersonal variance.

H3: The COO dimensions affect assessment of offers (products and services). Respondents coming from various countries are different in terms of the provided assessments in respect of the particular COO dimensions.

Next, it has been decided to investigate if there is any interaction between the variable *the COO dimension* and *the consumer's origin country*. In order to achieve this aim, the parameters of the following model have been estimated:

$$E_{ij} = \alpha_0 + \alpha_1 div_{ij} + \alpha_2 in_{ij} + \alpha_3 qual_{ij} + \beta_1 Lit_{ij} + \gamma_1 Lit_{ij} div_{ij} + \gamma_2 Lit_{ij} in_{ij} + \gamma_3 Lit_{ij} qual_{ij} + b_{0j} + \varepsilon_{ij} \quad (j = 1,...,192) \quad (7)$$

Table 7.Tests of fixed effects for the model 3. Degrees of freedom, F and p values for the factors included in the generalized linear mixed model III used to analyze the evaluation of products and services

Effect	Num df	Den df	F	p
Intercept	1	192,289	12318,533	,000
COO's dimension	3	6699,975	2,372	,068
Consumer's origin	1	192,289	7,687	,006
COO's x consumer's origin	3	6699,975	1,027	,379

Dependent variable: products' and services' evaluation

The interaction between the COO dimension and the consumer's country of origin has proved to be statistically insignificant (p=.379, see Table 7). It means that there is no complex influence of both variables on the assessment of products and services.

Table 8. Estimates of fixed effects and covariance parameters for model 3.

Model 3[a]				
Estimates of Fixed effects				
Parameter	Estimate	Std. error	T [Wald z for cov. param.]	p
Intercept	4,078088	,052847	77,168	,000
Diversity	-,029045	,049668	-,585	,559
Innovativeness	-,098829	,049668	-1,990	,047
Quality	-,100835	,049657	-2,031	,042
Prestige	0[b]	0	.	.
[consumer's origin=Lithuania]	,187225	,091100	2,055	,040
[consumer's origin=Poland]	0[b]	0	.	.
[COO's dimension=Diversity] * [consumer's origin=Lithuania]	-,008842	,085666	-,103	,918
[COO's dimension=Diversity] * [consumer's origin=Poland]	0[b]	0	.	.
[COO's dimension=Innovativeness] * [consumer's origin=Lithuania]	-,025257	,085829	-,294	,769

[COO's dimension =Innovativeness] * [consumer's origin=Poland]	0[b]	0	.	.
[COO's dimension =Quality] * [consumer's origin=Lithuania]	,109336	,085684	1,276	,202
[COO's dimension =Quality] * [consumer's origin=Poland]	0[b]	0	.	.
[COO's dimension =Prestige] * [consumer's origin=Lithuania]	0[b]	0	.	.
[COO's dimension=Prestige] * [consumer's origin=Poland]	0[b]	0	.	.
Estimates of covariance parameters				
residual $\hat{\sigma}_0^2$	1,408598	,024342	57,867	,000
Intercept [subject=person id] Variance $\hat{\sigma}^2_{consumer}$	,198031	,024223	8,175	,000

[a.] Dependent variable: products' and services' evaluation.

[b.] This parameter is set to zero because it is redundant.

Based on the results presented in Table 8, it is possible to observe that there are statistically significant differences in the assessments of the offer in respect of Quality and Prestige among the Polish consumers. Additionally, the assessments provided by the Lithuanian consumers are significantly higher that the assessments provided by Polish consumers. All the analysed interactions have proved statistically insignificant. In order to facilitate the interpretation of the obtained results in the Appendix 1, a table with the interpretation of the parameters characterising Model 3 has been provided.

Subsequently, in order to verify if the models presented in the research differ significantly from each other, the difference test of log likelihood ratio has been used, allowing the authors to estimate whether the subsequent model is better than the previous one (Grabowski, 20p.31):

$$LRT = -2\ln L_b - (-2\ln L_t) \sim \chi^2_{df} \tag{8}$$

where:

L_t *-the value of the likelihood function of the tested model*

L_b *-the value of the likelihood function of the benchmark model*

df *-the degrees of freedom determined as the difference between the number of parameters in the tested model and the benchmark model.*

The log likelihood ratio takes positive values of statistical distribution $\chi^2_{df=D_t-D_b}$. The null hypothesis, which has been verified with the statistics of that test, assumes that the basic model is a better model. The high values of statistics resulting from significant differences in the values of the abovementioned logarithms lead to the rejection of the null hypothesis. Nested models are the only ones which can be compared in such a way and estimated with the use of the maximum likelihood method.

Table 9. The differences in fitting subsequent models

Model	df	-2 log likelihood	Test	LRT	p
Model 0	-	22273,954			
Model 1	3	22266,286	0 vs. 1	7,668	0,053
Model 2	1	22258,741	1 vs. 2	7,545	0,006
Model 3	3	22255,661	2 vs. 3	3,08	0,379

The test of statistical significance of differences in fitting subsequent models indicates that Model 1 differs in its fitting at the limit of statistical significance (p=0,053) from Model 0. Thus, with some precaution, it is possible to state that Model 1 is better fitted to the data than Model 0. Model 2 is better fitted to the data in a statistically significant way than Model 1 (p=0,006). The reduction of the lack-of-fit for Model 3 in comparison to Model 2 is insignificant (p=0,379).

Summary

Based on the conducted analysis, it has been possible to explain 0,11% of intrapersonal variability of assessments referring to European services and products which results from the COO dimension (Model 1). It means that the differentiation of assessment in respect of the particular dimensions is insignificant for the particular consumers. Therefore, it is possible to assume that a particular product or service is perceived by a particular consumer as relatively homogenous in terms of quality, diversity, innovativeness and prestige. Additionally, it has been determined that 4.6% of interpersonal variability of the offer assessment may be explained by the consumer's origin country (Model 2). Thus, both effects have proved to be significant, however the COO dimensions and consumer's origin have contributed to the explanation of variability to a very little extent.

It is worth noticing that although the interaction effect between the variables (Model 3) has proved insignificant, at the same time some results have appeared, allowing the authors to draw further interesting conclusions, namely: the assessments referring to the prestige of an offer provided by the Poles significantly differ from the assessments of innovativeness and quality; they do not differ significantly from the assessments of diversity. The Poles assess services higher as far as the prestige is concerned, then diversity, innovativeness and the lowest assessments refer to the quality dimension. The insignificance of the interaction suggests that even if there are some differences in the COO dimensions between the consumers from Poland and from Lithuania, the size of those differences is similar for the Poles and the Lithuanians. It means that

although the introduction of the consumer's origin country insignificantly affects the explanation of the assessments referring to the offer, the consideration of all the consumers as a homogenous set results in the diluting of the COO dimension effect. Nevertheless, the differentiation of the assessments provided by the Poles and the Lithuanians (who tend to provide higher assessments) has allowed the authors to discover that the COO dimensions differ among themselves to a higher extent than it has been suggested in Model 1.

Conslusions

The aim of the research was to verify whether the COO effect displays a multi-dimensional character. It has been verified by testing the hypothesis concerning various kind of influence exerted by the particular dimensions on the assessment of European products and services in international comparisons. Although, obtained results have reached the level close to statistical significance, it has been indicated that the assessment of products and services is differentiated, depending on the assumed COO dimensions.

Interactive influence among the COO dimensions and the consumer's origin country has proved to be insignificant. However, some additional results have been obtained which allow the authors to indirectly conclude on the multi-dimensional nature of the COO. It has turned out that Poles assess European products and services in the highest way, in terms of prestige, diversity, innovativeness and quality, which is assessed at the lowest level. Quality is the highest rated dimension by Lithuanians, before prestige, diversity and innovativeness which is the lowest rated dimension. The results indicate differentiation in terms of the COO dimensions among consumers of different origin; it comes as a confirmation of the conclusions about multidimensionality of COO drawn from the previous research (Boguszewicz-Kreft, Magier-Łakomy, Sokołowska, 2015; Magier-Łakomy, Boguszewicz-Kreft, 2015). At the same time, the results indicate that international comparisons of the multi-dimensional character of the COO are well justified.

Some limitations of the given study has occurred. The respondents to the presented research were students. Undoubtedly, students are also consumers, and the number of their trips abroad, noted down in the research, has been surprisingly high, indicating the experience obtained in foreign markets, however the generalisation of the results may be biased. Any possible research bias resulting from disproportions between the number of the compared groups from Poland and Lithuania have been decreased to a certain extent, due to the application of relevant statistical methods.

In the subsequent articles the authors intend to investigate a following problem: will the introduction of the COO effect of the assessed products and services differentiate the assessment more than the consumer's origin country? And also: are there any differences in the assessment of the particular types of services which come from various European countries?

Appendix 1. Interpretation of the parameters of Model 3

The symbol of the parameter	Description
α_0	Average assessment of Prestige provided by the Polish consumers
$\alpha_0 + \alpha_1$	Average assessment of Diversity provided by the Polish consumers
$\alpha_0 + \alpha_2$	Average assessment of Innovativeness provided by the Polish consumers
$\alpha_0 + \alpha_3$	Average assessment of Quality provided by the Polish consumers
$\alpha_1, \alpha_2, \alpha_3$	The difference obtained respectively between: Diversity and Prestige, Innovativeness and Prestige, Quality and Prestige for the Polish consumers.
$\alpha_0 + \beta_1$	Average assessment of Prestige provided by the Lithuanian consumers
$\alpha_0 + \alpha_1 + \beta_1 + \gamma_1$	Average assessment of Diversity provided by the Lithuanian consumers
$\alpha_0 + \alpha_2 + \beta_1 + \gamma_2$	Average assessment of Innovativeness provided by the Lithuanian consumers
$\alpha_0 + \alpha_3 + \beta_1 + \gamma_3$	Average assessment of Quality provided by the Lithuanian consumers
$\alpha_1 + \gamma_1, \alpha_2 + \gamma_2, \alpha_3 + \gamma_3$	The difference obtained respectively between: Diversity and Prestige, Innovativeness and Prestige, Quality and Prestige for the Lithuanian consumers.
$\gamma_1, \gamma_2, \gamma_3$	The extent by which the difference is bigger between the subsequent dimensions: diversity and prestige, innovativeness and prestige, quality and prestige for the Lithuanian consumers in comparison to the Polish consumers. The differences have proved to be insignificant.

Reference

Ahmed, Z. U., Johnson, J. I., Ling, C. K, Fang, T. W., & Nui, A. K. (2002). Country-of- origin and brand effects on consumers' evaluations of cruise lines. *International Marketing Review, 19*(3), 279-302.

Al-Sulaiti, K. I., & Baker, M. J. (1998). Country of origin effects: a literature review. *Marketing Intelligence & Planning*, *16*(3), 150-199.

Balabanis, G., & Diamantopoulos, A. (2008). Brand Origin Identification by Consumers: A Classification Perspective. *Journal Of International Marketing*, *16*(1), 39-71. doi:10.1509/jimk.16.1.39.

Balabanis, G., & Diamantopoulos, A. (2011). Gains and Losses from the Misperception of Brand Origin: The Role of Brand Strength and Country-of-Origin Image. *Journal of International Marketing, 19*(2), 95-116.

Berentzen, J. B., Backhaus, C., Michaelis, M., Blut, M., & Ahlert, D. (2008). Does "Made in . . ." Also Apply to Services? An Empirical Assessment of the Country-of-Origin Effect in Service Settings. *Journal Of Relationship Marketing*, *7*(4), 391-405. doi:10.1080/15332660802508364.

Biecek P. (2013). Analiza danych z programem R. Modele liniowe z efektami stałymi, losowymi i mieszanymi, Wydawnictwo Naukowe PWN.

Bikely, W.J. & Nes, E. (1982). Country of Origin Effects on Product Evaluations, *Journal of International Business Studies, 1*(3), 131-141.

Boguszewicz-Kreft, M. (2014). Efekt kraju pochodzenia w usługach. (Country-of-origin effect in services) W: *Sektor usług – uwarunkowania i tendencje rozwoju, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu Nr 353*, 79-89.

Boguszewicz-Kreft M., Magier-Łakomy E., Sokołowska K. (2015). The Country-of-Origin Effect in the Selected Transport Services, Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 875, Problemy zarządzania, finansów i marketingu nr 41, pt. Zachowania współczesnych konsumentów i rozwój zarządzania marketingowego organizacją, vol. 2, 23-34.

Bose, S., & Ponnam, A. (2011). Country of origin effect on services: an evaluation of entertainment. *Managing Leisure Vol. 16*(2), 98–107.

Bruning, E., & Saqib, N. U. (2013). Cultural Similarity and National Bias: An Assessment in an International Service Context. *Journal Of Global Marketing*, *26*(1), 41-56. doi:10.1080/08911762.2013.779407.

Chattalas, M., Kramer, T., & Takada, H. (2008). The impact of national stereotypes on the country of origin effect: A conceptual framework. *International Marketing Review*, *25*(1), 54-74. doi:10.1108/0265133081085881.

d'Astous, A., Giraud Voss, Z., Colbert, F., Carù, A., Caldwell, M., & Courvoisier, F. (2008). Product-country images in the arts: a multi-country study. *International Marketing Review*, *25*(4), 379-403. doi:10.1108/02651330810887459.

Eurostat (2013), European Commission, July. Retrieved November 5, 2013, from http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_trade_in_services

Figiel, A. (2004), Etnocentryzm konsumencki. Produkty krajowe czy zagraniczne, PWE, Warszawa.

Grabowski P. (2015). Modele mieszane z wykorzystaniem języka programowania SAS. Retrieved 08.02.2016 from http://www.mif.pg.gda.pl/homepages/kdz/StatystykaII/modelemieszane.pdf.

Harrison-Walker, L. J. (1995). The relative effects of national stereotype and advertising information on the selection of a service provider: an empirical study. *Journal Of Services Marketing*, *9*(1), 47-59.

Hong, S., & Wyer, R. J. (1989). Effects of country-of-origin and product-attribute information on product evaluation: an information processing perspective. *Journal Of Consumer Research*, *16*(2), 175-187.

Javalgi, R.G., Cutler, B.D., & Winans, W. (2001). At your service! Does country of origin research apply to services. *Journal of Services Marketing*, *15*(6/7), 565-582.

Khare, V. P., & Popovich, K. (2010). Country Of Origin Of Services: Are All Services Created Equal?. *Summer Internet Proceedings*, *12,* 113-116.

Lianxi, Z., Zhiyong, Y., & Hui, M. K. (2010). Non-local or local brands? A multi-level investigation into confidence in brand origin identification and its strategic implications. *Journal Of The Academy Of Marketing Science*, *38*(2), 202-218. doi:10.1007/s11747-009-0153-1.

Lee, J. A., Garbarino, E. & Lerman, D. (2007). How cultural differences in uncertainty avoidance affect product perceptions. *International Marketing Review, 24* (3), 330–349.

Magier-Łakomy E., Boguszewicz-Kreft M. (2015). Dimensions of the Country of Origin Effect and their Measurement, Annales UMCS, Sectio H Oeconomia 3, 125-134.

Martín Martín, O., & Cerviño, J. (2011). Towards an integrative framework of brand country of origin recognition determinants: A cross-classified hierarchical model. *International Marketing Review*, *28*(6), 530-558.

Melnyk, V., Klein, K., & Vlckner, F. (2012). The Double-Edged Sword of Foreign Brand Names for Companies from Emerging Countries. *Journal Of Marketing*, *76*(6), 21-37.

Michaelis, M., Woisetschläger, D. M., Backhaus, C., & Ahlert, D. (2008). The effects of country of origin and corporate reputation on initial trust. *International Marketing Review*, *25*(4), 404-422. doi:10.1108/02651330810887468

Morrish, S. C., & Lee, C. (2011). Country of origin as a source of sustainable competitive advantage: the case for international higher education institutions in New Zealand. *Journal Of Strategic Marketing*, *19*(6), 517-529. doi:10.1080/0965254X.2011.599497.

Narayana, C. L. (1981). Aggregate Images of American and Japanese Products: Implications on International Marketing. *Columbia Journal Of World Business*, *16*(2), 31-35.

Nagashima, A. (1970). A Comparison of Japanese and U.S. Attitudes Toward Foreign Products. *Journal Of Marketing*, *34*(1), 68-74.

Nicolescu L. (2012). The analysis of conceptual tools for the study of country of origin effect for hybrid offerings. *Management & Marketing, 2012, 7*(1), 7.

Paswan, A. K., & Sharma, D. (2004). Brand-country of origin (COO) knowledge and COO image: investigation in an emerging franchise market. *Journal Of Product & Brand Management*, *13*(3), 144-155. doi:10.1108/10610420410538041.

Peterson, R.A., & Jolibert, A.J.P. (1995). A meta-analysis of country-of-origin effects. *Journal of International Business Studies, 26*(4), 83-101.

Pharr, J.M. (2005). Synthesizing Country-of-Origin Research from the Last Decade: Is the Concept Still Salient in an Era of Global Brands? *Journal of Marketing Theory & Practice, 13*(4), 34-44.

Radkiewicz P., Zieliński M. W. (2010). Hierarchiczne modele liniowe. Co nam dają i kiedy warto je stosować, w: Psychologia Społeczna, tom 5 2–3 (14) 217–233, ISSN 1896-1800.

Rezvani, S., Dehkordi, G.J., Rahman, M.S., Fouladivanda, F., Habibi, M., & Eghtebasi, S. (2012). A conceptual study on the Country of Origin Effect on consumer purchase intention. *Asian Social Science, 8*(12), 205-215.

Roth, M. S., & Romeo, J. B. (1992). Matching Product Category And Country Image Perceptions: A Framework For Managing Country-Of-Origin Effects. *Journal Of International Business Studies*, *23*(3), 477-497.

Saran, R., & Gupta, N. (2012). Country of Origin Vs. Consumer Perception: A Literature Review. *IUP Journal Of Marketing Management*, *11*(4), 66-75.

Schooler, R.D. (1965). Product bias in the Central American Common Market, *Journal of Marketing Research, 11*, 394-397.

Sikora, T. (2008). Znaczenie efektu kraju pochodzenia dla komunikacji w biznesie międzynarodowym, Zeszyty Naukowe SGH Nr 23. Retrieved July,10, 2013 from, Zeszyty_Naukowe_SGH-2008-13-23-173-194.pdf.

Sharma, P. (2011). Demystifying Cultural Differences in Country-of-Origin Effects: Exploring the Moderating Roles of Product Type, Consumption Context, and Involvement. *Journal of International Consumer Marketing, 23*, 344–364.

Sharma, P., Mathur, R., & Dhawan, A. (2009). Exploring customer reactions to offshore call centers: toward a comprehensive conceptual framework. *Journal Of Services Marketing*, *23*(5), 289-300. doi:10.1108/08876040910973404.

Wong, K. A., & Folkes, V. (2008). Country-of-Origin Effects on Consumers' Attributions and Word-of-Mouth Communications about Services. *Advances In Consumer Research*, *35,*1029-1032.

Zieliński P. (2010). Schemat powtarzanych pomiarów w ujęciu analizy wielopoziomowej – hierarchiczny model liniowy jako alternatywa dla analizy wariancji z powtarzanym pomiarem, w: Psychologia Społeczna, tom 5 2–3 (14) 234–259, ISSN 1896-1800.