SCHEIN, E. H. 1985. Coming to a New Awareness of Organizational Culture. In: Sloan Management Review, vol. 25, 1984, no. 2, p. 3–16.

SCHEIN, E. H. 1985. Organization Culture and Leadership: A Dynamic View. San Francisco : Jossey – Bass, 1985.

SCHEIN, E. H. 1992. Organizational Culture and Leadership. San Francisco : Jossey – Bass, 1992.

SENGE, P. 1994. The Fifth Discipline : The Art and Practice of Learning Organization. New York : Doubleday Business, 1994. 424 p. ISBN 13: 978-0385260954.

SINHA, S. et al. 2010a. Impact of Work Culture on Motivation Level of Employees in Selected Public Sector Companies in India. In: Delhi Business Review, vol. 11, 2010, no. 1, p. 43 – 54.

SINHA, S. et al. 2010b. Impact of Work Culture on Motivation and Performance Level of Employees in Private Sector Companies. In: Acta Oeconomica Pragensia, vol. 18, 2010, no. 6, p. 49 – 67.

TAKADA, P. W. – WESTBROOK, J. W. 2009. The Impact of Organization Culture on Satisfaction of Engineers in Technology. [online]. Huntsville : University of Alabama, 2009, [cit. 2009-02-27]. http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20020017756_2002010173.pdf.

VERMA, R. 2009. Managing Attitudinal Changes Through OB Mechanism : With Reference To Selected Public and Private Sector Banks. [Unpublished thesis]. Delhi : Dept. of Commerce University of Delhi, 2009, p. 208 – 209.

WRIGHT, B. E. 2004. The Role of Work Context in Work Motivation : A Public Sector Application of Goal and Social Cognitive Theories. In: Journal of Public Administration Research & Theory, vol. 14, 2004, no. 1, p. 59 – 78.

YEUNG, A. K. et al. 1999. Organizational Learning Capability – Generating and Generalizing Ideas with Impact. New York : Oxford University Press, 1999.

Contact address:
Smrita Sinha, Amity Business School, Amity University, Noida; Ajay Kumar Singh, Nisha Gupta, Department of Commerce, Delhi School of Economics, University of Delhi, Delhi; Rajul Dutt, Department of Management Studies, J. P. School of Business, Meerut

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GRAVITY MODEL OF EU'S BILATERAL TRADE WITH DIFFERENT PRODUCTS

GRAVITAČNÝ MODEL BILATERÁLNEHO OBCHODU EÚ S RÔZNYMI TOVARMI

Ján POKRIVČÁK, Kristína ŠINDLEROVÁ

Slovak University of Agriculture in Nitra, Slovak Republic

The basic gravity model of the bilateral trade supposes that the rich and geographically closely situated countries trade more. We have used the enlarged gravity models to explore the effect of other factors on the EU's bilateral trade. The aim of the article is to analyse the bilateral trade of the EU member states with third countries, and identify the factors which affect the trade with different products during the term 2004 – 2008. The impact of the common border, language, colonial history, and variety of trade agreements on the trade with commodities 02 – dairy products, birds' eggs, honey and 04 – meat and edible meat offal is studied in the article.

Key words: gravity model, bilateral trade, commodity 02, commodity 04

The European Union is one of the leading exporters and importers of the manufactured goods and services. Its biggest trading partners are the United States, China and Russia. The 17.9% of imports flow from China and 13.3% from the USA. The most of EU's products are exported to the USA (18.7%), Switzerland (8.1%) and China (7.5%). The agricultural products represent 8% of imports and 7% of total exports from the EU.

The amounts of flows and products of bilateral trade with third countries are influenced by different factors. Besides the historical, cultural and language proximity, the various forms of preferential agreements also have important role.

Material and methods

In order to analyse the bilateral trade with third countries and to identify the factors which influence the trade we use the basic gravity model (Gani, 2010; Head, 2003):

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(POP_i) + \beta_4 \ln(POP_j) + \beta_5 \ln(DIST_{ij}) + \varepsilon \quad (1)$$

The basic gravity model is modified by introducing the dummy variables – $CONT_{ij}$, $LANG_{ij}$, COL_{ij}, EPA_{ij}:

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(POP_i) + \beta_4 \ln(POP_j) + \beta_5 \ln(DIST_{ij}) + \beta_6 CONT_{ij} + \varepsilon \quad (2)$$

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(POP_i) + \beta_4 \ln(POP_j) + \beta_5 \ln(DIST_{ij}) + \beta_6 CONT_{ij} + \beta_7 LANG_{ij} + \varepsilon \quad (3)$$

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(POP_i) + \beta_4 \ln(POP_j) + \beta_5 \ln(DIST_{ij}) + \beta_6 CONT_{ij} + \beta_7 LANG_{ij} + \beta_8 COL_{ij} + \varepsilon \quad (4)$$

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(POP_i) + \beta_4 \ln(POP_j) + \beta_5 \ln(DIST_{ij}) + \beta_6 CONT_{ij} + \beta_7 LANG_{ij} + \beta_8 COL_{ij} + \beta_9 EPA_{ij} + \varepsilon \quad (5)$$

where:
i – EU member state
j – partner country
X_{ij} – trade flows between countries i and j (EX_{ij} – export from country i to country j, IM_{ij} – import from country j to i)
GDP_i, GDP_j – gross domestic product of country i and country j
POP_i, POP_j – population of countries i and j
$DIST_{ij}$ – distance between countries i and j
$CONT_{ij}$ – common border between countries i and j
$LANG_{ij}$ – common language of countries i and j
COL_{ij} – common colonial history of countries i and j
EPA_{ij} – preferential trade agreement with EU
ε – error term
$\beta_1 - \beta_9$ – coefficients
β_0 – constant

The gravity model is based on the assumption that the economically rich and geographically close countries trade more together than with third countries. The augmented gravity model shows the influence of the dummy variables: common border, language, colonial history, and preferential access to the EU market.

Common colonial history and common border should facilitate commercial relations and increase bilateral flow of products between countries. The variables get the value of 1, if the mentioned relationship exists between partner countries, and 0 if not. If official or national language is the same in both partner countries, or the same language is used by at least 20% of population in the country i and j, then the variable – common language has the value 1, otherwise 0.

The preferential access to the EU market makes the trade to flow more easily and in bigger amounts. The variable EPA presents the different levels of openness of mutual trade relations (free trade agreement, custom union, European partnership agreement) and has value 1, if the partner countries have signed the particular trade agreement. If countries are not in the particular trade relationship, the value of variable is zero.

Annex 1 Trade partners of EU member states

Afghanistan	Botswana	Croatia	Guinea	Libya	Niger	San Marino	Trinidad and Tobago
Albania	Br. Virgin Islands	Cuba	Guinea-Bissau	Madagascar	Nigeria	Sao Tome and Principe	Turkmenistan
Algeria	Brazil	Dem. Rep. of the Congo	Guyana	Malawi	Norway*	Saudi Arabia	Turks and Caicos Islands
Andorra	Brunei Darussalam	Dem. People's Rep. of Korea	Haiti	Malaysia	Occ. Palestinian. Terr.	Senegal	Tuvalu
Angola	Burkina Faso	Djibouti	Honduras	Maldives	Oman	Serbia	Uganda
Anguilla	Burundi	Dominica	Iceland	Mali	Pakistan	Seychelles	Ukraine
Antigua and Barbuda	Cambodia	Dominican Republic	India	Marshall Islands	Palau	Sierra Leone	United Arab Emirates
Argentina	Cameroon	Ecuador	Indonesia	Mauritania	Panama	Singapore	United Rep. of Tanzania
Armenia	Canada	Egypt. Arab Rep.	Iran. Islamic Rep.	Mauritius	Papua New Guinea	Solomon Islands	Uruguay
Aruba	Cape Verde	El Salvador	Iraq	Mexico	Paraguay	Somalia	USA**
Australia	Cayman Islands	Equatorial Guinea	Israel	Mongolia	Peru	South Africa	Uzbekistan
Azerbaijan	Central African Republic	Eritrea	Jamaica	Montenegro	Philippines	Sri Lanka	Vanuatu
Bahamas	Chad	Ethiopia	Japan	Montserrat	Tunisia	Sudan	Venezuela. RB
Bahrain	Chile	Fiji	Jordan	Morocco	Turkey	Suriname	Vietnam
Bangladesh	China	French Polynesia	Kazakhstan	Mozambique	Qatar	Swaziland	Zambia
Barbados	China. Hong Kong SAR	FS Micronesia	Kenya	Myanmar	Rep. of Korea	Switzerland	Zimbabwe
Belarus	China. Macao SAR	Gabon	Kiribati	Namibia	Rep. of Moldova	Syrian Arab Rep.	Yemen. Republic
Belize	Colombia	Gambia	Kuwait	Nauru	Russian Federation	Tajikistan	
Benin	Comoros	Georgia	Kyrgyz Republic	Nepal	Rwanda	TFYR of Macedonia	
Bermuda	Congo. Rep.	Ghana	Lao PDR	Netherlands Antilles	St Kitts and Newis	Thailand	
Bhutan	Cook Islands	Greenland	Lebanon	New Caledonia	St Lucia	Timor-Leste	
Bolivia	Costa Rica	Grenada	Lesotho	New Zealand	St Vincent and the Grenadines	Togo	
Bosnia and Herzegovina	Cote d'Ivoire	Guatemala	Liberia	Nicaragua	Samoa	Tonga	

*including: Svalbard and Jan Mayen; **including: Puerto Rico, US Virgin Islands
* vrátane Svalbardu a ostrova Jan Mayen; ** vrátane Portorika a Amerických panenských ostrovov

Príloha 1 Obchodní partneri členských štátov EÚ

Results and discussion

The article describes the bilateral trade of EU member states with third countries during the term 2004 – 2008. We focused on the trade with 178 third countries with products of category 02 – meat and edible meat offal and 04 – dairy produce; birds eggs; natural honey according to HS2002 classification. The third countries were selected according to the availability of data in the database UN Comtrade (Annex 1).

Export and import gravity models of EU member states' bilateral trade with third countries

According to the trade intensity indices, the trade flows between EU member states and third countries do not depend exclusively on the GDP of trading partners. The influence of other variables on the bilateral trade flows of EU member states with third countries is identified by the basic and enlarged gravity models (Table 1, 2).

The gravity models 1 – 6 (table 1) show the positive influence of GDP of partner countries on the EU member states' export. If GDP of EU member state increases by 1%, the export increases by at least 1.852%. The effect of GDP of partner country (GDP_j) is lower (1.009 – 1.030%), but also positive.

The impact of population of partner countries is different. The export is negatively related to the number of EU population and positively related to the partner country's population. If the population of EU member state is higher by 1%, the export decreases by 0.276 % (model 3) to 0.338% (model 2). This phenomenon can be explained by absorption effect or by effect of economy of scale (Kien, 2009).

As it was expected, the geographically closer countries trade more, and higher distance between states (calculated by distance between capital cities) decreases the EU export by 1.222% (model 5) – 1.308% (model 3, 4). The variable is statistically significant in all models, which means that there is less than 1% probability that its real value is 0.

The countries with common border, colonial history and language could trade more because of lower transaction costs

Table 1 Gravity models of EU member states' export to third countries

ln *EX* 3rd countries (1)	Model 1	Model 2	Model 3	Model 4	Model 4
ln GDP*i* (2)	1.910***	1.911***	1.854***	1.854***	1.852***
ln GDP*j* (3)	1.026***	1.026***	1.030***	1.029***	1.009***
ln POP*i* (4)	-0.337***	-0.338***	-0.276***	-0.280***	-0.278***
ln POP*j* (5)	0.324***	0.324***	0.328***	0.328***	0.344***
ln DIST (6)	-1.300***	-1.294***	-1.308***	-1.308***	-1.222***
CONT (7)	–	0.194	-0.005	-0.021	0.075
LANG (8)	–	–	0.931***	0.885***	0.880***
COL (9)	–	–	–	0.139	0.133
EPA (10)	–	–	–	–	0.438***
Constant (11)	-47.500***	-47.556***	-47.163***	-47.092***	-47.635***

*** 1% statistical significance, ** 5% statistical significance, * 10% statistical significance (probability that the real effect is zero)
*** 1% štatistická významnosť, ** 5% štatistická významnosť, * 10% štatistická významnosť
Sources: Undata, UN Comtrade, CEPII, own calculations Zdroje: Undata, UN Comtrade, CEPII, vlastné výpočty

Tabuľka 1 Gravitačné modely exportu členských krajín EÚ do tretích krajín
(1) export z EÚ do tretích krajín, (2) ln HDP krajiny *i*, (3) ln HDP krajiny j, (4) ln populácia krajiny *i*, (5) ln populácia krajiny *j*, (6) ln vzdialenosť, (7) spoločná hranica, (8) spoločný jazyk, (9) spoločná koloniálna história, (10) preferenčné obchodné dohody s EÚ, (11) konštanta

Table 2 Gravity models of EU member states' import from third countries

ln *EX* 3rd countries (1)	Model 1	Model 2	Model 3	Model 4	Model 4
ln GDP*i* (2)	1.311***	1.320***	1.250***	1.249***	1.243***
ln GDP*j* (3)	1.292***	1.287***	1.292***	1.290***	1.239***
ln POP*i* (4)	0.601***	0.590***	0.667***	0.649***	0.654***
ln POP*j* (5)	0.400***	0.404***	0.408***	0.408***	0.448***
ln DIST (6)	-0.698***	-0.639***	-0.657***	-0.657***	-0.441***
CONT (7)	–	1.754***	1.510***	1.430***	1.669***
LANG (8)	–	–	1.143***	0.915***	0.904***
COL (9)	–	–	–	0.687***	0.673***
EPA (10)	–	–	–	–	1.097***
Constant (11)	-60.618***	-61.129***	-60.646***	-60.295***	-61.655***

*** 1% statistical significance, ** 5% statistical significance, * 10% statistical significance (probability that the real effect is zero)
*** 1% štatistická významnosť, ** 5% štatistická významnosť, * 10% štatistická významnosť
Sources: Undata, UN Comtrade, CEPII, own calculations Zdroje: Undata, UN Comtrade, CEPII, vlastné výpočty

Tabuľka 2 Gravitačné modely importu členských krajín EÚ z tretích krajín
(1) export z EÚ do tretích krajín, (2) ln HDP krajiny *i*, (3) ln HDP krajiny j, (4) ln populácia krajiny *i*, (5) ln populácia krajiny *j*, (6) ln vzdialenosť, (7) spoločná hranica, (8) spoločný jazyk, (9) spoločná koloniálna história, (10) preferenčné obchodné dohody s EÚ, (11) konštanta

(Andersen and van Wincoop, 2003). According to our study, the export of EU member states (country *i*) is positively related to the common language. If the trading partners use the same language, then the EU member states' export is 141.15% ($e^{0.880} - 1 = 1.4115$) – 153.61% higher. The colonial history and common border do not generally play statistically important role. The EU preferential agreements are positively related to the export to third countries.

The basic and enlarged import gravity models (table 2) demonstrate the similar influence of GDP, as in the export gravity models. The population of both trading partners is positively related to import and is statistically significant. The population of partner country affect less the import that the EU population, but its effect is bigger in comparison to the export. The influence of distance between capital cities of trading partners is negative and lower than in case of export. If the distance is longer by 1%, then the import to EU member states cuts down by 0.441 – 0.698% according to used model.

The common border, language, colonial history and preferential trade agreement are positively related to trade and statistically significant. The trade flow between neighbour countries is higher at least by 317.95%. The common language increases the trade by at least 146.99% and the EU trade agreements by 199.56%.

Gravity models of bilateral trade with products of category 02 and 04

If we study export and import flows of different products, we will find out that the effect of variables is different on the trade with different products (Table 3).

The models show that economically rich countries trade more. The GDP of trading partners is positively related to the trade (sum of export and import), export and import, and is statistically significant in all models. The GDP of exporting country has the higher impact on the trade flow than the partner's GDP (country *i* / country *j* according to model). The increase of GDP*i* by 1% increases the export of products 02 by 1.031% and the import by 0.304%. The GDP*i* has similar effect on the import. The impact of GDPj is only 0.602 – 0.953% on export/import.

The Influence of population is changing in different models. In general the amount of third country's population is negatively related to the trade (export or import). The population of EU member states is positively related to the trade with 02 products, export of products 02 and import of 04.It is statistically insignificant in the rest of models.

The distance is changing according to trade flow which is studied. It is positively related to import and negatively related to export of products of category 02 and 04. In spite of the fact that the negative impact of the distance on the transaction costs was confirmed (Eaton and Kortum, 2001; Hanson, 2004; Porojan, 2001), it does not explain the variability of trade perfectly. If the neighbour countries have ethnic, political or religious problems, or have similar natural resources, the distance could have inverse effect (Vemuri and Sidqi, 2009). This can explain the positive effect of distance on the import of 02 and 04 products.

The neighbour countries have 3 633.18% higher import and 14 844.05% higher export of product 02. The common border increases the import of 04 products by 38 890.42% and export by 808.40%. The major impact of common language is seen in the model of trade with products 04. The dummy variable – colonial history is statistically insignificant in case of import of 04.

The impact of preferential trade agreements was studied by Frankel et al. (1996). Based on our analysis, the bilateral trade with different products is related to different preferential agreements. The gravity models show the positive influence of preferential trade agreements, except the trade (sum of export and import) and export of products 02. This can be explained by nonreciprocal advantages of agreements for third countries

Conclusion

The basic and enlarged gravity models show that trades with meat and edible offal, and dairy products, birds' eggs, honey and other edible animal products are influenced by different factors and by different impact of the same factors. The effect of exporter's and importer's GDP, distance between capital cities

Table 3 Gravity models of EU bilateral trade with third countries with commodities 02 and 04

	Commodity 02 (1)			Commodity 04 (2)		
	trade 02 (3)	export 02	import 02	trade 04 (4)	export 04	import 04
lnGDP*i* (5)	1.064***	1.031***	0.304***	1.725***	1.751***	0.298***
lnGDP*j* (6)	0.980***	0.643***	0.602***	1.047***	0.953***	0.553***
lnPOP*i* (7)	0.218***	0.155***	0.043	-0.011	-0.067	0.096***
lnPOP*j* (8)	-0.268***	-0.210***	-0.129***	-0.096***	-0.103***	-0.077***
lnDIST (9)	-0.532***	-1.386***	0.924***	-1.239***	-1.441***	0.235***
CONT (10)	5.726***	5.007***	3.620***	2.824***	2.207***	5.966***
LANG (11)	1.621***	1.537***	0.213*	2.152***	1.920***	0.918***
COL (12)	2.168***	2.176***	0.801***	1.579***	1.811***	-0.087
EPA (13)	-0.254**	-0.826***	1.081***	0.767***	0.511***	1.000***
Constant (14)	-41.911***	-26.347***	-27.560***	-52.166***	-48.149***	-22.021***

*** 1% statistical significance, ** 5% statistical significance, * 10% statistical significance (probability that the real effect is zero)
*** 1% štatistická významnosť, ** 5% štatistická významnosť, * 10% štatistická významnosť
Sources: Undata, UN Comtrade, CEPII, own calculations Zdroje: Undata, UN Comtrade, CEPII, vlastné výpočty

Tabuľka 3 Gravitačné modely bilaterálneho obchodu členských krajín EÚ s tretími krajinami s tovarmi kategórie 02 a 04
(1) tovar kategórie 02, (2) tovar kategórie 04, (3) obchod s tovarmi kategórie 02, (4) obchod s tovarmi kategórie 04, (5) ln HDP krajiny *i*, (6) ln HDP krajiny *j*, (7) ln populácia krajiny *i*, (8) ln populácia krajiny *j*, (9) ln vzdialenosť, (10) spoločná hranica, (11) spoločný jazyk, (12) spoločná koloniálna história, (13) preferenčné obchodné dohody s EÚ, (14) konštanta

and population of trading countries varies according to models used, trade flow and selected product.

The expectation that the common border and colonial history facilitate the commercial relations and increase the flow of products is not confirmed in the gravity models of total import from third countries. The population does not support the increase of bilateral trade between partners in all models (trade with 04, export of 04, import 02). The impact of other dummy variables changes according to the products traded.

Súhrn

Základný gravitačný model vychádza z predpokladu, že bohaté a geograficky blízke štáty obchodujú navzájom viac. Použili sme rozšírené gravitačné modely na objasnenie vplyvu ostatných faktorov na bilaterálny obchod EÚ. Cieľom článku je analyzovať bilaterálny obchod členských štátov EÚ s tretími krajinami a určiť faktory vplyvu na obchod s rozdielnymi tovarmi v období 2004 – 2008. Článok poukazuje na dopad spoločnej hranice, jazyka, meny, koloniálnej histórie a preferenčných obchodných dohôd na obchodné toky s tovarmi kategórie 02 – mäso a jedlé mäsové droby a 04 – mlieko a mliečne výrobky, vtáčie vajcia, prírodný med, jedlé výroby živočíšneho pôvodu inde nešpecifikované ani nezahrnuté.

Kľúčové slová: gravitačný model, bilaterálny obchod, tovar kategórie 02, tovar kategórie 04

References

ANDERSEN, J. E. – VAN WINCOOP, E. 2003. Gravity with gravitas: a solution to the border puzzle. In: Am. Econ. Rev 93:170–192. In WANG, H. – FIRESTONE, J. 2010. The analysis of country-to-country CDM permit trading using the gravity model in international trade. In: Energy for Sustainable Development, 2003, no. 14, p. 6 – 13.

DISTANCE CEPII (online) (12.10.2010). In: <http://cepii.fr/distance/dist_cepii.zip>.

EATON, J. – KORTUM, S. 2001. International technology diffusion: theory and measurement. In: Int. Econ. Rev 40: 537–570. In WANG, H. – FIRESTONE, J. 2010. The analysis of country-to-country CDM permit trading using the gravity model in international trade. Energy for Sustainable Development, 2001, no. 14, p. 6 – 13.

FRANKEL, J. A. – STEIN, E. – WEI, S. J. 1996. Regional Trading Arrangements: Natural or Supernatural? In: American Economic Review 86(2):52–56. In GLICK, R. – Taylor, A.M. 2010. Collateral damage: Trade disruption and the economic impact of war. In: Review of Economics and Statistics, vol. 92, 1996, no. 1, p. 102 – 127.

GANI, A. 2010. Some Aspects of Trade between Australia and Pacific Island Countries. In: World Economy, vol. 33, 2010, no. 1, p. 89 – 106.

HANSON, G. H. 2004. Market Potential. increasing returns. and geographic concentration. J. In: Int. Econ. 67:1-24. In WANG, H. – FIRESTONE, J. 2010. The analysis of country-to-country CDM permit trading using the gravity model in international trade. In: Energy for Sustainable Development, 2004, no. 14, p. 6 – 13.

HEAD, K. 2003. Gravity for Beginners. Working Paper. 2003, p. 11.

KIEN, N. T. 2009. Gravity Model by Panel Data Approach. In: ASEAN Economic Bulletin, vol. 26, 2009, no. 3, p. 266 – 277.

POROJAN, A. 2001. Trade flows and spatial effects: the gravity model revisited. In: Open Economies Review. 12:265–80. In WANG, H. – FIRESTONE, J. 2010. The analysis of country-to-country CDM permit trading using the gravity model in international trade. In: Energy for Sustainable Development, 2001, no. 14, p. 6 – 13.

TARIC (online). Database of information of EU market entrance (12.10.2010). In: <http://ec.europa.eu/taxation_customs/dds2/taric/taric_consultation.jsp?Lang=sk&redirectionDate=20101202>.

UN COMTRADE (online). Database of trade with commodities UN (10.10.2010). In: <http://comtrade.un.org/db/>.

UNDATA (online). Database (15.10.2010). In: <http://data.un.org/>.

VEMURI, V. K. – SIDDIQI, S. 2009. Impact of Commercialization of the Internet on International Trade: A Panel Study Using the Extended Gravity Model. In: International Trade Journal, vol. 23, 2009, no. 4, p. 458 – 84.

Contact address:
Pokrivčák Ján, professor, Department of Economics, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Slovak Republic, Tr. A. Hlinku 2, 949 76 Nitra, e-mail: jan.pokrivcak@uniag.sk; Šindlerová Kristína, PhD student, Department of Economics, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Slovak Republic, Tr. A. Hlinku 2, 949 76 Nitra, e-mail: kristina.sindlerova@fem.uniag.sk