

BILATERAL ECONOMIC RELATIONS BETWEEN SLOVAKIA AND UKRAINE: MODERN STAGE AND FUTURE TRENDS

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ABSTRACT

Bilateral economic relations between Slovakia and Ukraine can be characterized as dynamical. Among main factors that determine bilateral cooperation are geographical location, common co-existence under Socialistic economic framework, closeness of cultures, languages and mentalities. It is identified that up to 40% of the Slovak export to Ukraine is high-tech commodities along with negative trade balance for Slovakia and import of raw materials from Ukraine.

We ran gravity model to estimate the bilateral trade between Slovakia and Ukraine. The model showed the negative impact of distance on the growth of bilateral trade (both in goods and services). The size of GDP was significant for bilateral trade in goods, where the size of the Ukrainian economy has positive impact on turnover. We think, that this is the illustration of the Slovak exports to Ukraine, where automobiles have the largest share, thus the growing demand for the Slovak goods depends fully on the GDP growth.

Key words: trade turnover, economic cooperation, services, foreign direct investment, national economies, gravity model, macroeconomic balance.

JEL: F10, F40, F50

1. Introduction

Severe economic and financial crisis that Ukraine is undergoing these days requires new theoretical approaches aimed to support bilateral economic relations between Slovakia and Ukraine.

Recent events in 2013-2014 are considered to be the most disastrous in the modern Ukrainian history. Apart from massive protests on Maidan and the

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annexation of The Crimea, Ukraine faces calamitous conflict in the Eastern part of the country (Donetsk and Lugansk oblast’).

This paper addresses the challenges to analyze the modern stage of economic relations between Slovakia and Ukraine, identify future trends of bilateral cooperation and estimate the gravity model of Slovak-Ukrainian trade in the period from 2003 to 2017.

2. Theoretical and Empirical Overview

From the theoretical and empirical point of view, bilateral relations start when two sides have economic advantages. Nowadays this theory is undergoing global transformation and has the great impact of political, social, cultural and civilizational factors.

One of the most suitable model to describe trade relations between Slovakia and Ukraine is gravity model. The model was first used by Tinbergen (1962). The basic model for trade between two countries (*i* and *j*) takes the form of:

$$F_{ij} = G \left(M_i^{\beta_1} M_j^{\beta_2} / D_{ij}^{\beta_3} \right) \quad (1)$$

where *F* is the trade turnover between country *i* and *j*, *M* is the economic size of each country, *D* is the distance between capitals of *i* and *j*, and *G* is a constant.

The linear form of the equation 1 is the following:

$$\ln(F_{ij}) = \beta_0 + \beta_1 \ln(M_i) + \beta_2 \ln(M_j) - \beta_3 \ln(D_{ij}) + \varepsilon_{ij}$$

Despite the difficulties of theoretical estimation of the model, which for a long time engaged world-known economists (Anderson (2003), Krugman (1985), Helpman (1987) gravity equation with different specifications was one of the most stable and reliable empirical regularities in economics and remains relevant today.

In practice, using a variety of modified gravity model with the inclusion of additional explanatory variables depending on the tasks that are specific features of countries and based on earlier studies.

In accordance with the gravity model a geographical location is the engine of trade, labor migration and international investment, in principle any economic interaction between individual economic units. Gravity model is a good tool for forecasting future values of a variable mutual trade.

Concerning Slovak-Ukrainian relations we should mention, that among the Slovak and Ukrainian authors most of the research works are devoted to political, historical, cultural aspects of bilateral relations between Slovakia and Ukraine

Sergienko (2012) presented general review of the Ukrainian-Slovak cooperation. Author is underlying that the evolution of different directions, forms

and types of relations between Ukraine and Slovakia took place under the guidance of targeted countries and ultimately led to the formation of an integrated system of bilateral relations based on good-neighborhood. Besides, it laid the foundations of the strategic Ukrainian-Slovak partnership.

Mandryk (2013) emphasizes that bilateral trade needs wide diversification. Some other research papers focus mainly on historical and political aspects of cooperation between Slovakia and Ukraine.

Marušiak (2013) examines Slovakia's relations with Ukraine through the prism of the Slovak Eastern policy. Author underscores that along with Poland, Slovakia is among those EU members that have promoted the continuation of political dialogue with Ukraine and its EU integration process. In Ukraine, Slovakia is perceived as a successful example of transformation and EU-integration.

3. Genesis of Slovak-Ukrainian economic relations

Both countries after independence have chosen the way of restructuring economy based on market principles, building a new democracy. The main foreign policy priority of both countries was (for the Slovak Republic, received membership) and (for Ukraine) European Integration.

Ukraine was one of the first countries in the world on 1 January, 1993 who recognized the state independence of the Slovak Republic.

Thus, in accordance with the principle of succession, and given appropriate agreement of the parties, today the official date of the establishment of diplomatic relations considered 1 January, 1993 (according to The Embassy of Ukraine in Slovakia official web-site).

Slovakia and Ukraine have always been interested in deep cooperation. In the frame of Euro integration aspirations of Ukraine, Slovakia is becoming stable and predictable partner. The common interest in economic relations is determined by the geographic proximity of Ukraine and Slovakia, closeness of cultures, mentalities, languages and history. The successful experience of the Slovak economic and public reforms, the implementation of mechanisms for split of Czechoslovakia in 1991-1992, the integration process towards NATO and EU accession in 2004 is valuable experience that Ukraine can gain.

In 2007, Slovakia achieved the highest economic growth among the members of the European Union. Annual GDP growth was 10.4% in comparable prices. In 2010, GDP grew in Slovakia by 4.0%, which was the highest growth among the new EU member states.

It should be noted that the State Statistics Service of Ukraine (Ukrstat), publishes publicly summary of Ukraine's foreign trade separately for goods and services. While at the Statistical Administration of the Slovak Republic (SASR)

the publication of such data is not distinguished among trade in goods and services, so the SASR summary data is for goods and services indicators for bilateral foreign trade, balance, exports and imports.

When comparing data of Ukrstat and SASR on the performance of bilateral foreign trade in goods and services between Ukraine and the SR, it should be taken into account the differences in the statistical methods used in Ukraine and the Slovak Republic, and other factors of an objective nature.

The most important objective factor of the difference in aggregate terms is that the State Statistics Service of Ukraine account foreign trade in US dollars and Statistical Administration of Slovakia in EURO.

We collected data starting from 2003 to see the dynamics of bilateral trade in goods after Slovakia joined The EU in 2004 (fig.1).

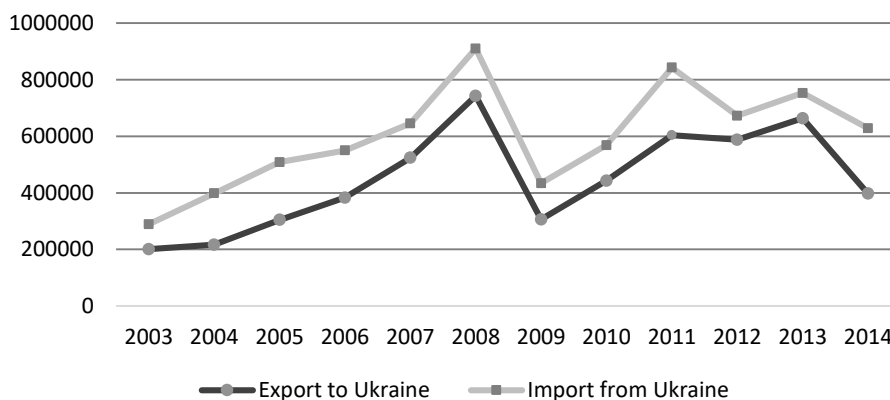


Figure 1. Bilateral trade between Slovakia and Ukraine in goods, ths. USD

Source: Own work.

As we observe from fig. 1 bilateral trade in goods has been fluctuating during the whole period. Its highest level trade in goods reached in 2008 and was the reflection of favorable market conditions both in The EU and global economy. Due to severe economic and financial crisis in Ukraine, trade in goods dropped in 2014. The future dynamics will be fully impacted by political situation and macroeconomic balance in Ukraine, since 2014 Ukraine had deep devaluation (up to 200%) of national currency and faced the situation with multiplicity exchange rates.

Despite the growth from 2003 until 2008, the trade balance is still positive only for Ukraine. To explain this situation we analyze the structure of trade in goods and is presented at fig. 2:

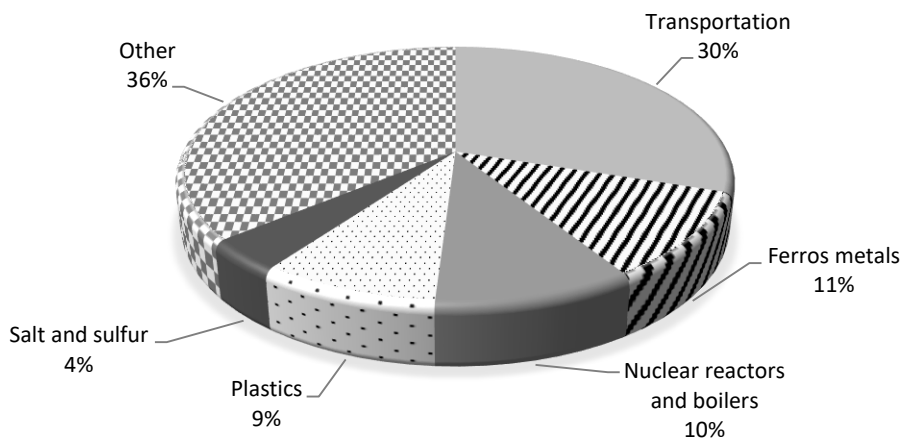


Figure 2. Structure of Slovak exports to Ukraine, 2013 (goods)

Source: Own work.

Due to the modern specialization of the Slovak economy, automobiles is the most significant item in the Slovak export to Ukraine. Besides ferrous metals, Slovakia is exporting nuclear reactors and boilers, thus up to 40% of the Slovak exports to Ukraine is high-tech commodities

While the Slovak import from Ukraine immanently exceeds the export, its structure is presented at fig. 3.

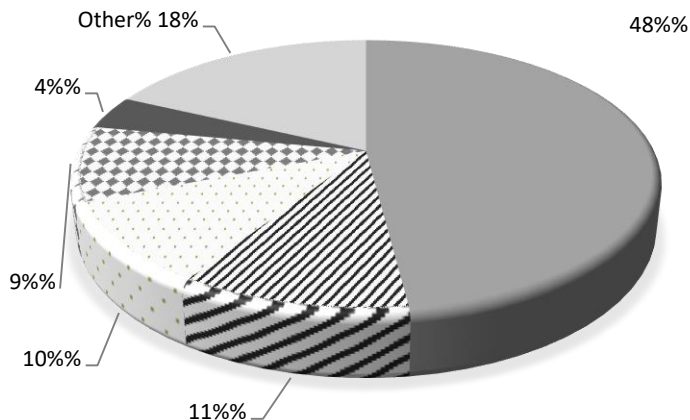


Figure 3. Structure of Slovak imports from Ukraine, 2013 (goods)

Source: Own work.

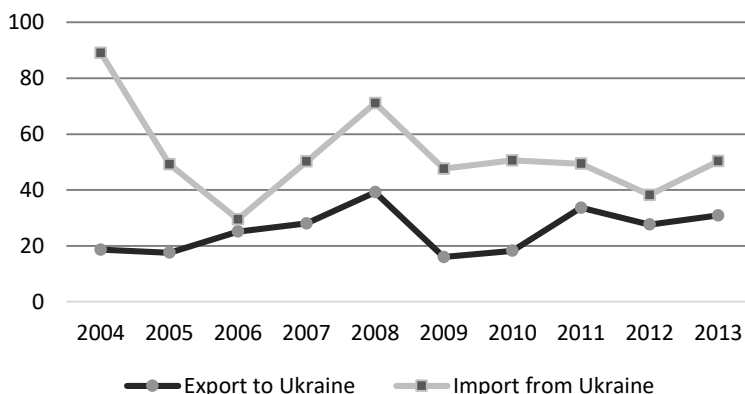


Figure 4. Bilateral trade between Slovakia and Ukraine in services, ths. USD

Source: Own work.

Bilateral trade in services illustrates the general dynamics of trade in goods: impetuous growth in 2006-2008, sharp drop in 2009 along with the negative balance for Slovakia. The main share in trade in services is: transportation services, financial services, pipeline transit etc.

It should be noted that due to the conflict between Ukraine and Russia, in 2014 Slovakia and Ukraine agreed on reverse gas supply to Ukraine, thus the balance of services in 2014 was positive for Slovakia.

FDI play an important role in economic cooperation, but the specific feature of Slovak-Ukrainian relations is unilateral flow of FDI from Slovakia to Ukraine. According to the official Ukrainian statistics none of the Ukrainian investors had been registered in Slovakia.

The dynamic of the Slovak FDI to Ukraine is presented at fig. 5.

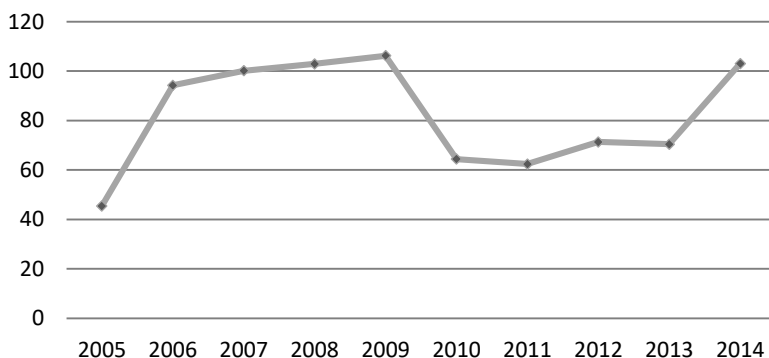


Figure 5. FDI from Slovakia to Ukraine, mln. USD

Source: Own work.

For the period of 2005-2014 we observe considerable fluctuations of the Slovak FDI to Ukraine. Its highest level FDI reached in 2009 and after sharp drop in 2010-2013, the volume of FDI exceeded 100 mln. USD in 2014. Despite the relatively low level of the Slovak investment to Ukraine (0.2% of all FDI to Ukraine), we should emphasize that most of the amount goes to the industry - 39.5% of the total Slovak investment to Ukraine and 16.6% goes to processing industry.

Among the largest Slovak investors to Ukraine: “Arca Capital”, “Minerfin, a.s.”, “Chemosvit, a.s.”, “Slovnaft Plc”, “HB Reavis Group, a.s.”.

It should be noted that despite a number of research papers in Ukraine devoted to the economic systems of Central European countries, Slovakia has never stood in a separate subject for Economic Research and is considered mainly in the context of the “wider” European Union (Zhurauliou, Urban 2014).

Variables and Model

The traditional approach to estimation of gravity equations consists of taking logs of both sides, leading to a log-log model of the form:

$$\ln \text{Trade} = f(\ln \text{GDP}_i, \ln \text{GDP}_j, \text{Indist}, \ln \text{FDI}, \ln N_i, \ln N_j) \quad (2)$$

Taking into account that besides bilateral trade in goods there is a turnover in services and FDI from Slovakia to Ukraine we add more dependent variables and estimate following equations as well:

$$\ln \text{Serv} = f(\ln \text{GDP}_i, \ln \text{GDP}_j, \text{Indist}, \ln \text{Trade}, \ln \text{FDI}, \ln N_i, \ln N_j) \quad (3)$$

$$\ln \text{FDI} = f(\ln \text{GDP}_i, \ln \text{GDP}_j, \text{Indist}, \ln \text{Trade}, \ln \text{Serv}, \ln N_i, \ln N_j) \quad (4)$$

where Trade – trade turnover in goods between Slovakia and Ukraine (log);

Serv – trade turnover in services between Slovakia and Ukraine (log);

GDP_i – volume of GDP in Slovakia (2003-2014) (nominal prices) (log);

GDP_j – volume of GDP in Ukraine (2003-2014) (nominal prices) (log);

dist – distance between Bratislava and Kyiv in km. (log),

FDI – volume of FDI from Slovakia to Ukraine (log);

N_i – population of Slovakia (2003-2014) (log);

N_j – population in Ukraine (2003-2014) (log).

The linear form of equation 2,3,4 has the following view:

$$\ln \text{Trade} (\ln \text{Serv}, \ln \text{FDI}) = \alpha_0 + \alpha_1 \ln \text{GDP}_i + \alpha_2 \ln \text{GDP}_j - \alpha_3 \text{Indist}_{ij} + \alpha_4 \ln N_i + \alpha_5 \ln N_j \quad (5)$$

We run unit root test for the time series using Phillips-Perron test (table 1). We use EViews software for the modelling.

Table 1. Unit root test for Gravity model

Phillips–Perron test							
	lnTrade	ln Serv	lnGDP _i	lnGDP _j	lnFDI	lnN _i ,	lnN _j
c	***	**	*	-	*	*	*
ct	***	**	-	*	*	*	*
c - diff	***	***	***	***	***		
ct - diff	***	***	***	***	***		

*p < 0.10; ** p < 0.05; *** p < 0.01;

Source: Own work.

Regression results from estimating of the equation using OLS method is reported in table 2. We work with stationary variables on 10% level.

Table 2. Gravity model estimation

Variable	lnTrade	lnServ	lnFDI
Dist	-377.83 (-0.50)	-1105 (-1.05)	-1291.9 (-0.82)
lnServ/lnTrade	-0.32 (2.84)	-0.35 (-0.572)	-1.17**/-1.15 (-2.93) (-1.63)
lnGDP Slovakia	0.41 (0.63)	4.99*** (5.40)	6.45** (3.23)
lnGDP Ukraine	1.41* (4.71)	-0.15 (-0.159)	0.905 (0.69)
lnFDI	-0.24** (-2.52)	-0.579** (-2.93)	-
lnN Slovakia	16.75 (0.88)	89.86** (3.21)	119.2** (2.57)
lnN Ukraine	20.49* (2.32)	66.99** (3.83)	96.24** (3.97)
R ²	0.98	0.92	0.95
DW	3.24	3.09	3.45

Note: ***, **, * imply significance at 1%, 5%, 10% levels respectively t-statistic (in brackets)

Source: Own work.

The model showed the negative impact of distance on the growth of bilateral trade (both in goods and services). But the coefficient did not have enough significance. We think that it might be explained by the growing share of borderlands cooperation (neighboring regions of Slovakia and Ukraine) and the distance in the model was between Bratislava and Kyiv.

The size of GDP was significant for bilateral trade in goods, where the size of the Ukrainian economy has positive impact on turnover. We think, that this is the illustration of the Slovak exports to Ukraine, where automobiles have the largest share, thus the growing demand for the Slovak goods depends fully on the GDP growth.

And the volume of the Slovak GDP has positive influence on FDI to Ukraine that is emphasizing one-way FDI flows from Slovakia to Ukraine.

As we included the size of the countries' population into the model we see the significant impact of the size of the Ukrainian population on trade turnover in goods, services and FDI.

Table 3. Results from residual tests

	Results for equat. 1	Results for equat. 2	Results for equat. 3
LM-test (Breusch-Godfrey)	6.9 (0.075)	2.26 (0.251)	5.65 (0.150)
Heteroskedasticity Test: Breush-Pagan-Godfrey	0.678 (0.659)	0.55 (0.730)	1.12 (0.459)

Note: P-values in brackets

Source: Own work.

The p-values of the autocorrelation (BG-test) and heteroskedasticity (BP-test) show that the null hypothesis of non-autocorrelation and homoscedasticity is not rejected.

To test stability of coefficients, CUSUM and CUSUMSQ tests were performed. Figure 6 displays the CUSUM statistics plotted within 5 % significance confidence bounds. Since the graph of this statistic remains within its confidence interval the null hypothesis of parameter constancy is not rejected.

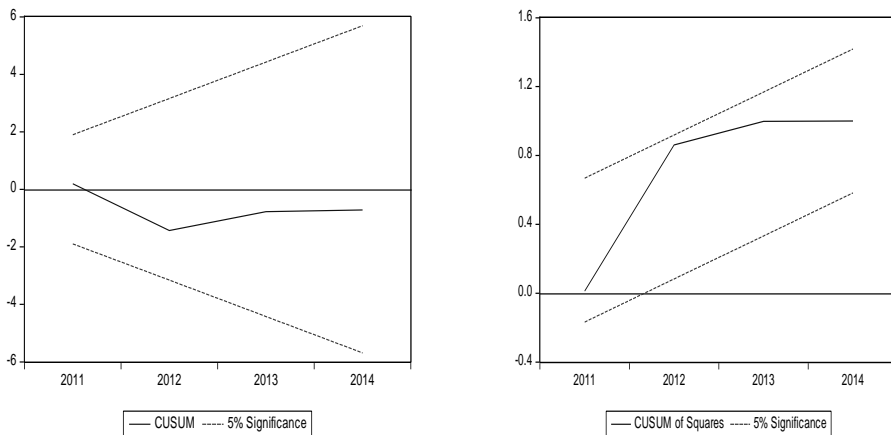


Figure 6. Cumulative Sum test (left) and CUSUM of Squares (right)

Source: Own work.

The CUSUM of Squares test (Figure 6) is a cumulative sum of squared residuals. According to Vogelvang (2005) the expectations of the CUSUM of Squares statistic run from zero at the first observation until the value of one at the end of the sample period. The test statistics are plotted with 5 % confidence interval. Since the statistic does not hit the critical bound, the coefficients are stable over observed period of time.

Perspectives of Future cooperation

Trends for further bilateral relations between Slovakia and Ukraine are presented on Figure 7.

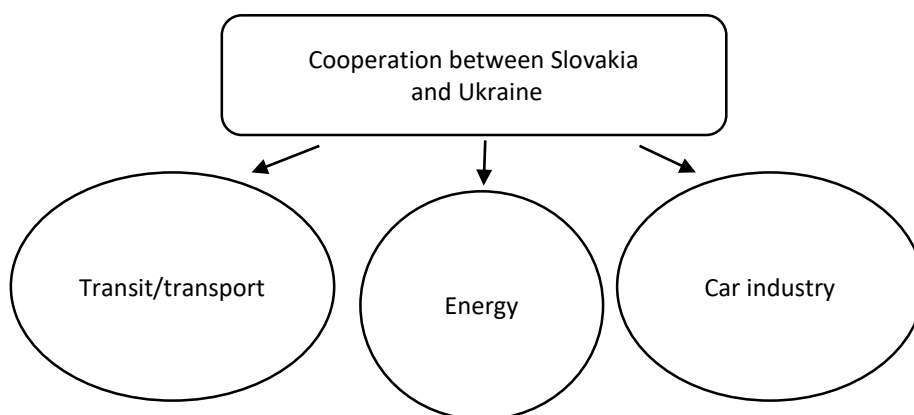


Figure 7. Cooperation between Slovakia and Ukraine

Source: Own work.

Priority areas of trade and economic cooperation - energy and transport.

Major projects of bilateral cooperation:

- Reverse supply of gas;
- Construction of broad-gauge railway from Kosice to Vienna.

Taking into account the growing share of car manufacturing in Slovakia, in order to reduce costs, it could be a multilateral project of relocation of the facilities to the Ukrainian enterprises.

4. Conclusions

After the research, we came to the following conclusions. The dynamics of bilateral economic relations emphasizes openness of the economy of Slovakia and Ukraine. Accession of Slovakia to the euro area coincided with the global financial crisis, so all items of economic cooperation had sharp decline. Given the difficult economic and political situation in Ukraine, the growth of trade between the countries will be volatile.

The evaluation of the gravity model showed a negative impact of distance for the growth of trade turnover in goods and services. Of particular importance were not only the sizes of the two economies, but also the number of the population. Taking into account the one-way flow of foreign direct investment from Slovakia to Ukraine, the size of Ukrainian population positively affects the further growth of the Slovak investment but under the conditions of the appropriate investment climate.

REFERENCES

- Anderson, J. A., (1979). Theoretical Foundation for the Gravity Equation//*American Economic Review*, 7, Vol. 69, No. 1, pp. 106–116.
- Anderson J., (2003). Gravity with Gravitas: A Solution to the Border Puzzle/ J. Anderson, E. Wincoop // *American Economic Review*, Vol. 93, No. 1, pp. 170–192.
- Deardorff, Alan, V., (1998). “Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?” In *The Regionalization of the World Economy*, edited by Jeffrey A. Frankel. Chicago: University of Chicago Press, pp. 7–22. A helpful review and assessment of the gravity model.
- Helpman, E., Krugman, P., (1985). *Market structure and foreign trade*. – Cambridge (MA): MIT Press.
- Helpman, Elhanan, (1987). “Imperfect Competition and International Trade: Evidence from Fourteen Industrial Countries.” *Journal of the Japanese and International Economies*, No. 1 (1), pp. 62–81. A claim for monopolistic competition models of intraindustry trade using gravity model evidence.
- Mandryk, I., (2011). *Sychasnyj stan ukraïnsko-slovackogo spivrobitnyctva v ekonomychnyj sferi*. Access: <https://integrationconference2011.wordpress.com/2013/10/09>.
- Marušiak, J., (2013). “Slovakia’s Eastern policy – from the Trojan horse of Russia to ‘Eastern multivectoralism,’ *International Issues & Slovak Foreign Policy Affairs*, Vol. XXII, No. 1–2, pp. 42–70.

Obchodná a investičná spolupráca medzi Ukrajinou a Slovenskou republikou//
Veľvyslanectvo Ukrajiny v Slovenskej republike.

Access: <http://slovakia.mfa.gov.ua/sk/ukraine-sk/trade>.

Sergienko, T. S., (2012). *Ukrainsko-slovaký vidnosyny: formyvannya systemy mizhderzhavnogo spivrobitnyctva (90 roky XX – pochatok XXI stolittya): Monograph / #6 NDI politychnoj regionolistyky*, Uzhhorod.

Slovakia looks for EU compensation over reduced Russian gas deliveries. Access:
<http://www.euractiv.com/sections/energy/slovakia-looks-eu-compensation-over-reduced-russian-gas-deliveries-308968>

Stan dvustoronniogo torgovelno-ekonomichnogo spivrobitnyctva Ukrainy zi
Slovackou Republikou (2010). Access:

http://www.ukrexport.gov.ua/ukr/tovaroobig_za_stat/slo/5018.html

Tinbergen, J., (1962). *Shaping the World Economy: Suggestions for an International Economic Policy*, New York: Twentieth Century Fund.

Vogelvang, B., (2005). *Econometrics*. FT Prentice Hall.

Zhurauliou, A., Urban, O. A., (2014). *Vplyv makroekomychnyh chynnykiv na platizhny balans Slovachynny / Mizhnarodny vidnosyny Seria “Ekonomichni nayki” #4*. Access:

http://journals.iir.kiev.ua/index.php/ec_n/issue/current