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Modeling the development of trade ties of Russia within the framework of regional integration based on the theory of gravity

Modelar el desarrollo de los vínculos comerciales de Rusia en el marco de la integración regional basada en la teoría de la gravedad

Natalya Yuryevna SOPILKO 1; Anna Andreevna KURASHOVA 2; Irina Ivanovna SHATALOVA 3; Tatiana Vyacheslavovna BOGACHEVA 4; Gozel Muradovna KUTLYEVA 5

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Contents

ABSTRACT:
The aim of the research is the creation of a model for forecasting of international trade flows of Russia with other countries through regional economic integration. The study is based on a systematic approach, the theory of gravity and methods of econometric modeling. On the basis of a systemic approach we classified the development factors as external and internal, and proposed to use econometric analysis for their investigation. Based on the theory of gravity, we formulated a hypothesis that external factors have a major impact on development of international trade ties, their cumulative effect acts like the physical phenomenon of gravity. The following set of variables is proposed as factors: mutual export and import

RESUMEN:
El objetivo de la investigación es la creación de un modelo para pronosticar los flujos de comercio internacional de Rusia con otros países a través de la integración económica regional. El estudio se basa en un enfoque sistemático, la teoría de la gravedad y los métodos de modelado econométrico. Sobre la base de un enfoque sistémico, clasificamos los factores de desarrollo como externos e internos y propusimos utilizar el análisis econométrico para su investigación. Sobre la base de la teoría de la gravedad, formulamos una hipótesis de que los factores externos tienen un gran impacto en el desarrollo de las relaciones comerciales internacionales, su efecto acumulativo actúa como el fenómeno físico de la gravedad. El

operations, external turnover, presence of a common border, logistic parameters, foreign direct investment (FDI), size of population, inflation rates, etc. The results of the research are embodied by a number of gravitational models. We made an attempt to use one of these models to investigate the trade expansion between Russia and its closest economic partners - neighboring countries. The obtained results gave a low value of the square of the coefficient of determination. We concluded that this variant of the model does not allow to achieve the required accuracy of prediction. To increase the adequacy of the model, it was decided to use the dynamic variable which characterizes international trade – "last year export turnover between countries". The results of the research showed that the use of an autoregressive gravity model with inclusion of such a factor significantly improves the quality of the model and enables to forecast the international trade flows between Russia and other countries.
Keywords: Regional integration, gravity models, international trade flows, modeling the development of trade ties of Russia

siguiente conjunto de variables se propone como factores: operaciones de exportación e importación recíprocas, rotación externa, presencia de un límite común, parámetros logísticos, inversión extranjera directa (IED), tamaño de la población, tasas de inflación, etc. Los resultados de la investigación son encarnado por una serie de modelos gravitacionales. Hicimos un intento de utilizar uno de estos modelos para investigar la expansión comercial entre Rusia y sus socios económicos más cercanos: los países vecinos. Los resultados obtenidos dieron un valor bajo del cuadrado del coeficiente de determinación. Concluimos que esta variante del modelo no permite alcanzar la exactitud requerida de predicción. Para aumentar la adecuación del modelo, se decidió utilizar la variable dinámica que caracteriza el comercio internacional: "el volumen de negocios de exportación del año pasado entre países". Los resultados de la investigación mostraron que el uso de un modelo de gravedad autorregresivo con la inclusión de dicho factor mejora significativamente la calidad del modelo y permite pronosticar los flujos comerciales internacionales entre Rusia y otros países.
Palabras clave: integración regional, modelos de gravedad, flujos de comercio internacional, modelado del desarrollo de las relaciones comerciales de Rusia

1. Introduction

The increasing international segregation of the labor market, which takes place even in the current conditions of trade restrictions and sanctions, leads to the activation of the development of economic ties between countries. This is particularly true for the regional economic integration of countries, the interaction between which is universal, fundamental. This suggests that the strengthening of their interaction is of gravitational nature. Like the laws of Newtonian mechanics, those countries that are under the influence of the gravitational field of each other are more actively involved in the processes of economic integration. Understanding the nature of this gravitational influence is essential for modeling the mutual trade turnover of Russia with other countries. The use of projection models based on theory of gravity will show the trends in international trade flows, and make regional trade ties productive and mutually beneficial. Therefore, there is a need for a scientifically substantiated and viable simulation of Russia's trade ties based on the theory of gravity, which allows to anticipate and improve the results of regional economic integration. However, existing simulation models of future Russia's trade ties development do not provide the necessary reliability. These models need improvement due to inclusion of an additional factor. This factor should quantify the mutual trade relations between the countries involved in regional economic integration in the short retrospective.

The review of publications on the modeling of international trade ties in the framework of regional economic integration leads to the following conclusions.

In the scientific community an approach has developed to identify ways of development of international trade ties between countries on the basis of modeling of processes of regional economic integration. One of the scientifically-grounded hypotheses that turned into a theoretical basis for modeling became the theory of gravity which was borrowed by economists from the cosmology section astronomy, investigating the process of structure of the universe. The theory of gravity in cosmology explains the influence of close celestial bodies on each other. Over the past fifty years, it has been used to illustrate the mutual influence of the economies of geographically close countries within the framework of regional trade integration. Differential equations are used for modeling the interaction of celestial bodies in the theory of gravity. The use of equations predicts and describes the behavior of celestial bodies as a complex dynamic system.

The search for directions of further development of Russia's trade ties on the basis of gravitational models is fully justified by the empirical content of the classical theory of regional integration. This is primarily due to the fact that the main purpose of integration for the countries with a stable developed economy is the additional value creation through expanding markets. It is important to understand what kind of economic integration we are talking about: convergence, that is, the interpenetration of economies into one another or about divergence, that is, the tough economic impact of one country or union on the economy of another one (Ramos 2016). Having deep historical roots, the Silk Road Economic Belt (SREB) is an alliance of international regional economic integration aimed at accelerating the economic growth of Central Asian countries. This is a typical case of convergence. As expected results of integration based on SREB, experts (Makarov and Sokolova 2016) point out the following: integration of the Russian transport system into the logistics network of the Eurasian region; strengthening of industrial cooperation between neighboring countries; the transformation of Eurasia into a new center of global economic development.

Numerous publications emphasize the inclusion of significant factors in the model of regional economic integration, but different parameters are identified as key.

Some authors note that the most important quality parameter in the integration is the value chains and their length (Luk'yanov and Dakin 2017). As a quantitative indicator of integration processes, they consider the consequent effects that arise in the national economy from its integration into global value chains. There is also a need to include not only trade flows, but also foreign direct investments (Navrotskaya 2014), logistic indicators (Blyde and Molina 2015) in the models describing the development of international trade ties.

According to some researchers (Minkin, 2017), the processes of international economic integration, international competitiveness and economic development mutually determine each other. Others (Zevin 2016), having analyzed the accumulated experience of inhibition of integration process in peripheral countries, offer some criteria for dividing such processes into two separate phases using the concept of "integration threshold" and indicators of the maturity of regional integration entity.

Some other experts (Bevan and Estrin 2004, Bergeijk and Brakman 2009) consider the indicators of international mutual trade (mutual export and import, total turnover) and the "economic masses" of countries (for example, their GDP and the distance between them) among the main factors affecting the development of production and economic cooperation between countries.

Thus, we can say that modern scholars, as factors of international economic integration, highlight those features of international economic relations which allow countries to effectively integrate into global value chains, while improving both economic development and international competitiveness.

Assessing the possibility of Russia's participation in the processes of regional economic integration, experts consider (Andronova 2016) the role of Russia in the post-Soviet space as to be an integration core and an active participant in integration processes in Asia. Considering the Eurasian Economic Union as a new integration entity in CIS, which is capable to become a new regional and global player, Russia's role is to be in the center of the integration processes. Thus it proves the validity of gravity model in describing the processes of international regional economic integration between countries. In other papers (Zharikov 2016), a hypothesis has been put forward about the close correlation between the dynamics of Chinese imports to the border regions of the Federation with the volumes of yuan trade on the Moscow Stock Exchange. This correlation justifies the mutual influence of integration processes in the financial and trade areas.

All of the above factors are well integrated into models describing the development of regional economic integration based on the theory of gravity for Russia and other countries involved in global economic processes.

We can summarize that the papers of modern scientists provide some research results in the theory of regional integration and provide some observations of influence of the variables appropriate for modeling the development of international ties.

2. Methodology of the Research

Modern scholars offer a variety of mathematical methods to describe the regional integration phenomenon on the basis of the theory of gravity. The development of international ties between countries depends on a large number of exogenous (external) and endogenous (internal) factors. According to Chian (2007), in order to investigate their influence on integration processes, it is expedient to use the methods of econometric modeling based on the system approach, which is quite suitable for modeling regional integration processes within the framework of the theory of gravitation.

Over the past fifty years, many modifications of the gravity model have been created to describe economic correlations. Many scientists (Helpman and Krugman 1987, Redding and Venables 2004, Frankel 1997, Deardorff 1998) used a broader range of variables at a various selection of subjects (countries) for the study.

We proceed further research in this direction and propose a gravity model that uses the most essential for modern Russia key factors of regional economic integration.

The methodological basis of our research is accumulated scientific and theoretical speculations on the theory of gravity applied for trade flow analysis and the results of experts in regression model application based on economic-mathematical modeling to assess the impact of key factors on integration processes. The analysis of gravity models based on a variable mix of factors, considering various key factor inclusion as the most significant one allowed us to determine a model that is the most suitable for Russia's international trade flows forecasting.

Modern gravity models, used for international trade forecasting need adaptation that helps evaluate the impact of internal (endogenous) and external factors on this process. We propose the relevant to current economic environment choice of key factors of regional integration of Russia and their correct inclusion in the predictive model.

The aim of our research is the creation of a projection model of international trade flows of Russia in the frame of reginal integration which should help to manage modern challenges in the region, the country or at the level of an international company.

Based on the gravity models with multi variable calculations, the academic society currently propose to take into account not only the factors themselves, but also their dynamics. Specialists (Olivero and Yotov 2012) suggest using instead of the traditional static gravity equation, the approach based on the theory of increasing returns (economies of scale) in international trade, which is used in a dynamic gravity model. This allows significantly improve the adequacy of the basic model.

We propose to use the dynamics of mutual trade between countries as a key dynamic component of the regional integration process. The easiest way is to add data on last year's exports into the base model, which is supposed to be a lag variable.

$$\ln(F_{ij,t}) = \ln(Y_i Y_j) - a\ln(\tau_{ij,t}) - b\ln(\tau_{ij,t-1}), \quad (1)$$

где F – a trade flow;

Y – an economic mass of each country (GDP);

t – time;

$a\ln(\tau_{ij,t})$ – current trade costs;

$b\ln(\tau_{ij,t-1})$ – trade volume of a prior period.

As a result the base gravity model turns into the following equation (Sopilko et al. 2017):

$$F_{ij} = G(M_i^{\beta 1} M_j^{\beta 2} / D_{ij}^{\beta 3}) + \beta_4 F_{ij,t-1}, \quad (2)$$

where $F_{ij,t-1}$ – last year's export.

Actually the model (2) is a kind of an autoregressive model with an exogenous variable.

We used 38 factors and their various combinations, which included macroeconomic (mutual export /import, mutual investment, etc.), socio-cultural (mutual), institutional and international rating indicators and parameters.

The data base of our study is mutual trade volumes (export/import) per industry brunch by 23 selected countries – the main trading partners of Russia. Countries included in the model are presented in Table 1.

Table 1

Countries included in the model calculations

#	Conventional signs	Country	#	Conventional signs	Country
1.	ARG	Argentina	13.	DEU	Germany
2.	BLR	Belarus	14.	ARE	The United Arab Emirates
3.	BRA	Brazil	15.	POL	Poland
4.	GBR	Great Britain	16.	KOR	Republic Korea
5.	EGY	Egypt	17.	RUS	Russian Federation
6.	ISR	Israel	18.	USA	The USA
7.	IND	India	19.	TUR	Turkey
8.	ITA	Italy	20.	UKR	Ukraine
9.	IRN	Iran	21.	FIN	Finland
10.	KAZ	Kazakhstan	22.	FRA	France
11.	CHN	China	23.	JPN	Japan
12.	NLD	Netherlands	24.	CUB	Cuba

3. The results of research

The results of autoregressive gravity model showed that the coefficient of determination for most types of goods exported from Russia turned out to be as high as possible and aspired to 1, as can be seen from Table 2 and Table 3.

Table 2

The results of basic gravity model calculation of mutual trade flows

Industries	Parameters	The basic gravity model				
		GDP export	GDP import	Distance	N / R2	Ntest / R2test
Food	β-coefficient	0,644	0,747	-0,835	9450	486
	Deviation β	0,010	0,010	0,011	0,417	0,392
Cereals	β-coefficient	0,682	0,293	-0,314	9445	491
	Deviation β	0,021	0,017	0,030	0,093	0,065
Alcohol and tobacco	β-coefficient	0,464	0,773	-0,714	9442	494
	Deviation β	0,010	0,011	0,012	0,368	0,354
Raw materials and mineral resources	β-coefficient	0,525	0,483	-0,124	9453	483
	Deviation β	0,016	0,015	0,028	0,136	0,205
Timber	β-coefficient	0,459	0,447	-0,257	9447	489
	Deviation β	0,017	0,017	0,027	0,096	0,205
Ore	β-coefficient	0,479	0,444	-0,087	9447	489
	Deviation β	0,020	0,020	0,036	0,079	0,026
Coal, oil, gas	β-coefficient	0,387	0,936	-0,666	9453	483
	Deviation β	0,021	0,025	0,029	0,070	0,062
Oils, butter and fats	β-coefficient	0,777	0,255	-0,453	9443	493
	Deviation β	0,032	0,026	0,042	0,046	0,049
Chemicals and pharmacy	β-coefficient	0,691	0,688	-0,667	9452	484
	Deviation β	0,005	0,005	0,006	0,690	0,643

Steel industry	β-coefficient	0,594	0,742	-0,577	9450	486
	Deviation β	0,007	0,008	0,009	0,480	0,640
Ferrous metallurgy	β-coefficient	0,610	0,679	-0,686	9446	490
	Deviation β	0,010	0,010	0,011	0,357	0,349
Nonferrous metallurgy	β-coefficient	0,706	0,518	-0,581	9450	486
	Deviation β	0,012	0,012	0,015	0,258	0,498
Machinery	β-coefficient	0,615	0,736	-0,444	9450	486
	Deviation β	0,007	0,008	0,010	0,482	0,597
FMCG	β-coefficient	0,543	0,697	-0,361	9441	495
	Deviation β	0,012	0,012	0,018	0,246	0,177
Weapons and ammunition	β-coefficient	0,682	0,113	-0,160	9449	487
	Deviation β	0,019	0,015	0,030	0,123	0,029
High-tech products	β-coefficient	0,579	0,615	-0,479	9452	484
	Deviation β	0,009	0,010	0,013	0,345	0,593
Jewelry	β-coefficient	0,363	0,527	-0,180	9448	488
	Deviation β	0,027	0,029	0,047	0,039	0,023

Note: in bold are not reliable indicators, identified with significance level p> 0.05

Table 3

The results of autoregressive gravity model calculation of mutual trade flows

Industries	Parameters	Autoregressive gravity model					
		GDP export	GDP import	Distance	Last year export	N / R2	Nтест / R2тест
Food	β-coefficient	0,507	0,521	-0,570	1,020	9450	486
	Deviation β	0,050	0,050	0,065	0,002	0,977	0,968
	β-coefficient	0,551	0,304	-0,385	0,932	9445	491

Cereals	Deviation β	0,082	0,073	0,112	0,004	0,868	0,776
Alcohol and tobacco	β-coefficient	0,281	0,632	-0,541	0,996	9442	494
	Deviation β	0,051	0,059	0,074	0,002	0,975	0,983
Raw materials and mineral resources	β-coefficient	**0,064**	**0,129**	0,758	1,054	9453	483
	Deviation β	**0,162**	**0,163**	0,325	0,002	0,958	0,929
Timber	β-coefficient	0,353	0,400	-0,321	0,957	9447	489
	Deviation β	0,069	0,070	0,105	0,003	0,939	0,969
Ore	β-coefficient	0,473	0,246	**-0,038**	0,974	9447	489
	Deviation β	0,079	0,071	**0,138**	0,003	0,915	0,977
Coal, oil, gas	β-coefficient	0,313	0,795	-0,538	0,950	9453	483
	Deviation β	0,072	0,087	0,106	0,004	0,848	0,927
Oils, butter and fats	β-coefficient	**0,720**	**-0,136**	**-0,361**	1,082	9443	493
	Deviation β	**1,274**	**1,048**	**1,940**	0,002	0,959	0,987
Chemicals and pharmacy	β-coefficient	0,561	0,549	-0,580	1,023	9452	484
	Deviation β	0,036	0,036	0,045	0,003	0,979	0,982
Steel industry	β-coefficient	0,366	0,528	**-0,214**	1,025	9450	486
	Deviation β	0,066	0,072	**0,121**	0,003	0,958	0,979
Ferrous metallurgy	β-coefficient	0,748	0,366	-0,711	0,984	9446	490
	Deviation β	0,069	0,060	0,077	0,005	0,885	0,741
Nonferrous metallurgy	β-coefficient	0,532	0,479	-0,509	0,969	9450	486
	Deviation β	0,053	0,052	0,068	0,004	0,914	0,899
Machinery	β-coefficient	**0,069**	**0,541**	**0,191**	1,052	9450	486
	Deviation β	**0,308**	**0,334**	**0,664**	0,002	0,982	0,982
	β-coefficient	**0,274**	**0,155**	**0,414**	1,049	9441	495

FMCG							
	Deviation β	**0,221**	**0,220**	**0,464**	0,001	0,991	0,993
Weapons and ammunition	β-coefficient	0,481	**0,145**	**-0,205**	0,979	9449	487
	Deviation β	0,123	**0,104**	**0,191**	0,004	0,882	0,743
High-tech products	β-coefficient	0,474	0,419	-0,441	1,042	9452	484
	Deviation β	0,113	0,110	0,153	0,002	0,975	0,973
Jewelry	β-coefficient	0,399	0,397	**-0,249**	0,924	9448	488
	Deviation β	0,107	0,107	**0,170**	0,006	0,713	0,958

Note: in bold are not reliable indicators, identified with significance level p> 0.05

At the same time according to the autoregressive model results the worse values belong to steel and defense branches of industry (R2 ≈ 0,74).

It is evident from the analysis that R2 value at the most inappropriate destinations of exports is still higher than the highest of the obtained coefficients of determination (common trade R2 = 0,73) in the basic gravity model.

It is interesting that β coefficients of the lag variable in most cases are about two times higher than the GDP of countries and the distances between them. Thus the dominant factor in international trade is an index of a last year's exports.

On the basis of the obtained results we can formulate the important for the development of regional integration conclusion. The achieved level of international mutual trade (expressed as the volume of last year's exports) in the global economy, is the most influencing factor even in the presence of different constraints.

Therefore we can assume that by increasing mutual trade turnover per specific industry or by increasing the country's total export / import turnover in the current year a great contribution is made for the development of integration processes in future. Meanwhile the model allows to determine which branches of international trade, both in terms of export and import have been more dynamic, influencing the further development of integration processes.

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4. Discussion

Usupov et al. (2017) put forth and proved the hypothesis that an increase in intermediate consumption increases the economic potential and competitiveness of the region, and provides the degree of its involvement in interregional processes exchange. Undoubtedly, we agree that growth of intermediate consumption intensifies the participation in exchange processes. At the same time, we believe that it is not enough just to take an interest in the development of trade ties, there is a need for political, financial, institutional, logistic terms, which provide the most favorable regime for trade cooperation with partners located in the region.

This is confirmed by the findings of Kvashnin (2016) that the former model of integration in the financial sphere, based on investments in TNCs, exhausted itself in the terms of centrifugal tendencies in the post-Soviet economic space. Obviously, to enhance regional economic integration, a whole set of terms of external and internal factors is needed. On the question of whether the existing set of terms is necessary and sufficient for regional economic integration, an interesting assumption is made about its future directions based on the p of Latin America. Kheyfets and Khadovich (2017) insist on existence of various factors determining the directions

and parameters of regional economic integration. For example, the process of regional integration in Venezuela is influenced by two factors: internal - the institutional economic and political crisis in the country and external - the change of geopolitical coordinates in Latin America. We believe that the set of these factors for Russia differs from the set for Latin America for the same period. Other scientists (Maltseva and Chupina 2017) assume that transfer of international contracts to the global level for Russia nowadays can be expected in the areas of services and investments, and in the field of technical regulation of international trade.

Our approach to gravity modeling of regional integration, based on theory of gravity and the proposed set of variables contain certain elements of novelty and can trigger a discussion, which will facilitate further research in this area.

5. Conclusions

The following conclusions are drawn from the results of our study.

First despite the importance of the topic, the growth of international trade through regional integration, the nature of the numerous factors affecting it remain poorly understood.

Second, modeling in the framework of one common gravity model to anticipate regional economic integration is not reliable, because every country, industry and commodity has its own specific features. Therefore, it is necessary to search and select the most appropriate model modifications. In our study, we substantiate the prognostic autoregressive gravity model with selection as a factor "last year exports turnover" which allows to make an appropriate search for the most optimal development of Russian international trade ties and enables the forecasting of their future parameters.

Third, the understanding of external and internal factors in the dynamics of Russian international trade and the possibility of its quantitative and qualitative assessment allows to improve the efficiency of regional integrations at national and regional levels. It will enhance the quality of decisions taken to create new integration entities or decisions to expand the scope of their activity in the most beneficial for all participants areas of business.

As a result of the research, we adapted one of the selective-regression predictive models based on the theory of gravity. The essence of proposed model adaptation was in appropriate identification of factors which describe the endogenous impact of environment in the economic conditions typical for modern Russia. The model showed its relevance when used in predicative calculations with a set of factors proposed for such economic conditions. Further research can be carried out in the direction of selection of factors characterizing a specific set of external conditions. It can also be a classification of distinct types of economic conditions and the creation of certain classes of selective regression predictive gravity models for them which identify the future trends of regional integration.

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References

Andronova, I. (2016) Evraziiskii ekonomicheskii soyuz: potentsial i ogranicheniya dlya regional'nogo i global'nogo liderstva [Eurasian Economic Union: potential and constraints for regional and global leadership]. Bulletin of International Organizations, 2, 7-23.

Bergeijk, P. Brakman, S. (2009) The Gravity Model in International Trade. Advances and Applications. Cambridge: Cambridge University Press.

Bevan, A. Estrin, S. (2004) The determinants of foreign direct investment into European transition economies. Journal of Comparative Economics, 3. 775–787.

Blyde, J. and Molina, D. (2015) Logistic infrastructure and the international location of fragmented production. Journal of International Economics, 95. 319-332.

Chian, A. (2007) Complex Systems Approach to Economic Dynamics. National Institute for Space Recearch (INPE). Berlin: Springer.

Deardorff, A. (1998) Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World in The Regionalization of World Economy, Chicago University Pres.

Frankel, J. (1997) Regional Trading Blocs, Peterson Inst for Intl Economics. Date View August 17, 2017 http://bookstore.piie.com/book-store/72.html.

Helpman, E. and Krugman, P. (1987) Market Structure and Foreign Trade. Moscow: MIT Press.

Ignat'ev, Yu. (2017) Qualitative and Numerical Analysis of a Cosmological Modely Based on a Classical Massive Scalar Field. Gravitation and Cosmology, 23, 131-141.

Kheyfets, V. Khadovich, L. (2017) Krizis v Venesuele i regional'naya integratsiya [The crisis in Venezuela and regional integration]. World Economy and International Relations, 5, 79-87.

Kvashnin, Yu. (2016) Vzaimnye pryamye investitsii na prostanstve SNG: problemy, perspektivy, uroki ukrainskogo krizisa [Mutual direct investment in the CIS space: problems, perspectives, lessons of the Ukrainian crisis]. Problems of forecasting, 2, 139-149.

Luk'yanov, S. and Drapkin, I. (2017) Global'nye tsepochki sozdaniya stoimosti: effekty dlya interesuyushcheisya ekonomiki [Global Value Chains: Effects for an Interesting Economy]. World Economy and International Relations, 4. 16-25.

Makarov, I. and Sokolova, A. (2016) Sopryazhenie evraziiskoi integratsii i Ekonomicheskogo poyasa Shelkovogo puti: vozmozhnosti dlya Rossii [Pairing Eurasian integration and the Economic belt of the Silk Road: opportunities for Russia]. Bulletin of International Organizations, 2. 40-57.

Maltseva, V. Chupina, D. (2017) Regional'nye i megaregional'nye torgovye soglasheniya: torgovlya sel'skokhozyaistvennoi produktsiei v Transtikhookeanskom partnerstve [Regional and mega-regional trade agreements: trade in agricultural products in the Trans-Pacific Partnership]. Bulletin of International Organizations, 1, 43-65.

Mynkin, D. (2017) Strany ASEAN: konkurentosposobnost' i perspektivy ekonomicheskogo razvitiya [ASEAN countries: competitiveness and prospects for economic development]. World Economy and International Relations, 2. 65-73.

Navrotskaya, N. (2014) Globalizatsiya investitsionnogo protsessa [Globalization of the investment process]. Dnipropetrovsk: Lira

Olivero, M. and Yotov, Y. (2012) Dynamic gravity: endogenous country size and asset accumulation. Canadian Journal of Economics, 45(1), 64-92.

Ramos, R. (2016) Gravity models: A tool for migration analysis. IZA World of Labor, 239, 1-10.

Redding, S. and Venables, A. (2004) Economic Geography and International Inequality. Journal of International Economics, 62, 53-82.

Sopilko, N. Navrotskaya, N. Kovaleva, E. Orlova, A. Grigoryeva, A. (2017) Dynamics Factors and Slow-Response Characteristics of Russian Trade Ties. Journal of Advanced Research in Law and Economics, 8, 2(24), 625-634.

Usupov, K. Yangirov, A. Akhunov, P. and Toktamysheva, Yu. (2017) Otsenka dinamiki uchastiya regiona v mezhregional'nykh i mezhdunarodnykh obmennykh protsessakh na osnove izmeneniya sootnosheniya promezhutochnogo i konechnogo produktov [Assessment of the

dynamics of regional participation in interregional and international exchange processes on the basis of a change in the ratio of intermediate and final products]. The economy of the region, 2, 559-569.

Zevin, L. (2016) Megaregiony v globaliziruyushchemsya khozyaistve [Megaregions in a globalizing economy]. World Economy and International Relations, 8. 26-33.

Zharikov, M. (2016) Effektivnost' pryamoi torgovli mezhdu Kitaem i prigranichnymi Sub"ektami Rossiiskoi Federatsii [Efficiency of direct trade between China and the border Subjects of the Russian Federation]. The economy of the region, 1, 189-200.

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1. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6; E-mail: sheremett73@gmail.com

2. Moscow Technological University, 119454, Russia, Moscow, Vernadsky avenue, 78

3. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6

4. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6

5. Peoples' Friendship University of Russia (RUDN University), 117198, Russia, Moscow, Miklukho-Maklaya st., 6

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