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EAEU Countries Foreign Trade Policy: Results of Simulation Modeling

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ABSTRACT

The authors examine the impact of foreign trade on the development of the Eurasian Economic Union (EAEU). **The relevance** of the study is related to the role of foreign trade in the integration processes of the EAEU countries. **The purpose** of the study is to identify, on the basis of a modified gravity model of international trade, the possible contribution of changes in the foreign trade policy of the EAEU countries to the growth of their foreign trade. The authors apply a Pseudo-maximum likelihood estimation **method**, which is Poisson regression. Based on the results of the gravity model, covering the data of 97 countries with volumes of 95% of world GDP and 85% of international trade flows, the authors identified the potential contribution of possible changes in the foreign trade policy of the EAEU countries to the growth of their foreign trade turnover, including the reorientation of country directions. The authors gave a quantitative assessment of the foreign trade potential of the EAEU countries in trade with the main partners. The study presents an assessment of the impact on the volume of foreign trade of Belarus of its possible accession to the WTO, which could increase this volume by 11.4%. Particular attention is paid to modeling the trade potential of the EAEU countries with 40 leading trading partners. An analysis of the foreign trade of these countries shows no noticeable changes in the structure of its directions, and the foreign trade turnover continues to grow at an insufficient rate. The simulation results led to the conclusion that the EAEU countries have significant trade potential with the United States, the United Arab Emirates, Singapore, Sweden, Malaysia, Spain and Brazil, and the actual volume of trade with these countries is less than 50% of the potential. Realization of this potential requires, as shown in the study, significant changes in the foreign economic orientation of the EAEU countries and modification of foreign trade policy.

Keywords: foreign economic policy; Eurasian Economic Union; gravity model; foreign trade modeling; foreign trade potential; simulation modeling

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INTRODUCTION

In 2014, Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia created a new integration association — the Eurasian Economic Union (EAEU),[1] having gone from the implementation of a free trade regime to the formation of a single economic space. The strengthening of integration processes in the EAEU occurs simultaneously with the expansion of economic relations with third countries. The assessment of the potential contribution of possible changes in the foreign trade policy of the EAEU countries in order to promote the growth of the volumes of international trade in these countries is the aim of this study. The assessment was carried out by simulation modeling based on a modified gravity model of international trade. Particular attention in the modeling is paid to the opportunities for developing foreign trade of the EAEU countries with the main trading partners, including the largest economies: China, the USA, India, Japan, Germany, Brazil, etc. It seems important to identify the most likely or profitable areas of cooperation as future vectors for the development of foreign economic activity or the reorientation of foreign trade policy.

NEW PARADIGM OF FOREIGN ECONOMIC POLICY

The foreign trade policy of the countries with economies in transition, as they were called in the 1990s, was an important subject of study, primarily because it underwent fundamental changes in connection with the transition to a market economy and, as a result, a different development paradigm and a new state policy of these countries,[2] including a fundamentally different foreign trade policy of countries with a population of 9.1% of the world's population and almost 56% of the population of Europe, which was "open" to the whole world and transferred to economic life according to the laws of functioning of market mechanisms. These essential changes could not but be the focus of attention of many Western researchers, as well as international organizations in the last decade of the 20th century and at the turn of the century. The transition to a foreign economic policy corresponding to that adopted in states with a market economy was even called trade integration of the countries of Western and Eastern Europe [1]. The task of integrating these countries into the multilateral trading system [2] was also discussed, and the issue of trade with these countries (*SUEE*)[3] as called "of paramount importance" [3].

The radical liberalization of foreign trade in Central and Eastern Europe since 1989 has become a key part of economic reform and has been accompanied by a full-scale geographic reorientation of international trade from East to West. At the same time, the expansion of trade with the EU caused only "surprisingly small changes" in the structure of this trade [4]. As noted in [5], even against the backdrop of sanctions, trade with the EU continued to play an incomparably more important role for Russia in 2019 compared to trade with the EAEU, both in terms of imports (by 4.3 times) and exports (by 4.8 times). Along with the growth of the entire foreign trade turnover of Russia in 2021 compared to 2020 by 38.5%, the share of EU countries in this turnover increased by 2.2 p.p.[4]

Offering in this article a study of the foreign trade policy of the EAEU countries, it is necessary to answer the question: what did this reorientation mean and should the EAEU member countries strive to abandon it, whose foreign trade with the EU countries still occupies the main place and, in general, can contribute to strengthening or slowing down the integration of the EAEU

[1] Treaty on the Eurasian Economic Union. Signed in Astana on May 29, 2014 (as amended on March 15, 2018), entered into force on January 1, 2015.

[2] The foreign economic activity of the CMEA countries was cut off from the world market.

[3] Former Soviet Union and Eastern Europe.

[4] Calculated according to the data of the Eurasian Economic Commission. URL: http://www.eurasiancommission.org/ru/act/integr_i_makroec/dep_stat/tradestat/tables/extra/Pages/2021/12.aspx (accessed on 17.03.2022).

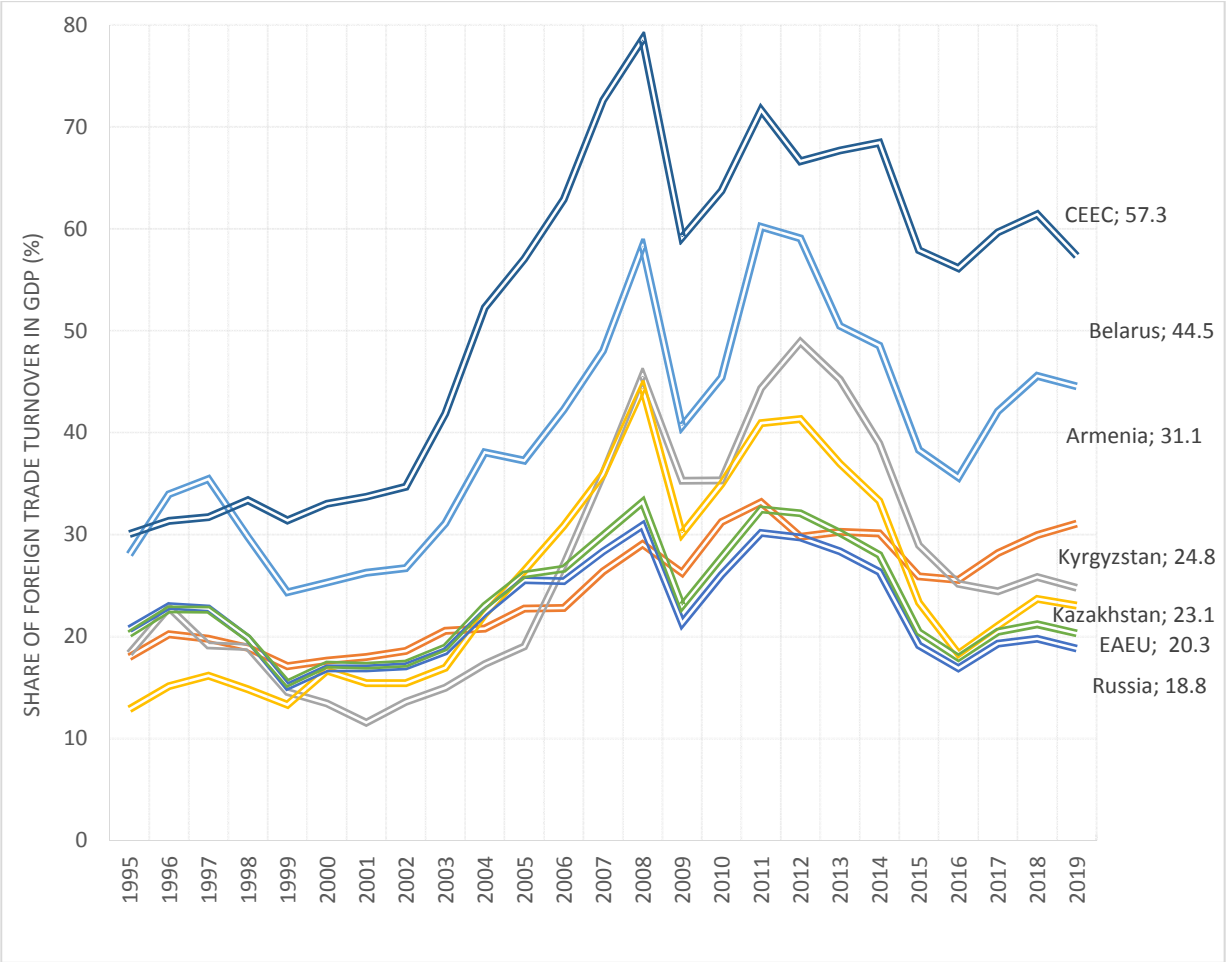

Fig. 1. **Foreign trade turnover of the EAEU and CEE countries**

Note: GDP adjusted for Purchasing Power Parity based on data for EAEU, taking into account intra-EU trade in goods.

Source: compiled by the authors based on the World Bank, World Development Indicators.

member countries. A number of researchers note that numerous contradictions in the coordination of approaches to the foreign economic policy of the EAEU countries do not allow realizing the integration potential of this bloc [6].

In the 30 years since the beginning of the transition to a market economy, the countries of Central and Eastern Europe (CEE or CEEC) and the EAEU have made progress in many areas, including in the field of foreign trade policy and institutional reforms [7]. In the CEE countries that joined the EU in the mid-2000s, there was a significant increase in the volume of international trade and its share of GDP. From 1995 to 2019 in the CEE countries, the share of foreign trade turnover of GDP almost doubled (from 30.1 to 57.3%), in the EAEU countries it remained unchanged (*Fig. 1*),[5] which corresponds only to the global average.[6]

These different patterns of participation of CEE and EAEU countries in international trade are widely discussed in the research literature. The focus is on identifying the reasons why these countries, which initially had very similar conditions, began to observe such different dynamics of foreign trade. Subsequently, the growing differences between these countries in the dynamics and volumes of international trade gave rise to a discussion about the role of various factors in this process: geographical, political, institutional [8, 9], historical, social [10], and others.

[5] 1995 was chosen as the base year due to the lack of data for a number of countries for an earlier period.

[6] International trade and development. Report of the Secretary General. A/74/221. UN, 2019, p. 3.

Table 1

Exports of the EAEU countries to the EU (euro, share)

Countries	2015		2016		2017		2018		2019		2019/ 2015**
	Mln	%	Mln	%	Mln	%	Mln	%	Mln	%	%
Belarus	3,725	2.4	2,948	2.2	3,387.6	2.0	4,433.1	2.3	4,256.9	2.3	14.3
Russia	136,442	87	118,962	88.1	144,686	87.0	168,929.1	86.7	157,808.7	86.7	15.7
Kazakhstan	16,247	10.4	12,762	9.4	17,612.4	10.6	20,547.6	10.5	18,811.9	10.3	15.8
Kyrgyzstan	51	0	73	0.1	165.6	0.1	632.4	0.3	820.0	0.5	16.1 times
Armenia	305	0.2	351	0.3	391.0	0.2	372.8	0.2	406.3	0.2	33.2
EAEU	156,770	100	135,096	100	166,242.6	100	194,915.0	100	182,103.8	100	15.8

Notes: * — the country's share in the total volume of EAEU exports to the EU; ** — increase in the volume of exports for the period.
Source: compiled by the authors based on the Eurostat. URL: https://ec.europa.eu/eurostat/data/database / (accessed on 01.07.2021).

Summing up the results of research on this topic, we can come to a common opinion on two issues. Firstly, the combination of specific characteristics of these countries has mainly contributed to the emergence of such differences in international trade between these groups of countries. Secondly, both the CEE countries and the EAEU countries are involved in international trade at a level below their potential. The main reason for the discrepancy between the dynamics of foreign trade between the CEE countries and the EAEU is seen as the fact that the CEE countries have adopted trade rules[7] used by the "old" EU-15, which brought them tangible benefits, and integration into the EU structures accelerated their development, and they became the main trade and investment partners of the European Union [11]. Although the influence of the integration development of the CEE countries as EU members can be considered dominant, the growth in foreign trade activity of the two groups of countries could be promoted in different ways by the duration of participation in the WTO: the CEE countries joined mainly in 1995–1996, and the largest economies of the EAEU — in 2012 (Russia) and 2015 (Kazakhstan), while Armenia (2003) and Kyrgyzstan (1998) are much earlier. Although the work [12] does not confirm such a role of the WTO.

The positive experience of the CEE countries in the available works, summing up a fairly significant result of the foreign economic activity of these countries, includes issues of trade integration [13, 14], as well as a deep analysis of the impact of the crisis [15]. In addition, there are special works on the generalization of scientific publications on the issues of foreign economic activity of the CEE countries [16].

There are also significant differences between the EAEU countries in the dynamics of foreign trade with the EU countries, which continues to dominate compared to trade between the EAEU countries themselves, the growth rate of which did not accelerate during the first 5 years of its existence of the integration association. In [17], an analysis based on trade complementarity indices led to the conclusion that there is no growth trend for these indices in the mutual trade of the EAEU member countries. Experts also note that although the countries of Central Asia import more goods from Russia than from China, the share of Russia in China's imports has remained insignificant (up to 2%) for

[7] A significant role was played by free trade agreements between the CEE countries and the EU (1992) and the Baltic countries and the EU (1994), which made these countries the main trading and investment partners of the EU [14, p. 36].

Table 2

Imports of the EAEU countries from the EU (euro, share)

Countries	2015		2016		2017		2018		2019		2019/ 2015**
	Mln	%	Mln	%	Mln	%	Mln	%	Mln	%	%
Belarus	5700	6.6	4981	6.0	6035.6	6.2	6450.5	6.5	6851.3	6.5	20.2
Russia	73786	85.2	72369	86.9	85990.0	87.6	85099.1	86.4	90759.6	86.4	23.0
Kazakhstan	6196	7.2	5075	6.1	5082.9	5.2	5832.4	5.9	6324.3	6.0	2.1
Kyrgyzstan	270	0.3	238	0.3	293.1	0.3	284.9	0.3	334.0	0.3	23.7
Armenia	631	0.6	604	0.7	717.3	0.7	862.7	0.9	801.4	0..	27,0
EAEU	86583.6	100	83266.2	100	98118.9	100	98529.6	100	105070.6	100	21.4

Notes: * — the country's share in the total volume of EAEU imports to the EU; ** — increase in the volume of imports for the period.
Source: compiled by the authors based on the Eurostat. URL: https://ec.europa.eu/eurostat/data/database (accessed on 01.07.2021).

many years, just like the countries of Central Asia [18].

Let us consider the dynamics of foreign trade over the 5 years of the existence of the integration union (*Table 1*).

Despite fluctuations in exports to the EU countries, the EAEU as a whole celebrated its fifth anniversary with export growth that exceeded the growth of other macroeconomic indicators,[8] although it was inferior to the growth of imports, with the exception of Kazakhstan, which managed to increase exports with a very low increase in imports. Exports in Armenia were more than 2 times higher compared to the largest economies of the EAEU and had an "explosive" character in Kyrgyzstan — an increase of 16.2 times. The experience of Kyrgyzstan deserves special attention, whose exports to the EU in 2015 were 4 times lower than those of Armenia, and in 2019 began to exceed its exports by 2 times.

If the dominant share of Russia in exports to the EU countries during the period of the existence of the EAEU remained approximately at the same level until 2022, then in the dynamics of imports after the recession of 2015, the share even increased by more than 1 p.p. (*Table 2*). At the same time, the volume of imports tends to grow in all countries except Armenia in 2019 (–7.1%), while the share increased by just over 1 p.p. in Russia and similarly declined in Kazakhstan. Over the 5-year period of the functioning of the EAEU, the highest growth rates of imports (%) from the EU countries were in Armenia (127.15) and Kyrgyzstan (123.5), while Russia ranks 3rd (123.0).

Kazakhstan differs in its foreign trade policy from other EAEU countries, since the increase in imports over the same period was only 2.2, in Belarus — 21. Summing up the results of the fifth anniversary of the formation of the EAEU, experts note that although "... the EAEU contributes to the development of the economy of Kyrgyzstan in the framework of international economic cooperation in the post-Soviet space", there is a "parallel cooperation in foreign economic activity ... in the southeast direction, in which China and Turkey are the leaders" [19, p. 62]. Even before the formation of the EAEU, Kazakhstan's exports to the EU grew from 2003 to 2014 by almost 6 times, and imports from the EU — by 4 times, and the EU has become the leading trading partner of Kazakhstan, ahead of Russia and China [20].[9]

[8] GDP growth (USD PPP in 2011) for the EAEU as a whole amounted to 4.8% in 2015–2018, in Russia as the dominant economy in the community — 4.3%, in the fastest growing economies of Armenia and Kyrgyzstan — more than 13%.

[9] These trends may intensify in the coming period due to the 2022 sanctions.

Before proceeding to justify the choice of a research model to identify the impact of free trade agreements (*FTA*)[10] on the foreign trade turnover of countries, it should be noted that the authors share the point of view stated in [21] on the importance of the impact of trade policy on international trade and explore in their work the impact possible changes in the foreign trade policy of the EAEU countries on the dynamics of the foreign trade turnover of these countries.

CHOICE OF RESEARCH MODEL

Simulation modeling based on a modified gravity model of international trade makes it possible to identify the potential contribution of changes in the foreign trade policy of the EAEU countries to international trade and to assess the possibilities for developing foreign trade of the EAEU countries with other countries and the most probable directions of this trade. The model also allows separately testing of the potential impact on the volume of international trade of the EAEU countries of the conclusion of a free trade agreement (FTA) between the EAEU and the EU, between the EAEU and China, as well as on the external trade of Belarus if this country joins the WTO. In addition, an assessment is made of the impact on international trade of the quality of the country's institutions, measured by indicators of the quality of public administration developed by experts from the World Bank (WB) [22]. In addition to these variables, the specification includes a broad set of control variables measuring geographic distance, border influence, the landlocked status of the importing country, and colonial trade linkages, as past colonial status can translate into the current higher levels of trade [23].

The approach proposed by J. Anderson and E. van Wincoop [24] was used as a theoretical basis for the specification of the gravity equation. This approach is based on the constant-elasticity of substitution utility function and complete specialization of production across countries. According to the well-known gravity equation, which includes symmetrical trade costs, the volume of bilateral trade between countries is a function of the level of income in these countries, the vector of transport and trade costs between them, and the level of each country's propensity to trade with other countries. J. Anderson and E. van Wincoop call this level "multilateral trade resistance" [24]. In logarithmic form, the function has the following form:

$$\ln X_{ijt} = \alpha + \beta \ln Y_{it} + \gamma \ln Y_{jt} + \delta \ln D_{ij} + \varsigma C_i + \eta C_j, \quad (1)$$

where X_{ij} denotes the volume of exports from country i to country j; Y_i and Y_j — the GDP of countries i and j, respectively. D_{ij} is a vector of bilateral transport and trade barriers, while C_i and C_j are participants in multilateral trade resistances. In our case, of particular interest is the determination of the coefficients of the vector D_{ij} and the constants C_i and C_j.

The obtained results of the values of the coefficients from equation (1) are used to model the impact that a change in the values of one of the components of the vector D_{ij} will have on the volume of foreign trade for a particular country. In particular, an assessment will be made of the consequences for the international trade of the EAEU countries under a hypothetical scenario in which these countries enter into an FTA with the EU countries or with China. Gravity model estimates make it possible to cover the consequences of the impact on the volume of foreign trade of Belarus in the event of accession of this country to the WTO.

The definitions of the components of the D_{ij} vector and sources of initial data for all variables used in our study are given in the Appendix (*Table A1)*.

The D_{ij} consists of the following components:

geographical distance — the population-weighted distance in kilometers between countries i and j ($DIST_{ij}$);

the border effect — a dummy variable indicating the presence or absence of a

[10] Free trade agreement — free trade agreement, hereinafter referred to as "FTA".

common border between two countries ($COMB_{ij}$);

landlocked — a dummy variable showing whether the importing country is landlocked ($LDLC_j$);

foreign trade policy: measured by the fact that two trade counterparty countries (WTO_{ij}) are members of the WTO at the same time.

In addition, the impact of the fact of concluding an FTA on bilateral trade flows (FTA_{ij}); is taken into account; the quality of institutions, as the arithmetic mean value of three indicators of the quality of public administration, namely: indicators of the rule of law, fight against corruption and government effectiveness ($INST_i$ и $INST_j$); colonial linkages — as the presence or absence in the past of colonial linkages between trading partners (COL_{ij}).

Along with ordinary least squares (OLS) estimates, the paper uses the pseudo-maximum likelihood estimation method, which is Poisson regression, which allows for solving the problem of heteroscedasticity.[11] The coefficients resulting from the Poisson regression estimates can be easily used for simulation modeling due to the absence of Jensen's inequality issues. For the Poisson regression estimate, the underlying model is given in the following exponential form: $y_i = \exp[(x_i'\beta) + v_i]$, ensuring that y_i is not negative. The econometric specification of the complete model proposed by us in exponential form has the following form:

$$\begin{aligned} X_{ijt} = \exp(&\alpha_1 \ln(POP)_{it} + \alpha_2 \ln(POP)_{jt} + \\ &+ \alpha_3 \ln(GDP)_{it} + \alpha_4 \ln(GDP)_{jt} + \alpha_5 INST_{it} + \\ &+ \alpha_6 INST_{jt} + \alpha_7 COMB_{ij} + \alpha_8 COL_{ij} + \\ &+ \alpha_9 \ln(DIST)_{ij} + \alpha_{10} LDLC_j + \alpha_{11} FTA_{ijt} + \\ &+ \alpha_{12} WTO_{ijt} + \alpha_{13} C_i + \alpha_{14} C_j + \varepsilon_{ijt}). \end{aligned} \quad (2)$$

The definition of the variables of this equation is given in the *Appendix* (*Table A1*). It should be noted that the border effects, colonial linkages, distance between countries and access to the sea, characterized by the variables $COMB_{ij}$, COL_{ij}, $DIST_{ij}$, and $LDLC_j$, unlike other variables, are constant over time. Our sample includes, in addition to the 5 EAEU countries, 92 countries: emerging economies and all OECD countries, covering approximately 95% of global GDP and 85% of total international trade flows for 2000–2019.

RESULTS AND DISCUSSION

The results of the estimates obtained on the basis of the application of the model are given in *Table 3*: using the least squares method (columns 1–2) and pseudo-maximum probability (columns 3–5). All submitted specifications, with the exception of columns 1 and 3, are estimated using the fixed effects of importers and exporters.[12] The specification samples of columns 1–2 and 5 do not include cases in which the volume of bilateral trade is 0. The results show that the specification presented in column 4 is preferred (pseudo coefficient of determination is 0.92).

Since there is no a priori relationship between exports and the population of the exporting country, the elasticity coefficient of the population variable introduced into the model to explain the relationship between the size of the exporting country's market and exports can be negative or positive, depending on whether the sample is dominated by countries that export less as their population grows (absorptive capacity) or countries that export more (economies of scale). In our case, the coefficients of the population variables in the preferred specification are negative for both the exporting country and the importing country.

According to the results of the preferred specification (column 4 of *Table 3*), the GDP elasticity coefficients of exporting and importing countries are 0.67 and 0.51, respectively. In addition to these determinants of international trade, which naturally dominate since net exports are a part of GDP,

[11] If the variance of the error in the regression equation changes from observation to observation, the least squares method must be subjected to some modification, otherwise erroneous conclusions are possible.

[12] The applied pool model (1 and 3) for panel data can give conflicting estimates, since in the case of estimates of trade in pairs of countries, the presence of individual characteristics of an object that is stable over time is obvious.

Table 3

Results of regression estimates

Dependent variable:	Bilateral trade volume, X_{ij}				
	OLS		Poisson		
		FE		FE	$X_{ij} > 0$
Independent variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Population, $LnPOP_i$	0.456 (0.038)***	−0.445 (0.106)***	−0.144 (0.068)**	−0.345 (0.119)***	−0.36 (0.121)***
Population, $LnPOP_j$	0.194 (0.029)***	0.06 (0.078)	0.057 (0.031)*	−0.063 (0.029)**	−0.062 (0.034)*
GDP PPP, $LnGDP_i$	0.842 (0.036)***	0.773 (0.048)***	0.997 (0.059)***	0.668 (0.046)***	0.667 (0.046)***
GDP PPP, $LnGDP_j$	0.825 (0.028)***	0.844 (0.044)***	0.801 (0.061)***	0.509 (0.048)***	0.507 (0.048)***
Quality of Institutions, $INST_i$	1.057 (0.032)***	0.221 (0.048)***	0.215 (0.047)***	−0.235 (0.050)***	−0.245 (0.051)***
Quality of Institutions, $INST_j$	0.519 (0.028)***	0.112 (0.044)**	0.431 (0.037)***	0.026 (0.015)*	0.015 (0.08)*
Landlocked Importer, $LDLC_j$	−0.433 (0.056)***		−0.158 (0.081)*		
Common border, $COMB_{ij}$	1.29 (0.107)***	0.601 (0.108)***	0.658 (0.095)***	0.462 (0.064)***	0.461 (0.064)***
Colonial linkages, COL_{ij}	0.809 (0.116)***	0.954 (0.101)***	−0.036 (0.019)*	0.197 (0.091)**	0.193 (0.091)**
Distance between countries, $LnDIST_{ij}$	−1.226 (0.025)***	−1.614 (0.028)***	−0.673 (0.041)***	−0.782 (0.034)***	−0.786 (0.035)***
Participation of two countries in FTA, FTA_{ij}	0.621 (0.047)***	0.563 (0.046)***	0.312 (0.075)***	0.467 (0.051)***	0.457 (0.052)***
Participation of two countries in the WTO, WTO_{ij}	0.287 (0.046)***	0.168 (0.054)***	0.051 (0.067)	0.11 (0.041)***	0.118 (0.041)***
Constant	−9.798 (0.418)***	1.032 (0.561)*	−11.856 (0.739)***	−0.839 (0.425)*	−0.687 (0.527)
Number of observations	162,911	162,911	184,712	184,712	162,911
R^2 or pseudo-R^2	0.69	0.77	0.87	0.92	0.91

Notes: in parentheses are robust standard errors, clustered by country pairs; */**/*** — significance levels: 10/5/1% respectively.
Source: authors' calculations.

the effects of institutional, geographical and trade variables are also important.

The impact of the quality of national institutions on international trade is also statistically significant. At the same time, in the preferred specification, the coefficient for the quality variable of institutions of exporting countries, in contrast to the coefficient for a similar variable of importing countries, takes a small negative value. This may be due to the fact that these indices do not fully reflect the specifics of institutions that affect foreign trade.

The asymmetry between the coefficients of institutional characteristics of exporting and importing countries is of particular interest, but we have no clear explanation for this. One possible reason could be that the quality of institutions matters more to importers than to exporters since trust in the contracting system in the importer's country determines the propensity of suppliers to trade with buyers.

With regard to various trade and transport barriers, we estimate that the presence of a common border and colonial linkages leads to an increase in trade volumes by 46% and 20%, respectively. And geographical distance has a strong negative impact on bilateral trade flows. Thus, an increase in the distance between exporting countries and importing countries by one percent leads to a decrease in trade volumes by about 0.8%. Finally, the coefficient of the landlocked importing country variable has an expected negative sign (a 15% decrease in trade volume[13]), because trade with landlocked countries is associated with higher trade costs.

The results also show that more liberal trade policies lead to better integration. Thus, the volume of trade between two countries — members of the WTO, other things being equal, is more than 12% higher than the volume of trade between countries, at least one of which is not a member of the WTO. And the signing of an FTA between countries leads to an increase in bilateral trade by about 60%, which is lower than the estimates obtained by A. Subramanian and S.-J. Wei [25] about 80%, and K. Jochmans and V. Verardi [26] — from 61 to 117%. However, it is important to note that these estimates may be overestimated due to the issue of trade policy endogeneity. In the case of countries that foresee an increase in mutual trade in the future and enter into an FTA, empirical estimates that do not consider the problem of endogeneity overestimate the impact of the FTA on trade flows.

RESULTS OF POSSIBLE CHANGES IN THE FOREIGN TRADE POLICY OF THE EAEU COUNTRIES

The results obtained became the basis for conducting simulations to identify the potential contribution of changes in the foreign trade policy of the EAEU countries to promoting an increase in their foreign trade, which has not been given sufficient attention, as well as to assess the potential of the EAEU country in trade with countries that are major trading partners. All of these simulations were performed based on the regression results presented in column 4 of the *Table 3*.

First, the impact of a possible signing of an FTA between the EAEU and the EU and between the EAEU and China was considered. *Fig. 2* shows that the share (%) of exports of the EAEU countries to the EU countries in the total exports of these countries is almost 4 times higher (40.1) than the same indicator with China (12.4). The largest share of exports to China in the total exports among the EAEU countries falls on the largest economies — Russia (13.1) and Kazakhstan (13.6), and the smallest share — on Belarus (2), and the largest share is occupied by Kazakhstan in terms of the share of exports to the EU countries (42), which is 0.2 p.p. concedes to Russia (41.8), the least — to Kyrgyzstan (2.6).

The gain from increased trade for the EAEU countries due to the signing of an FTA between the EAEU and the EU, the EAEU and China or for Belarus due to WTO accession was calculated by multiplying the average gain (the value of the coefficient of the corresponding variable) obtained from the regression estimate and the corresponding

[13] 1– (exp (–0.158)) = 0.15.

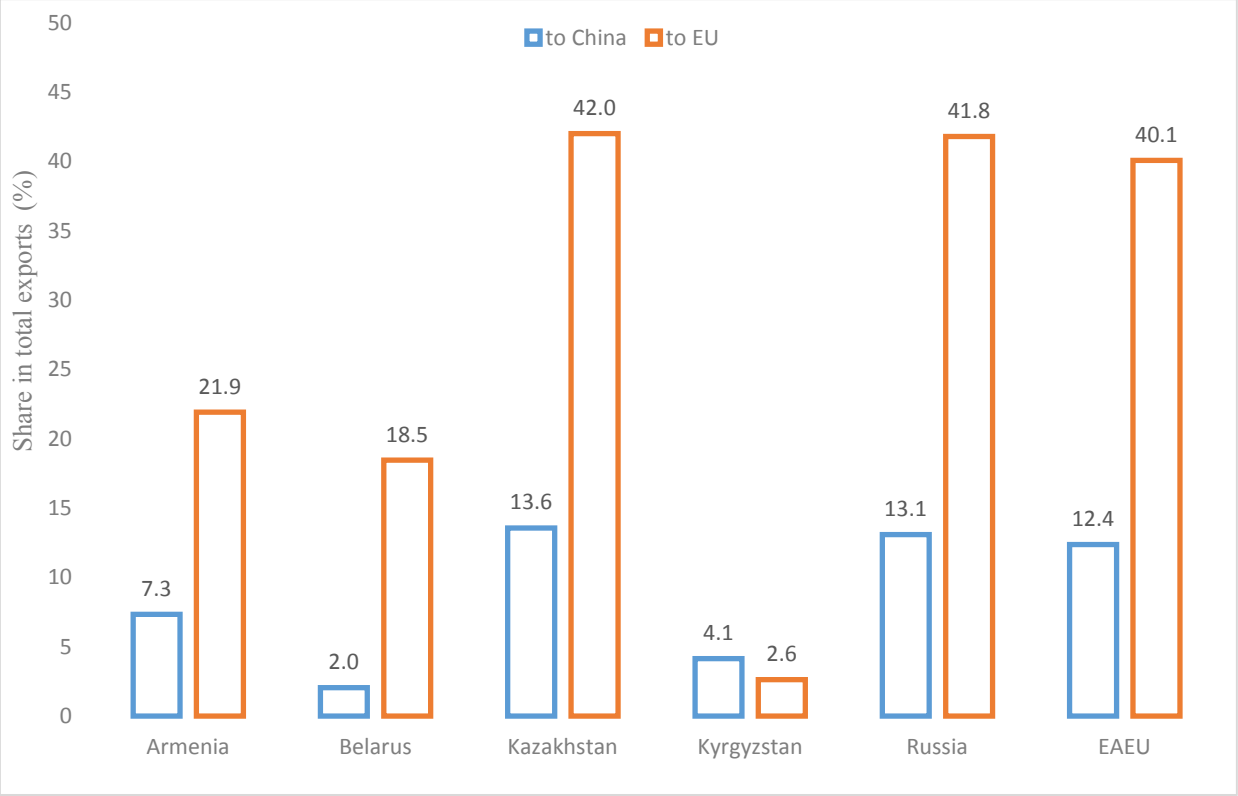

Fig. 2. **Share of export volumes of EAEU countries to China and to EU countries in their total export volume, 2019**

Source: compiled by the authors based on the IMF, Direction of Trade Statistics.

shares of trade volumes. The calculation equation has the following form:

$$TG_{EEU5} = \left(\left(\exp\left(C\,\mathrm{var}_{\mathrm{var}} \times VAR\right) - 1\right) \times 100\right) \frac{\sum_{i=1}^{n}\sum_{j=1}^{m} Tr_i^m}{\sum_{i=1}^{n} Tr_i^{all}},$$

where $EEU5$ — EAEU countries trading with m free trade agreement countries or WTO members in the case of Belarus.

According to our calculations, the largest increase in export volumes since the signing of the FTA between the EAEU countries and the EU will be observed in Kazakhstan and will amount to 25% compared to 24% on average for all EAEU countries. For comparison, the volume of exports of Russia, Armenia, Belarus and Kyrgyzstan will increase by 24.9%, 13%, 11% and 1.6%, respectively. These are quite significant growth volumes, reflecting both the significant impact that the conclusion of an FTA could have on bilateral trade flows between these countries, and the current situation in which the EU traditionally holds a dominant position in the external trade of the EAEU countries.

If an FTA is signed between the EAEU and China, the largest increase (%) in foreign trade among the EAEU countries will be observed in Kazakhstan (8.1) and Russia (7.8). For Armenia, Kyrgyzstan and Belarus, the corresponding increase in trade volumes will be 4.4, 2.5 and 1.2, respectively.

An assessment was made of the impact on the volume of foreign trade of Belarus of its accession to the WTO: it will increase by 11.4%, which significantly exceeds the growth of the EAEU from the conclusion of an FTA with China.

Based on the obtained results of the gravity equation, the trade potential of the EAEU countries was modeled with 40 countries from our sample, the volume of exports of the EAEU countries with which in 2019 amounted to more than 1.7 billion US dollars.

Based on the obtained results of the gravity equation, the trade potential of the EAEU countries was modeled with 40 countries from

Table 4

The ratio of the volumes of actual trade of the EAEU countries with the main trading partners to their potential level, %

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	EAEU
USA	22	5	9	1	18	16
UAE	115	21	31	24	19	22
Singapore	5	8	21	0	36	32
Sweden	3	8	24	0	37	33
Malaysia	3	45	75	0	29	36
Spain	1	2	194	0	27	41
Brazil	0	192	7	0	46	48
India	6	60	53	3	50	51
Japan	2	3	26	0	59	52
France	10	9	227	1	44	58
Israel	35	54	125	0	51	59
Norway	0	66	3	1	62	59
China	117	31	52	20	69	66
Austria	14	5	1	1	86	72
UK	8	170	26	1824	75	80
Germany	43	47	10	12	93	82
Belgium	115	31	28	36	95	85
Denmark	7	12	8	0	113	96
Ukraine	99	453	173	103	64	96
Hungary	4	38	3	1	123	105
Poland	35	91	81	9	112	108
Estonia	14	97	6	28	115	110
Finland	0	7	51	2	120	112
Czech Republic	19	32	21	2	135	116
Azerbaijan	0	479	97	96	111	119
Switzerland	2508	9	505	32	79	119
Romania	1	26	492	11	92	120
Italy	63	8	522	1	98	130
Slovakia	3	47	1	1	185	156
Korea	2	9	169	0	163	157
Lithuania	53	285	272	625	134	157
Egypt	0	69	4	4	201	171
Greece	2	3	513	9	168	189
Latvia	86	154	49	128	218	205
Turkey	2	21	208	322	221	206
Algeria	0	10	60	0	253	217
Bulgaria	2185	78	219	200	222	224
Uzbekistan	49	323	345	536	258	285
Netherlands	258	84	377	4	400	374
Mongolia	196	497	170	257	667	605

Source: authors' calculations.

our sample, the volume of exports of the EAEU countries with which in 2019 amounted to more than 1.7 billion US dollars.

The trade potential of the EAEU countries was calculated as the ratio of actual to potential (potentially possible) export volumes of these countries. The potential volume of foreign trade (export) was calculated as the sum of linear forecasting indicators by regression coefficients. In this case, the forecast value is calculated for each pair of countries separately. The equation for estimating the potential is the following:

$$TP_{EEU5} = \frac{\sum_{e=1}^{5}\sum_{j=1}^{5} FACT_j^e}{\sum_{e=1}^{5}\sum_{j=1}^{5}\left(\exp\left(\Pr_j^e\right)\right)} \times 100,$$

where e — the EAEU countries; j — trading partners of the EAEU countries. For modeling, the actual values of macroeconomic indicators of these countries for 2019 and statistically significant coefficients of regression variables were used (column 4, *Table 3*).

The results presented in *Table 4* show that the EAEU countries have the greatest potential for increasing trade turnover with the United States,[14] the United Arab Emirates, Singapore, Sweden, Malaysia, Spain and Brazil. According to our calculations, the real volume of trade with these countries is less than 50% of the potential level of trade with them. At the same time, there are significant differences between the EAEU countries in the possibilities of realizing their foreign trade potential. With all of the above countries, with which the EAEU countries have the largest reserve for increasing foreign trade volumes, in three cases (Armenia with the UAE, Kazakhstan with Spain and Belarus with Brazil), not only the trade potential was fully realized, but also its level exceeded from 1.1 to 1.9 times.

CONCLUSIONS

Based on the modeling results, it was concluded that the EAEU countries have a significant untapped trade potential with the United States, the United Arab Emirates, Singapore, Sweden, Malaysia, Spain and Brazil. The realization of this potential requires significant changes in the foreign economic orientation of the EAEU countries. If the CEE countries, in order to become full partners in the single European market, "had to revise the rules of their foreign trade and adopt all the laws and instruments of the EU trade policy towards third countries" [14], then the EAEU countries will conclude free trade agreements with third countries jointly, as was the case with Vietnam in 2016, based on mutual interests.

The analysis carried out, firstly, contributes to the disclosure of the factors necessary for the EAEU countries to most effectively use the opportunities provided by the process of international integration. Secondly, it provides quantitative estimates of the trade potential of these countries, which helps to identify priority areas. Calculations have shown that Belarus' accession to the WTO can give a significant impetus to its foreign trade.

The applied significance of the work lies in the fact that it allows government agencies to make changes in foreign trade policy, including the reorientation of the main country directions of trade, which can help build up foreign trade potential with the same volumes of domestic production and thereby give impetus to their further development.

[14] It should be noted that US imports from Russia (according to the US data) are usually two to three times higher than Russian exports to the US (according to the Federal Customs Service). The fact is that a significant part of Russian oil supplies goes by selling it (mostly) to Dutch traders. Russian statistics include this in exports to the Netherlands, and American statistics in imports from Russia.

REFERENCES

1. Piazolo D. Trade integration between Eastern and Western Europe: Policies follow the market. *Journal of Economic Integration*. 1997;12(3):259–297. DOI: 10.11130/jei.1997.12.3.259
2. Drábek Z. The stability of trade policy in the countries in transition and their integration into the multilateral trading system. *The World Economy*. 1996;19(6):721–745. DOI: 10.1111/j.1467–9701.1996.tb00708.x
3. Hamilton C. B., Winters L. A. Opening up international trade with Eastern Europe. *Economic Policy*. 1992;7(14):77–116. DOI: 10.2307/1344513
4. Drábek Z., Smith A. Trade performance and trade policy in Central and Eastern Europe. CEPR Discussion Papers. 1995;(1182).
5. Tkachenko A. A. Sinuous paths of integration: Russia in the EAEU. *Ekonomika. Nalogi. Pravo = Economics, Taxes & Law*. 2020;13(6):46–57. (In Russ.). DOI: 10.26794/1999–849X-2020–13–6–46–57
6. Arapova E. Y., Isachenko T. M. Russian trade policy: Main trends and impact on bilateral trade flows. *International Journal of Economic Policy in Emerging Economies*. 2019;12(1):26–48. DOI: 10.1504/ijepee.2019.098684
7. Gorynia M., Nowak J., Trąpczyński P., Wolniak R. Friend or foe? On the role of institutional reforms in the investment development path of Central and East European economies. *International Business Review*. 2019;28(3):575–587. DOI: 10.1016/j.ibusrev.2018.12.003
8. Levchenko A. A. International trade and institutional change. *The Journal of Law, Economics, and Organization*. 2013;29(5):1145–1181. DOI: 10.1093/jleo/ews008
9. Lanz R., Lee W., Stolzenburg V. Distance, formal and informal institutions in international trade. WTO Staff Working Paper ERSD. 2019(03). URL: https://www.wto.org/english/res_e/reser_e/ersd201903_e.pdf
10. Tkachenko A. A., ed. Russia's foreign economic policy in the context of global risks. Moscow: KURS; 320 p. (In Russ.).
11. Cieślik E., Biegańska J., Środa-Murawska S. The intensification of foreign trade in post-socialist countries and their role in global value chains. *Acta Oeconomica*. 2016;66(3):467–489. DOI: 10.1556/032.2016.66.3.5
12. Rose A. K. Do we really know that the WTO increases trade? *The American Economic Review*. 2004;94(1):98–114. DOI: 10.1257/000282804322970724
13. Bussière M., Fidrmuc J., Schnatz B. Trade integration of Central and Eastern European countries: Lessons from a gravity model. ECB Working Paper Series. 2005;(545). URL: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp545.pdf
14. Cieślik E., Biegańska J., Środa-Murawska S. Evaluation of trends in foreign trade development in the post-communist countries of Europe in the years 2000–2012 following their accession to the EU. *Quaestiones Geographicae*. 2016;35(4):35–48. DOI: 10.1515/quageo-2016–0033
15. Gurgul H., Lach Ł. Export diversification and economic growth in transition: lessons from the 2008 financial crisis in CEE. *Metody Ilościowe w Badaniach Ekonomicznych = Quantitative Methods in Economics*. 2013;14(1):137–149. URL: http://qme.sggw.pl/pdf/MIBE_T14_z1.pdf
16. Jaklič A., Obloj K., Svetličič M., Kronegger L. Evolution of Central and Eastern Europe related international business research. *Journal of Business Research*. 2020;108:421–434. DOI: 10.1016/j.jbusres.2019.06.046
17. Kodirzoda F. A. External and internal orientation vector of trade relations of the EAEU countries. *Vestnik universiteta (Rossiisko-Tadzhikskii (Slavyanskii) universitet) = The University Bulletin. Russian-Tajik Slavonic University*. 2020;(3):73–81.
18. Polivach A. P. Trade of Central Asian countries with Russia and China. *Rossiya i novye gosudarstva Evrazii = Russia and New States of Eurasia*. 2019;(4):136–147. (In Russ.). DOI: 10.20542/2073–4786–2019–4–136–147
19. Fynchina Kh. A. The Eurasian Economic Union and the development of foreign trade of the Kyrgyz Republic. *Vestnik Kyrgyzsko-Rossiiskogo Slavyanskogo universiteta = Herald of KRSU*. 2020;20(7):55–62. (In Russ.).

20. Kembayev Zh. Partnership between the European Union and the Republic of Kazakhstan: Problems and perspectives. *European Foreign Affairs Review*. 2016;21(2):185–203.
21. Goldberg P. K., Pavcnik N. The effects of trade policy. In: Bagwell K., Staiger R. W., eds. Handbook of commercial policy. Vol. 1, Pt. A. Amsterdam: North-Holland; 2016:161–206. DOI: 10.1016/bs.hescop.2016.04.002
22. Kaufmann D., Kraay A., Mastruzzi M. The worldwide governance indicators: Methodology and analytical issues. World Bank Policy Research Working Paper. 2010;(5430). URL: https://openknowledge.worldbank.org/bitstream/handle/10986/3913/WPS 5430.pdf?sequence=1&isAllowed=y
23. Head K., Mayer N., Ries J. The erosion of colonial trade linkages after independence. *Journal of International Economics*. 2010;81(1):1–14. DOI: 10.1016/j.jinteco.2010.01.002
24. Anderson J. E., van Wincoop E. Gravity with gravitas: A solution to the border puzzle. *The American Economic Review*. 2003;93(1):170–192. DOI: 10.1257/000282803321455214
25. Subramanian A., Wei S.-J. The WTO promotes trade, strongly but unevenly. *Journal of International Economics*. 2007;72(1):151–175. DOI: 10.1016/j.jinteco.2006.07.007
26. Jochmans K., Verardi V. Instrumental-variable estimation of gravity equations. Cambridge Working Papers in Economics. 2019;(1994). DOI: 10.17863/CAM.47808

APPENDIX

Table P1

Variables, their definitions and sources

Variable	Definition	Formula	Source
$\text{Ln}X_{ij}$	Logarithm of bilateral trade (volume of exports from country *i* to country *j*), mln USD	–	International Monetary Fund, Direction of Trade Statistics (DOTS)
LnPOP_i	Logarithm of the population of country *i*, million people	–	World Bank, World Development Indicators
LnPOP_j	Logarithm of the population of country *j*, million people	–	Ibid.
LnGDP_i	Logarithm of the GDP of country *i*, mln USD PPP	–	Ibid.
LnGDP_j	Logarithm of the GDP of country *j*, mln USD PPP		Ibid.
INST_i	The arithmetic mean value of three WB governance quality indicators	$\text{INST}_i = (\text{WB}c_i + \text{WB}rl_i + \text{WB}rq_i) / 3$, WB*c* – corruption prevention, WB*rl* – rule of law, WB*rq* – government effectiveness	World Bank, Worldwide Governance Indicators
INST_j	The arithmetic mean value of three WB governance quality indicators	$\text{INST}_j = (\text{WB}c_j + \text{WB}rl_j + \text{WB}rq_j) / 3$	Ibid.
COMB_{ij}	Common border dummy variable	Takes the value 1 if the countries have a common border, and 0 otherwise	Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), GeoDist database
COL_{ij}	Dummy variable for the presence or absence of colonial linkages	Takes the value of 1 if trading partners had colonial linkages, and 0 otherwise	Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)
LnDIST_{ij}	Logarithm of distance between two countries, km	-	Ibid.

Table P1 (continued)

Variable	Definition	Formula	Source
$LDLC_j$	Dummy variable whether or not the importing country is landlocked	Takes the value 1 if the importing country is landlocked, and 0 otherwise	Ibid.
FTA_{ij}	Free trade agreement dummy variable	Takes the value of 1 if there is a bilateral free trade agreement between two countries, and 0 otherwise	URL: WTO.org
WTO_{ij}	WTO participation dummy variable	Takes the value 1 if both countries are members of the WTO and 0 otherwise	Ibid.

Source: compiled by the authors.

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