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Post-soviet economics in the context of international trade: opportunities and threats from mutual cooperation

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ABSTRACT

Regional cooperation represents a viable alternative to the ongoing process of globalization, in which countries can optimally respond to the changes in the external environment through regional integration, while a larger market size tends to provide better sales opportunities. The purpose of this paper is to identify common determinants of the impact of economic and trade cooperation on the convergence of the economies of the member states of the Eurasian Economic Union (EAEU). We attempt to define a conceptual framework for cooperation between post-Soviet countries with an emphasis on their diversity.

In this article, we are using the extrapolation methods that involve the estimation of the parameters of approximating dependences with the ordinary least squares method (OLS) and its modifications as well as the exponential smoothing method. The main reason for conducting this study as well as the major value-added of this paper is in its focus on the regional cooperation of the post-Soviet countries with the assessment of its role on accelerating economic growth, while the main limitation of this study is its focus on predicting the values for one year only which is subjected to the lack of more recent data.

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1. Introduction

Nowadays, an era of active globalization of world economic policy which lasted more than 30 years is coming to an end. It is replaced by fundamental shifts in the form of trade and economic regional associations (Petricevic & Teece, 2019; Kukovič & Justinek, 2020; Lake et al., 2021; Matyushok et al., 2021). Confirmation of the status of the format of economic integration of states, as the most promising in the field of international cooperation, can be shown on the example of the recent increase in the

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number of 400 integration associations and agreements registered with the World Trade Organization (World Trade Organization, 2021). The development of integration processes in Europe and in the world and the growth of the economies of the main blocks are influenced by an array of factors: the policy of protectionism, trade wars, the politicization of economic decisions, or the slowdown in the growth of the world economy (Brodzicki, 2016; Strielkowski & Höschle, 2015; Cieślik et al., 2016; Wade, 2018; Justinek, 2020; or Bazaluk et al., 2022).

Currently, the global crisis which was triggered off by the new coronavirus infection is perceived as the deepest since the Great Depression of the 1930s and it became a consequence of global structural changes in the world economy caused by a change in technological and world economic structures (Oravský et al., 2020; Dvořák et al., 2020; Justinek, 2021; Decerf et al., 2021). During this period of revolutionary, technological and institutional changes, the collapse of financial and commodity markets invariably occurs, the escalation of conflicts which culminates in the transition to a new world order. Moreover, it is often predicted that within the course of the ongoing transformation of business models the centre of development of the world economy would inevitably shift to Southeast Asia and Eurasia (Karaganov, 2018; Lai et al., 2020).

The concept of creating an economic union of states on the basis of the existing Union of the Soviet Socialist Republics (USSR) began in the context of the collapse of the Soviet Union at the turn of the 1990s (Sergi, 2018; Tsibulina, 2021). After gaining national sovereignty, the post-Soviet countries faced urgent tasks to ensure economic development and security. The countries of the former Soviet Union had to determine their place in the system of modern international economic relations, the nature of relations with other countries of the near and far abroad during the difficult economic transformation of the 1990s. An active foreign economic policy based on national interests and the creation of the necessary mechanisms to achieve them were called upon to play an important role in their solution. This is why the Eurasian Economic Union (EAEU) comprised of the five member states (Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia) was created (Kaczmarski, 2017; Mostafa & Mahmood, 2018; Yarashevich, 2021).

Nowadays, the Member States of the Eurasian Economic Union in the face of a decrease in economic activity caused by the COVID-19 pandemic, develop and implement budgetary, monetary and financial measures to support the population and business. The implemented state support programs are similar in their focus, but differ in instruments, amount of funding and coverage of sectors of the economy (Vovchenko et al., 2020; Barbier-Gauchard et al., 2021). Most of the measures taken are aimed at supporting individual entrepreneurs, small and medium-sized businesses, and strategic enterprises. The mechanisms for their implementation are the reduction of the tax burden, the introduction of deferrals for credit and tax payments, the provision of concessional financing and government guarantees (Guth & Smędzik-Ambroży, 2020; Razumovskaia et al., 2020).

In these conditions, regional cooperation of the post-Soviet countries can be assigned a significant role in accelerating economic growth, increasing labour productivity, increasing foreign economic activity, reducing poverty, economic inequality,

increasing employment, and strengthening state institutions in all these countries which also experience various issues caused by the economic transformation and transition from the socialist to the market economy. These and a number of other issues of the functioning of the EAEU, frequently omitted by the researchers and specialists, determine the special relevance and value-added of our research that is presented in this paper as well as provide the main reason for conducting this study

Currently, researchers and analysts are showing increased interest in the possibility of defining and empirical measurement, mutual cooperation of the EAEU member states. Therefore, we will focus on the research methodology, which was carried out on the basis of a systematic approach and a comprehensive comparative analysis.

The rest of this paper is structured as follows: The first stage features a review of the research literature devoted to this issue, which shows that in recent years, various aspects have been highlighted in the literature on regional economic cooperation: demographic, economic, social, integration and transformational. The second stage of the research is based on the analysis of materials from the official websites of international organizations, regulatory legal acts, materials of the Eurasian Economic Commission. The third stage contains an analysis of indicators that measure various aspects of the economic development of the EAEU countries, which include: the level of GDP, dynamics of foreign economic activity, integration processes, the level of competitiveness, the degree of digital transformation, etc. The fourth stage includes the application, based on the assessment, forecasting the foreign economic activity of the EAEU countries using extrapolation methods. Finally, the fifth stage concludes this work with the discussion of results, practical implications, overall conclusions, policy implications and recommendations, as well as pathways for further research related to this topic.

2. Literature review

In general terms, the research devoted to the international economic activity such as trade conducted within a framework of a regional economic union is a relatively new direction in economic science which has gained attention of the researchers in the last decade. A significant number of works are devoted to questions related to the research topic, which can be divided into several groups.

The first group includes fundamental scientific works devoted to the theoretical and applied aspects of modern regional economic cooperation, as well as the forms and mechanisms of state regulation in various spheres of the economy (Modigliani, 1988; Tubadji & Nijkamp, 2018; Glazyev, 2019; Rodionova & Kokuytseva, 2020; or Khasbulatov & German, 2020).

The second group of scientific works includes studies devoted to the peculiarities of the international trade and foreign economic activity of the EAEU countries (Kanatov, 2019; Knobel et al., 2019; or Alimkhanova, 2020).

The third group includes research on the problems of integration of the member states of the Eurasian Economic Union (Falkowski, 2017; Ryazantsev et al., 2021; Dragneva & Hartwell, 2021; Tkachenko & Allaiarova, 2021; or Eder, 2021).

In general, all these works make a significant contribution to the development of the theoretical and methodological foundations for assessing regional integration. At the same time, in the studies of an earlier period, the modern features of world development and integration processes taking place in the post-Soviet space in recent years could not be taken into account. It is this specificity that influences the modern factors of increasing the efficiency of Eurasian economic integration and taking them into account presupposes the improvement of the theoretical and methodological foundations for the development of Eurasian cooperation.

In addition, it becomes apparent that taking into account the limitedness of their own resources for national development (production, technological, financial, energy, and raw materials), as well as the absence, at the initial stage of independent existence, internationally recognized and equipped external borders, the post-Soviet countries needed to ensure their national sovereignty by effective methods and avoid political and economic dependence on more developed countries (Moravčíková & Dvořák, 2018). This organizational form was the regional association of states which was shaped up in several stages.

The Eurasian Economic Union (EAEU), which began functioning on the 1st of January 2015, can be rightfully called the most successful economic integration grouping of the post-Soviet states (Heller, 2019). The basis for its creation was the Customs Union and the Common Economic Space within the Eurasian Economic Community (EurAsEC) which existed since 2010 (Rotaru, 2018). Currently, the Republic of Armenia and the Republic of Kyrgyzstan have also joined it. It consists of 5 member states (the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, the Kyrgyz Republic and the Russian Federation) and two observer countries (the Republic of Uzbekistan, the Republic of Moldova).

Despite the creation of other integration associations (CIS, SCO, etc.) earlier on the initiative and with the participation of the Russian Federation, the most significant is the integration initiative for the creation of the EAEU, which is declared as a form of regional economic integration designed to contribute to the comprehensive modernization of the member states. At the same time, a number of questions arise, what is the potential of this association in the world, what are the prospects of this organization in political and economic terms, or what are the possible trajectories of its development and is it a valid alternative to other integration projects in the post-Soviet space.

Based on the main macroeconomic indicators of the development of the EAEU member states, it should be noted that the format of the integration space has a high potential for functioning: the territory is over 20 million square meters. km or 15% of the world's land, population – 184.3 million people. The EAEU countries account for more than 4% of world GDP and more than 80% of the GDP of the CIS countries, over 12% of global raw materials exports. Two states of the union - Russia and Kazakhstan, are among the ten countries with the largest area, and occupy the 1st and 9th places in the world, respectively. Also, the leading positions in the world are occupied by Russia and Kazakhstan in terms of reserves of ferrous and non-ferrous metals, which account for 93% of oil, 65% of natural gas and 82% of coal in the CIS countries.

Table 1. Population of the EAEU countries in 2020 and the UN population forecast for 2050, million people.

EAEU countries	Population	Population forecast in 2050
Armenia	2 959,7	2 728,7
Belarus	9 408,4	8 570,9
Kazakhstan	18 631,8	27 959,4
Kyrgyzstan	6 523,5	8 112,6
Russian Federation	146 748,6	132 730,5
EAEU	184 268,4	180 102,1

Source: United Nations (2019).

For solving the numerous and complex tasks of the regional economic union, the most important approach was the proclamation by the post-Soviet countries of 'multi-vector' as the basic principle of foreign economic activity.

Thus, demographic processes have a significant impact on the development of this integration association. To assess the demographic characteristics of the EAEU member states, we used statistical data from the UN, the Eurasian Economic Union, as well as from the national statistical services of the member states. Currently, the population of the countries participating in the EAEU is presented in Table 1.

The data in Table 1 show the population size of the EAEU countries in 2020 and the forecast by the middle of the 21st century. Thus, the UN demographic forecast suggests a decrease in the geopolitical potential of the EAEU countries, since in the world population by 2050 the population of the union is projected to decline from 184,268.4 million people up to 180 102 million people or by 2.2%.

According to the United Nations, there are differences in the characteristics of the population and the presence of two trends: the 'depopulation trend' characteristic of Russia, Belarus and Armenia, and the countries with a growing population represented by Kazakhstan and Kyrgyzstan (Strielkowski et al., 2016). By the type of fertility and mortality, two groups of countries can be conditionally distinguished in the regional association: the 'European type' (Russia, Belarus, and Armenia), characterized by practically comparable levels of fertility and mortality and low (or zero) natural growth. And the second 'Central Asian type', characterized by high fertility, low mortality and high natural increase (Kazakhstan and Kyrgyzstan).

3. Theoretical background

This section provides the theoretical background for this study describing the economic development aspects of the EAEU Member States including the GDP growth, international trade as well as exports and imports. Moreover, it focuses on the digitalization aspects in EAEU cooperation.

3.1. Economic development of EAEU Member States

We will consider the economic indicators of the effectiveness of the development of the EAEU member states. When selecting the respective indicators for the model, we relied upon the system of indicators of Eurasian integration of the Eurasian

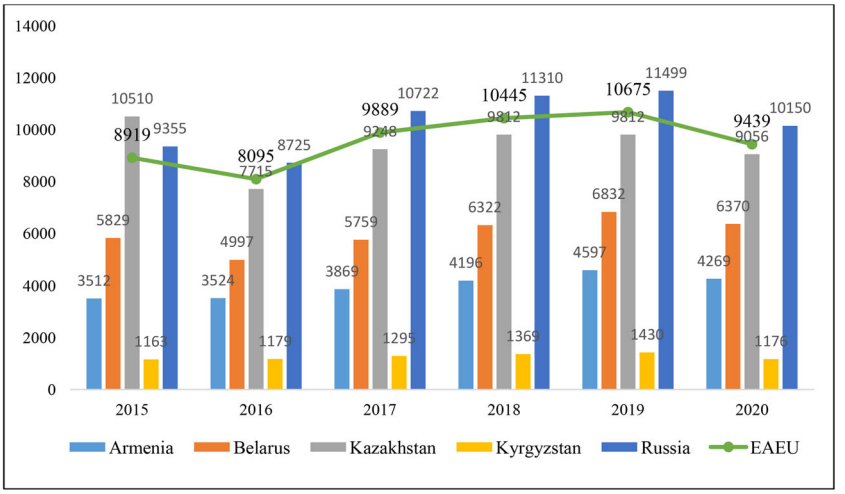

Figure 1. Dynamics of GDP per capita in the EAEU member countries for 2015–2019, in $.
Source: The World Bank (2021) and Eurasian Economic Commission (2021)

Development Bank (EABR, 2009) which includes three blocks corresponding to the main aspects of regional interaction:

i. analysis of regional integration as an integration of markets (convergence of countries is assessed from the standpoint of the scale of flows of goods, services and factors of production between them); ii) analysis of regional integration as a convergence of economic systems; and iii) analysis of institutional cooperation.

A study of the macroeconomic aspects of the formation of the EAEU showed that the state of the regional economy was negatively affected by the coronavirus pandemic. Thus, the gross domestic product in the EAEU at the end of 2020 amounted to 1,738.3 billion US dollars, or 3.2% in the structure of the world gross domestic product (hereinafter referred to as GDP). Compared to 2019, the GDP of the EAEU countries decreased by 2.9%. The largest decline in GDP was observed in Armenia and Kyrgyzstan, by 7.6% and 8.6%, respectively, the smallest in Belarus – 0.9%. The overall negative consequences for the EAEU economy in 2020 amounted to 4.8% of GDP as a whole for the EAEU countries. A significant difference in the dynamics of economic activity between member states is associated with differences in approaches and amounts of funds aimed at supporting the economy, as well as the quarantine measures taken. Measures to minimize the consequences of the pandemic, adapt to changing conditions and support the economy in the EAEU member states were different. The more severe the measures of social exclusion, the higher was the decline in economic activity.

Another indicator of the effectiveness of the development of the EAEU states is the volume of gross domestic product per capita. According to the typology of the Eurasian Development Bank (EBR), there are six main types of regional integration associations (RIO): 'Active RIO', 'Another way', 'Integration rhetoric', 'Discussion forum', 'Zombie', 'Coma' (see Eurasian Economic Commission, 2021).). The EAEU

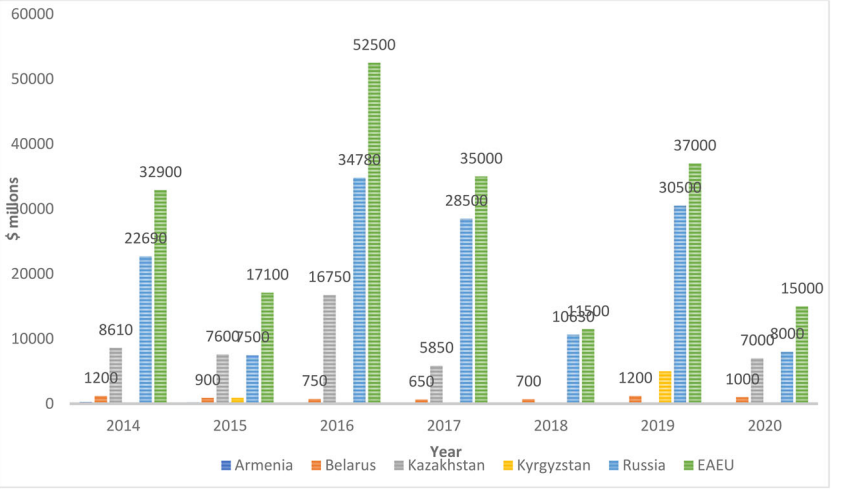

Figure 2. The volume of foreign direct investment in the EAEU countries for 2015–2020, $million.
Source: Eurasian Economic Commission (2021)

claims to be an 'Active RIO', that is, an organization whose main goal is indeed economic integration. But the main factor contributing to the formation of active RIOs is a sufficient level of economic development of the member countries.

Thus, according to a study by the World Bank, the average per capita GDP of Active RIO ($17.8 thousand) is more than twice the average GDP of other types of RIO ($7.8 thousand). The statistics on GDP per capita show a significant 'economic gap' between the EAEU member states. Figure 1 shows the dynamics of the gross domestic product per capita of the EAEU countries for 2015–2019.

Currently, the average GDP of the EAEU countries is insufficient to consider the EAEU as an 'Active RIO'. Differences are also observed in terms of GDP per capita: in Russia this indicator in 2015 amounted to $9355, in Belarus - $5829, in Kazakhstan - $10510. Differences in key macroeconomic indicators are also seen as a deterrent to successful integration. Moreover, over 80% of the total GDP of the EAEU falls on Russia (see Osadchaya & Vartanova, 2018).

The data presented in Figure 1 show that the socio-economic potential of the member countries of the Eurasian Economic Union is significantly different. In particular, the indicators differ by almost 10 times between the GDP per capita of the Kyrgyz Republic and the same indicator for Russia and Kazakhstan. The processes of political instability in the Kyrgyz Republic had a negative impact on economic trends, digital transformation processes, and the values of statistical indicators. In this regard, the assessment of the impact of digitalization on the growth of GDP and employment of the population in the EAEU member states should be considered, taking into account the country program of the digitalization process (Strielkowski et al., 2021). Therefore, when considering the impact of digital initiatives on GDP growth in the region until 2025, it should be noted that the penetration of fixed broadband Internet access has increased (+ 1.7% to GDP). Given that under the country development scenario, the increase will be + 0.8% to GDP. They also identified the impact on

GDP of the processes of increasing international bandwidth (+ 0.66% to GDP) and the spread of e-commerce (+ 0.88% to GDP).

The next indicator of the effectiveness of the development of the EAEU countries is the volume of inflow of foreign direct investment. Since the beginning of the spread of COVID-19, a decrease in investment has been observed in most sectors of the economy of the EAEU countries. The deteriorating global economic outlook, coupled with rising global financial demands, has led to a massive decline in investment flows. Thus, the volume of foreign direct investment in the EAEU in 2020 decreased by more than half (-58.6%), reflecting mainly a decrease in their inflow to Russia by 72.9% (from $32.0 to $8.7 billion). In addition to the Russian Federation, the inflow of foreign direct investment has decreased in Armenia and Kyrgyzstan.

Foreign investors have increased their financial investments in Belarus and Kazakhstan. For instance, foreign direct investment in Belarus grew by 9.3%, while foreign direct investment in Kazakhstan more than doubled from $3.3 billion to $7.3 billion, mainly due to investments in the extraction of metal ores. The volume of foreign direct investment in the EAEU countries for 2015–2020 is shown in Figure 2 that follows.

From the data in Figure 2, it follows that for 2016–2020 direct foreign investments in all EAEU member states decreased. The key investors in the economies of the EAEU countries were companies from European states, China, the USA and Canada, which invested in extractive projects and in the development of manufacturing industries and logistics (Sternad & Justinek, 2018). Austrian and German companies in Belarus, British enterprises in Russia, and French companies in Kazakhstan showed the greatest activity of manufacturing companies from the EU countries in making direct investments in the economies of the EAEU countries. For the period 2016–2020 also, mutual foreign direct investments within the EAEU decreased by 41.3%.

The spread of the coronavirus infection during the COVID-19 pandemic has led to the closure of part of the business and the revision of investment plans (postponement of implementation to a later date, abandonment of the project). The decline in expected revenues and earnings was reflected in lower reinvested earnings, which have a high share in foreign direct investment. Funds of foreign investors include the costs of construction of objects in financial (currency), material (equipment, technology) and other forms, carried out by foreign investors in the reporting period (Zlyvko et al., 2014). These include funds from enterprises with foreign investment, foreign loans, grants and the humanitarian aid.

Among the EAEU member states, there are significant differences in the main macroeconomic indicators. Hence, in Russia, the fiscal burden to GDP in 2015 amounted to 34.5%, in Belarus - 42.6%, and in Kazakhstan - 26.4%. Inflation rates also differ significantly over the same period: in Russia - 11.4%, in Belarus - 16.2%, and in Kazakhstan —- 7.0%.

Another indicator characterizing the level of economic development is the volume of foreign trade activities of the EAEU countries for 2015–2020.

For the period from 2015 to 2018 the volume of foreign trade turnover of the EAEU countries showed an increase from $512,234.3 million to $753,836.4 million.

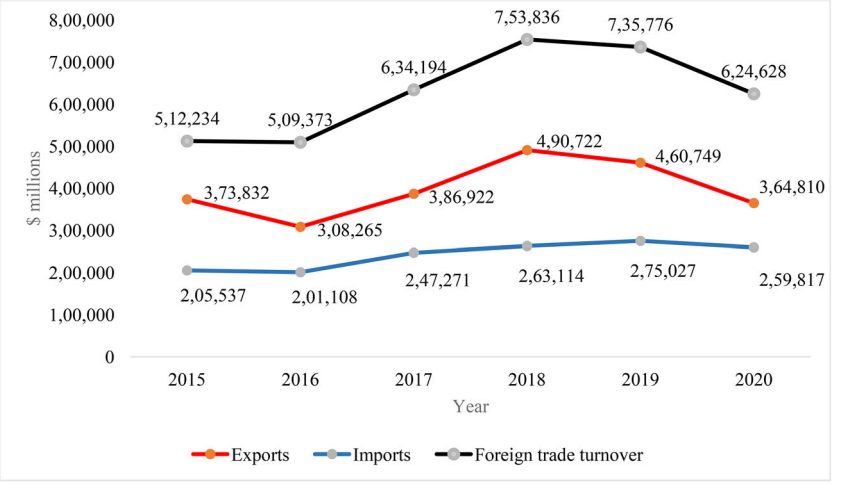

Figure 3. Dynamics of foreign trade turnover, exports and imports of the EAEU countries for the period 2015–2020, $million.
Source: Eurasian Economic Commission (2021)

At the end of 2018, there is a positive growth rate in exports and imports. Due to the beginning of the pandemic process for the period from 2019, the volume of foreign trade turnover showed a decrease by $18,060.5 million or by%. In 2020, the downward trend continued and amounted to $192,208.9 million, or 17.2%, during the pandemic. In comparison with a number of other integration associations in the EAEU, the crisis phenomena were less reflected in the volume of mutual trade in goods than in foreign trade. Mutual trade between the countries of the Eurasian Economic Union (EAEU) in 2015–2020 grew by 35% to $61.6 billion. Figure 3 shows the ratio of foreign trade turnover, exports and imports of the EAEU countries for the period 2015–2020.

In the process of creating the Eurasian Economic Union, the member states within the framework of the integration association have identified the directions of state support for the export of goods to the markets of third countries as a priority area of cooperation. These courses included support for non-resource exports, increasing the competitiveness of the products of manufacturers of the Member States in the markets of third countries.

The coronavirus pandemic and the decline in world prices for the main export commodity groups affected the external and mutual trade of the EAEU countries in three directions: a decrease in production, an increase in trade costs, and a decrease in domestic demand. The volume of mutual trade in goods has decreased between all EAEU member states and has included a wide range of commodity items.

The volume of external and mutual exports of goods of the countries of the Eurasian Economic Union for 2015–2020 presented in Table 2 that follows. The data presented in Table 2 indicate that raw materials and mineral products constitute the basis of the export basket of the Member States to third countries, the decline in prices led to a significant reduction in the value of exports to third countries by 20.9%, while world trade decreased by 7. 5%. At the same time, the index of the physical

Table 2. External and mutual export of goods of the Eurasian Economic Union for 2015–2020, $million.

	2015	2016	2017	2018	2019	2020
International trade	373 845,1	308 264,8	386 922,4	490 722,0	460 749,2	364 810,4
Armenia	1 227,7	1 397,8	1 666,7	1 724,0	1 879,4	1 827,1
Belarus	15 653,9	12 154,9	15 592,3	19 979,3	18 391,1	15 175,9
Kazakhstan	40 835,5	32 806,8	43 240,7	55 064,4	51 659,4	41 868,9
Kyrgyzstan	1 072,7	1 126,0	1 222,8	1 196,2	1 344,4	1 418,7
Russia	315 055,3	260 779,3	325 199,9	412 758,1	387 474,9	304 519,8
to EAEU countries	45 615,7	42 960,3	54 711,6	60 261,5	61 634,0	55 053,9
Armenia	256,2	393,9	571,0	688,5	769,2	709,9
Belarus	11 007,8	11 384,8	13 651,0	13 932,2	14 569,7	14 009,0
Kazakhstan	5 120,3	3 930,2	5 262,5	6 046,8	6 406,2	5 671,9
Kyrgyzstan	410,2	447,1	541,5	640,6	641,7	554,5
Russia	28 821,2	26 804,3	34 685,6	38 953,4	39 247,2	34 108,6

Source: Eurasian Economic Commission (2021).

volume of exports of goods between the EAEU member states decreased by only 0.3%, and foreign trade by 1.7%.

Analysis of the data shows that from 2015 to 2018, all member states increased their export volumes within the framework of mutual trade. Armenia increased its export supplies 2.6 times, Kyrgyzstan – 1.4 times, Russia – 1.35, the growth rates of Belarus and Kazakhstan amounted to 1.15 and 1.2 times, respectively.

The dynamics of the EAEU mutual trade volumes is historically volatile and influenced by external conditions. Thus, in 2015, the physical volumes of mutual trade under the influence decreased by 7%, while the value volumes decreased by 25%. The current crisis also influenced the mutual trade of the EAEU member states. At the end of 2020, the decrease in the value of mutual trade amounted to 24% – 42%, the physical volume of mutual trade - by 10%.

It should be noted that the foreign trade activity of the EAEU member states has a pronounced raw material character. In 2020, in the share of exports of the EAEU member states outside the integration association, mineral products (oil, gas and their derivatives) accounted for about 65–70% of the total volume in 2019. Metal exports accounted for about 11% of exports. Chemical products accounted for about 5% of exports. The volume of external and mutual imports of goods of the countries of the Eurasian Economic Union for 2015–2020 presented in Table 3 that is listed above.

From the data presented in Table 3, it follows that the value of imports of EAEU goods from third countries for 2015–2018. increased from $205,537.4 million to $263,114.4 million. Since 2019, due to the coronavirus pandemic, the value of external imports of goods with third countries decreased from $275,026.7 million to $259,817.1 million.

The value of mutual imports of goods of the EAEU countries from 2015 to 2018 showed an increase from $45 654.2 to $59 732.4 million. The 2019 to 2020 the volume of mutual imports decreased by $7,698.0 million from $61,861.1 million to $54,163.1 million, or by 12.5%. According to experts, the recovery of the value of mutual trade to the level of 2019 in the inertial scenario is possible only in 4–5 years.

One of the strategic directions for the development of Eurasian integration of the last decade is the transition to digital transformation, which consists in a fundamental change in the structure of the world economy, its virtualization through the

Table 3. External and mutual import of goods of the Eurasian Economic Union for 2015–2020, $million.

	2015	2016	2017	2018	2019	2020
International trade	205 537,4	201 107,9	247 271,3	263 114,4	275 026,7	259 817,1
Armenia	2 218,9	2 163,4	2 782,9	3 534,8	3 830,6	2 861,4
Belarus	13 088,6	12 234,7	14 525,9	15 689,1	17 280,5	16 128,4
Kazakhstan	19 356,2	15 513,2	17 081,5	19 561,1	24 411,9	24 220,6
Kyrgyzstan	2 088,8	2 374,5	2 631,1	3 130,7	2 888,3	1 833,5
Russia	168 784,9	168 822,1	210 249,9	221 198,7	226 615,4	214 773,2
from EAEU countries	45 654,2	42 427,2	53 812,5	59 732,4	61 861,1	54 163,1
Armenia	988,8	1 062,6	1 314,2	1 440,7	1 707,0	1 721,9
Belarus	17 207,6	15 381,2	19 715,8	22 760,5	22 205,9	16 649,2
Kazakhstan	11 211,6	9 863,5	12 518,1	14 097,4	15 297,4	14 708,5
Kyrgyzstan	2 065,1	1 626,0	1 863,7	2 161,3	2 100,8	1 885,4
Russia	14 181,1	14 493,9	18 400,7	19 272,5	20 550,0	19 198,1

Source: Eurasian Economic Commission (2021).

emergence of new forms of cross-border movement of virtual goods, capital, and labour. The digital agenda of the EAEU of the member states of the economic union includes issues on digital transformations in the framework of the development of integration, strengthening the common economic space and deepening cooperation, removing barriers that prevent the formation of a single market for goods, services, capital and labour and should be formed taking into account national interests and existing information systems (Korneeva et al., 2021).

3.2. Digitalization and digital transformation in EAEU countries

With regard to the above, the most important task for researchers is to measure the level of development of the digital economy of a particular country and the degree of its digital globalization. An analysis of the world experience in the development of digital transformation and the level of the member states of the Eurasian Economic Union showed that the share of the digital economy (web or Internet economy) in world GDP is now 5.5%. In the EAEU space, the share of the digital economy in GDP is about 2.8%, or $85 billion (Boston Consulting Group, 2021).

The study of international rankings reflecting the trends in the digital transformation of society, the positions of Russia, Armenia, Belarus, Kazakhstan and Kyrgyzstan revealed significant differences and lag in comparison with the leading countries in terms of digital development indicators, technological readiness for digital transformations of certain sectors of the economy and the social sphere (see Table 4).

In fact, the reviewed international ratings indicate a low level of technological readiness of the EAEU for digitalization. To solve the problem of digital transformation of the EAEU, an important aspect is the need to synchronize the national strategies and programs of the member states of the Union on the basis of legal and protectionist mechanisms that ensure the protection of consumer rights and the security of the common digital space of the EAEU. The main directions of the digital agenda of the Union until 2025 approved on October 11, 2017 by the EAEU countries include:

- digital transformation of economic sectors and cross-sectoral transformation;
- digital transformation of markets for goods, services, capital and labour;

Table 4. Positions of the EAEU member states in the international rankings of digital development.

Ranking	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
Measuring the Information Society Report (ICT Development Index, IDI)	75	32	52	109	45
The Global Competitiveness Report	77	–	52	102	57
IPB Global Rank – ICT Price Baskets, IPB	83	27	29	127	11
World Digital Competitiveness Ranking	–	–	36	–	43
Most Technologically Advanced Countries in The World	–	–	36	–	46

Source: Own results based on (Global Finance, 2021; Borodin et al., 2021; World Economic Forum, 2020; IMD, 2020; and ITU, 2021).

- digital transformation of management processes and integration processes;
- development of digital infrastructure and ensuring the security of digital processes.

Each of these areas covers a special range of issues of cooperation between the EAEU countries in the development of the digital economy, that is, digital integration, consisting of three elements:

1. EAEU Data X, is a unified subsystem for the transmission and exchange of data in electronic form, which can be used to exchange information, exchange legally significant protocols between private companies.
2. EAEU ID - a single space of electronic trust, which includes services of identification, authentication, authorization, digital archive, which issue certificates to citizens of one country on the territory of another in digital format.
3. EAEU Geo is a geographic information system and services of a cartographic basis, which help to simplify control over the transportation and monitoring of goods.

The next indicator of the effective functioning of a regional economic association is the competitiveness of national economies, due to the technological base of structure-forming industries, indicators of mutual trade that contribute to the transition to a reproductive model of economic development, stimulating regional supply and demand.

The positions of the EAEU member states on the Global Competitiveness Index of National Economies are presented in the assessments of the World Economic Forum (WEF) experts are shown in Table 5.

Based on the data in Table 5, we can conclude that despite the difficult economic situation in Russia, Kazakhstan and Kyrgyzstan, their global competitiveness is constantly increasing. It is not possible to single out the degree of the integration component, but its rather significant role in increasing the competitiveness of the national economies of the EAEU member states is likely (Krivko et al., 2019). Thence, some problems and projections can be identified and made. In order to develop differentiated support measures in the context of a regional association, it is necessary to identify potential risks to the economic stability of the EAEU member states. In general terms, it can be seen that the integration processes of the countries of the Eurasian Economic Union are influenced by many factors (barriers, exemptions, restrictions) that impede the development of the potential of the EAEU.

Table 5. Global competitiveness index of national economies of the EAEU member states for 2015–2019.

Year	Total countries	Armenia	Kazakhstan	Kyrgyzstan	Russia	EAEU
2015	140	82 (4,01)*	42 (4,48)	102(3,83)	45 (4,44)	45
2016	138	73 (4.07)	53 (4.41)	111 (3.75)	43 (4.51)	44
2017	134	72 (58.9)	59 (61.1)	100 (51.9)	45 (63.9)	40
2018	140	70 (59.9)	59 (61.8)	97 (53.0)	43 (65.6)	45
2019	141	69 (61.3)	55 (62.9)	96 (54.0)	43 (66.7)	44

Note: * the place occupied by the country in the rating and in brackets is the number of points calculated in accordance with the WEF methodology. Belarus is not included in this index, since, according to the WEF experts, it does not create full-fledged conditions for analytical work.
Source: Own results based on the World Economic Forum (2020).

Potential risks for the economic stability of the EAEU Member States can be identified using the following international ratings: 'Doing Business' (Doing Business, 2020), 'Global Innovation Index' (WIPO, 2021), 'Country Involvement in International Trade Index' (UNCTAD, 2020), and 'Fitch Sovereign Credit Rating' (FitchRatings, 2022) (see Table 6 that follows). The member states of the EAEU do not seek to concentrate their efforts only on the domestic market and consider foreign markets as a promising direction for their enterprises. In the structure of exports and imports in the mutual trade of the EAEU member states with third countries, a significant share is occupied by mineral products, while imports are dominated by food and certain types of machinery and equipment.

Analysis of the main risks to the macroeconomic stability of the EAEU member states revealed that they are caused by the persistence of uncertainty due to the ongoing pandemic and the growing budget deficit. One of the main risks is associated with the protracted nature of economic recovery due to the continued quarantine measures in the global economy and a number of internal factors. At present, a significant threat to the integration processes in the EAEU is posed by a slowdown in economic growth due to the persistence of structural imbalances in national economies and their dependence on foreign economic conditions. Inflation risks remain significant for all EAEU member states due to the rise in world prices for food products and raw materials, the prolongation of the fiscal stimulus measures and the weakening of national currencies, resulting in an increase in inflationary expectations. There is a high risk of maintaining a low level of investment activity, the effectiveness of medium and long-term programs, and a worsening demographic situation.

4. Empirical model

Forecasting the results of foreign economic activity of the EAEU member states using extrapolation methods includes six implementation steps and is characterized by the following features of the approach:

- Step 1 - setting the goal and objectives of the study, analysing the forecasting object;
- Step 2 - preparation of initial data for the forecast;

Table 6. Potential risks for the economic stability of the EAEU Member States.

List of risks	Channels of influence on the economy	Probability	Countries
Maintaining restrictive measures due to the COVID-19 pandemic for a long time	Low rates of economic growth of foreign and mutual trade, capital flows, population mobility	High	All EAEU states
High volatility of energy prices in the EAEU markets and world markets	Decrease in profitability of the general government sector, fiscal reserves	Medium	All EAEU states
High level of monopolization in energy markets	Lack of transparency of market pricing mechanisms	High/Medium	Russia, Kazakhstan
Population aging, population decline	Reduced supply in the labour market, shortage of qualified specialists, slowdown in economic growth	High	Belarus, Russia
Inflation risks	Rising world prices that increase inflation, depreciation of national currencies	High/Medium	All EAEU states
Low level of investment activity	Decrease in long-term rates of economic growth, increase in technological lag behind the world's leading economies	High	All EAEU states
Increasing protectionism in the global economy	Decrease in the volume of trade, investment, decrease in the current account balance	Medium	All EAEU states
Tighter sanctions	Increased sanctions pressure and depreciation of national currencies, increased inflation, reduced access to external financing, reduced foreign trade	Medium/Low	Belarus, Russia

Source: Own results.

- Step 3 - for a clearer identification of trends in the development of the process under study, the filtering of the time series was performed, including its smoothing and levelling;
- Step 4 - carrying out a logical selection of the types of the approximating function based on the study of statistical data and logical analysis of the course of the process under study, the most acceptable types of communication equations are selected from a given array of functions.

  The last stage is necessary because it allows, when it comes to selecting the function, to take into account the basic conditions of the process under consideration and the requirements for the mathematical model. The following functions are most often used as approximating functions:
- Linear function

$$y(t) = a + bt \tag{1}$$

- Quadratic function

$$y(t) = a + bt + ct^2 \tag{2}$$

($c > 0$ - growth function, $c < 0$ - extreme function);

- Power function

$$y(t) = at^b \tag{3}$$

- Exponential function

$$y(t) = a\exp(bt) \tag{4}$$

- Modified exhibitor

$$y(t) = k - ae^{-bt} \tag{5}$$

- Hyperbolicfunction

$$y(t) = a + \frac{b}{c+t} \tag{6}$$

- Logistic curve

$$y(t) = \frac{k}{1+be^{-et}} \tag{7}$$

Whenever possible, when choosing the type of the approximating function, the researchers typically resort to a graphical method for selecting the points of the time series located on the *y0t* plane by the type. If it is difficult to select a function according to the graph, sometimes they resort to the analysis of derivatives of the corresponding types of approximation functions (or differences Δ_1, Δ_2, Δ_3 ...) of the corresponding order.For the forecast, the function with the arithmetic means for the difference series of which will be equal to zero or close to zero in absolute value is usually selected. The final decision on the form of the approximating function can be made after determining its parameters, calculating the accuracy and adequacy of the model, and verifying the forecast using the retrospective series.

- Step 5. The estimation of the parameters of the mathematical model for forecasting various types of approximating functions. The most common methods for estimating the parameters of approximating dependences are the ordinary least squares method (OLS) and its modifications, and the exponential smoothing method.
The idea of the ordinary least squares' method is to determine the parameters of the trend model that minimize its deviation from the points of the original time series:

$$S = \sum_{i=1}^{n} \left(\hat{y}_i - y_i\right)^2 \to \min \tag{8}$$

$\hat{y}_i$ - calculated (theoretical) values of the original series;
y_i - actual values of the original series;
n - number of observations.
Discounting is taken into account by introducing some weights into model (21) $\beta_i<1$. Then, we obtain the following equation:

$$S = \sum_{i=1}^{n} \beta_i\left(\hat{y}_i - y_i\right)^2 \to \min. \tag{9}$$

The coefficients βi can be specified in numerical form or in the form of a functional dependence in such a way that, as we move into the past, the weights decrease.

- Step 6. Selection of a mathematical forecasting model based on an assessment of their quality. Regardless of the method for estimating the parameters of extrapolation (forecasting) models, their quality is determined based on the study of the properties of the residual component - $\varepsilon_t = y_t - \widehat{y}_t$ $(t = 1, 2, \ldots, n)$ which means that the magnitude of the discrepancies in the approximation (model building) section between the actual levels and their calculated values (Table 9).

5. Results and discussions

In general terms, the quality of the model is determined by its adequacy to the process under study and its accuracy. Adequacy is characterized by the presence and account of certain statistical properties, and accuracy is characterized by the degree of closeness to the actual data. A forecasting model will be considered the best from a statistical point of view if it is adequate and more accurately describes the original time series.

A trend model $\widehat{y}_t$ of a specific time series y_t is considered adequate if the residual component $\varepsilon_t = y_t - \widehat{y}_t$ (t = 1, 2, … , n) satisfies the properties of the random component of the time series: randomness of fluctuations in the levels of the residual sequence, correspondence of the distribution of the random component to the normal distribution law, equality of the mathematical expectation of the random component to zero, independence of the values of the levels of the random component.

Below, we are applying three forecasting models: for the foreign trade turnover, exports, and imports. Our exponential smoothing approach would allow us to perform the forecasting for each of the variables in question and demonstrate the relationships between the variables in the long run (Figure 6).

In the forecast period, a decrease in the volume of trade of the EAEU member states to $505,212.9 million, or by 19.2%, is possible, as our results suggest (see Figure 4 and Table 7 above).

The export forecast for 2021 showed its possible decrease from $364,810.4 million to $316,376 million, or by 14.3% (see Figure 5 and Table 8).

According to the forecast, the volume of imported goods by the EAEU member states can be reduced from $259,817.1 to $188,836.5 million, or by 27.4%.

6. Practical implications

All in all, the results of forecasting the volumes of foreign economic activity of goods of the EAEU countries obtained in the course of the study can serve as a scientific basis for substantiating measures to support the states of the regional union, which can contribute to an increase in the level of their economic efficiency.

In accordance with the purpose of the study and using both the theoretical analysis of the literature and our empirical model presented and discussed in the previous sections of this paper, we have identified the risks (see Table 6 above) and common determinants of the impact of economic cooperation on the convergence of economies and defined a conceptual framework for cooperation between post-Soviet

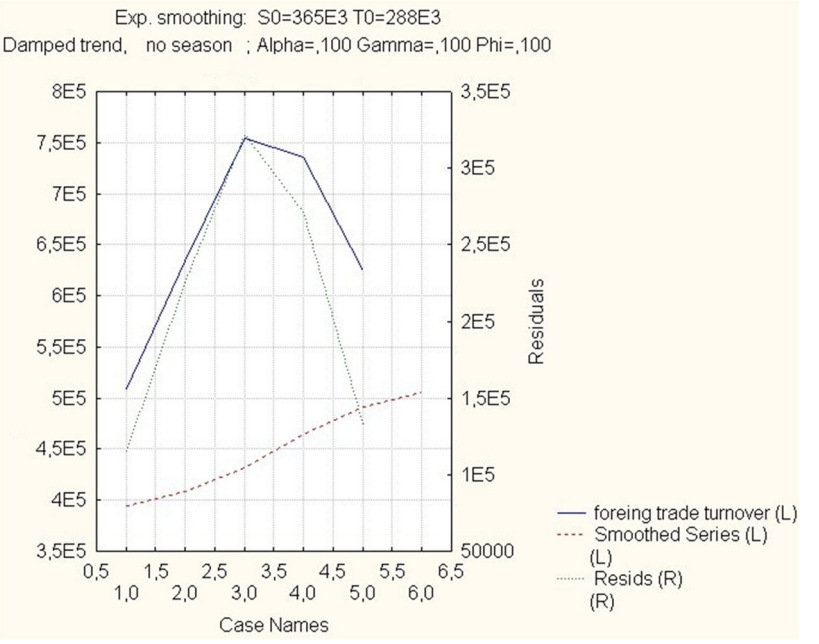

Figure 4. Forecast of foreign trade turnover of goods of the EAEU member countries.
Source: Own results

Table 7. Results of the exponential smoothing for the foreign trade turnover.

Case	Foreign trade turnover	Smoothed series	Residuals
2016	509372,7	394117,9	115254,8
2017	634193,7	408640,0	225553,7
2018	753836,4	431720,6	322115,8
2019	735775,9	464306,8	271469,1
2020	624627,5	491762,7	132864,8
2021		505212,9	

Source: Own results.

countries, taking into account their characteristics. Therefore, the common determinants of the impact of economic and trade cooperation on the convergence of the economies of the member states of the Eurasian Economic Union (EAEU) amidst the decline in the recent economic activity caused by the COVID-19 pandemic are presented in Table 10 that follows.

Taking into account the influence of the above-mentioned factors-challenges, we have identified the key development vectors that predetermine the possibilities of effective interaction within the framework of the Eurasian Partnership. All in all, it appears that the implementation of integration plans provides EAEU member countries with such economic advantages as: (i) expansion of the capacity of domestic markets of the countries by combining disparate national markets into a single one, which stimulates the growth of the aggregate GDP of the association; (ii) increasing the efficiency and competitiveness of production; (iii) scaling of production and deepening of specialization; (iv) creation of a more efficient production structure, taking into account the comparative competitive advantages of each participating country;

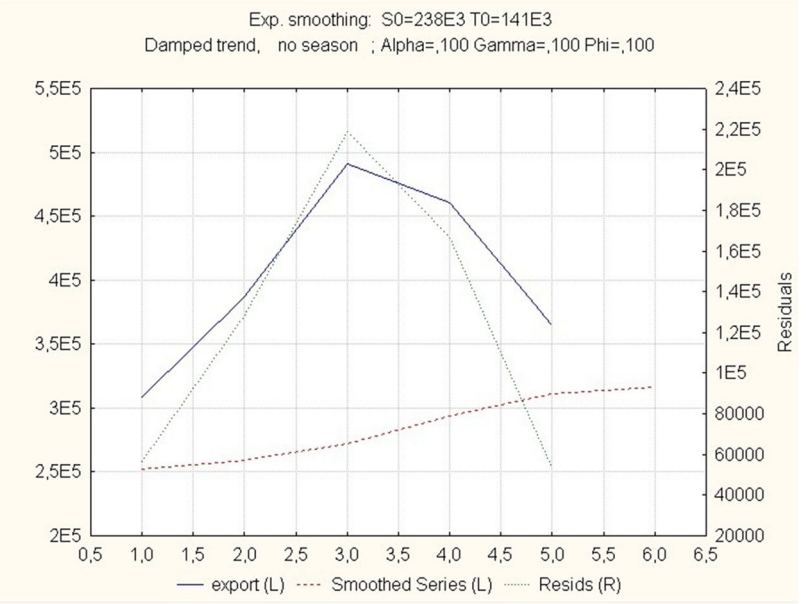

Figure 5. Forecast of the export of goods of the EAEU member countries.
Source: Own results

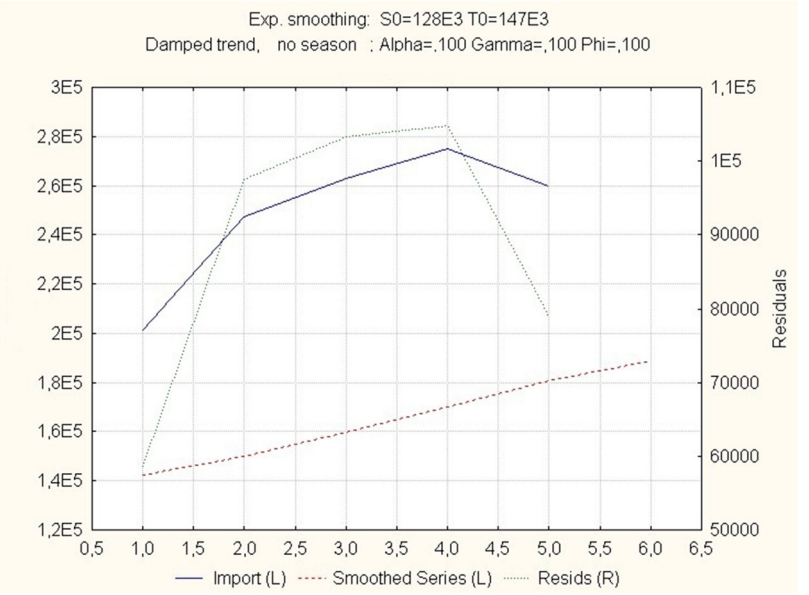

Figure 6. Forecast of imports of goods of the EAEU member countries.
Source: Own results

(v) increasing investment attractiveness through the unification of markets, free movement of four factors, increased productivity and income growth in each state; and (vi) accelerating the pace of economic development.

Table 8. Results of the exponential smoothing for exports.

Case	Export	Smoothed series	Residuals
2016	308264,8	251719,2	56545,6
2017	386922,4	258843,9	128078,5
2018	490722,0	271926,9	218795,1
2019	460749,2	294052,7	166696,5
2020	364810,4	310913,7	53896,7
2021		316376,4	

Source: Own results.

Table 9. Results of the exponential smoothing for imports.

Case	Foreign trade turnover	Smoothed series	Residuals
2016	201107,9	142398,7	58709,2
2017	247271,3	149796,1	97475,2
2018	263114,4	159793,7	103320,7
2019	275026,7	170254,1	104772,6
2020	259817,1	180849,0	78968,1
2021		188836,5	

Source: Own results.

Table 10. Common determinants and prospects for economic cooperation of the EAEU member states.

Common determinants of economic cooperation	Prospects for cooperation
Relatively high level of economic development and readiness for liberalization, competitiveness with foreign countries	Involvement of the executive bodies of the CIS countries in the work of the EAEU and the prospect of merging the two structures
Relatively high level of economic interdependence and complementarity, economic and export diversification	Creation of free trade zones with Egypt and Israel and completion of negotiations with India
Approximately the same level of economic development of member countries	Inclusion in the Chinese-led project 'One Belt-One Road', with the interaction and coordination of the EAEU countries
Dynamic effect of the success of integration plans of associations	Monitoring the movement of goods imported into the customs territory
Similarity of political systems	Implementation of high-tech programs and projects with the involvement of the EDB and the EFSD
Community of cultural origins and traditions	implementation of the Eurasian humanitarian
Geographic proximity between different regions	integration and the creation of a unified information system in the field of education and health care

Source: Own results.

7. Conclusions

To sum it all up, one can see that by creating the Eurasian Economic Union, its founding members intended to take a step towards the establishment of a stable economic body in which closely cooperating participants would play an important role during any crisis. At the beginning of its creation, economic theorists did not fulfil its promise to the ambitious economic growth for the participating countries. For example, the Eurasian Economic Commission predicts that by 2025, the Joint Digital Agenda will provide EAEU with up to 1% per year for further GDP growth.

Our analysis of the foreign economic activity of the states of the post-Soviet region demonstrates that the creation of the Eurasian Economic Union was a timely decision for the former Soviet republics. This is confirmed by the performance indicators such as: an increase in GDP growth, agricultural production, the significance of creating

an internal market, an increase in mutual and foreign trade indicators, an increase in the volume and growth rates of foreign economic activity, a decrease in inflation and unemployment. Within the framework of the Union, conditions have been created to ensure the freedom of movement of goods, services, capital and labour, common (single) markets (medicines, medical products, services) have been opened. Taking into account the current rise of information and communication technologies (ICT), the digital agenda has become an important element of the EAEU implementation.

The countries of the Eurasian Economic Union have the prospects for a successful transition from the inertial scenario to the integration development 'Extended status quo' to the scenario 'Own centre of power' defined in the Main Directions of Economic Development of the EAEU until 2030. This will require decision-making to minimize the impact of the crisis on households, manufacturing sectors, the public finance system, trade relations of the member states, a conceptual change in approaches to the formation and implementation of economic policy which will take advantage of the emerging opportunities to increase the competitiveness of the EAEU. In addition, EAEU has substantial potential in the large-scale infrastructure projects with an integration effect in various sectors of the economy: the energy complex, foreign trade, digital infrastructure, transport and logistics, and the development of a network of food hubs.

Speaking about the limitations of this study, the authors have to acknowledge that it is the focus on predicting the values for only one year (2020) which was done to the lack of the official statistics for further years. This issue also constitutes the pathways for further research when, given more recent statistic and data, it would be possible to predict the values for more years and make substantial prognoses regarding the GDP growth in EAEU.

The experience of EAEU international trade goes through the mutual cooperation in specific sectors of the economy, as well as in the business and investment opportunities of the future. The work that has been done so far within the framework of the Eurasian Union has a direct impact not only on the economies of all its Member States but also on the economies of its trading partners and neighbours. All of this is thanks to the joint efforts that the economies of EAEU countries are now gradually recovering after the COVID-19 pandemic and economic downturn it caused. Thanks to the joint actions of the EAEU partners, their economies are gradually recovering. The interest of the world community in expanding trade and economic ties with the association continues to grow as many positive trends in the development of mutual trade are gradually arising.

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The authors report that there are no competing interests to declare.

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