

Agroindustrial Complex in the Eastern European Countries in the Context of Sustainable Development

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Abstract

The research paper deals with the formation of new scientific solutions concerning evaluation of the development of the agroindustrial complex, its role in ensuring sustainable development of the national economy, identifying problems and developing ways to solve them in the current conditions of the functioning of agrarian production in the countries of Eastern Europe. The research emphasizes the key importance of agrarian production to ensure the food and economic security of Eastern European countries. It has been revealed that the agroindustrial complex plays a significant role in the countries of Eastern Europe, especially as concerns Ukraine, Belarus, Poland, Moldova, Bulgaria and Romania. There are problems with the formation of effective state support of agrarian production in the countries selected for study, especially as regards the countries of Eastern Europe, which are not members of the European Union. The methodology for assessing the development of the agroindustrial complex in Eastern European countries was developed and proposed for use, as well as calculations on its basis were made, which allowed to divide all countries of this region into three groups: countries - outsiders (Ukraine, Moldova, Russia); countries, where the development of agrarian industry is of concern (Belarus, Romania, Bulgaria); countries that need to improve the agrarian sector of the national economy (Hungary, the Czech Republic, Slovakia and Poland). A complex of agrarian production problems was identified for each of the Eastern European countries, and the key ways of their elimination were proposed, which are aimed at: reforming the market of agricultural land; stimulating the development of farms; increasing efficiency of state support of agrarian production; intensification of development and introduction of innovations in the agrarian sector; the transformation of the structure of the agro commodities market, including the optimization of their export and import.

Keywords: Agricultural production; Agricultural industry; Agricultural complex; State support; Countries of Eastern Europe; Sustainable development.



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1. Introduction

The agroindustrial complex is a basis for the sustainable development of any country, determining its food and economic security. It is of special importance in the context of significant macroeconomic fluctuations, as it is more resistant to them due to the high level of government regulation and support (FAO, 2018). We note the importance of the agroindustrial complex for the sustainable development of Eastern European countries, which have significant potential for the development of agriculture and have a significant impact on the world and European markets of food commodities, especially as regards the markets for crop products (cereals, sunflower oil, etc.).

On the other hand, Eastern European countries have significant heterogeneity in the development of the agroindustrial complex, which is expressed in the following: qualitative structure of agricultural lands; ownership structure in agriculture; the structure and number of agribusinesses in terms of size; level of crop production and livestock farming development; sales markets; level of financing; the level and quality of state regulation and support (Dunay, 2014; Horbańczuk and Marchewka, 2017; Kovaltchuk *et al.*, 2017; Lobanov and Zvezdanovich-Lobanova, 2017). There is, however, a thing which allows carrying out research on the agroindustrial complex of these countries together, namely the transformation of the economy of the countries of Eastern Europe and their agriculture from the command administrative economy to the market economy type. This situation gives the

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opportunity to identify the same elements of the development of the agrarian sector of Eastern European countries, namely: privatization processes; change of state regulation and support; active processes of formation of a new structure of enterprises, both in terms of the form of ownership and size; integration into the pan-European and world markets of food commodities; competitive struggle in the domestic and foreign markets (Csáki and Lerman, 1997; Lerman, 2009).

We note that any research, including on the development of the agroindustrial complex of Eastern European countries, faces the key issue of assigning one or another countries to the states of this region of Europe (Bański, 2008; Csáki, 2000; UN, 2004). We consider it appropriate, when assigning countries to Eastern European, to use the UN classification, where the following states are included in this region: Belarus, Bulgaria, Hungary, Moldova, Poland, Russia, Romania, Slovakia, Ukraine, Czech Republic (UN, 2004).

The problems of development of agroindustrial complex of the Eastern European countries was and is in the focus of scientific researches of both foreign scholars and scholars from these countries. In this case, it is possible to distinguish a clear chronology of studies:

- In the 90's of the 20th century, the emphasis in scientific research was on the characteristics of the agroindustrial complex and the transformation processes that were associated with the transition to market-based management mechanisms in Eastern European countries in general and their agriculture in particular. We note that scholars and relevant international institutions, such as the European Commission, have mainly investigated privatization processes, land reform and agricultural support mechanisms based on the implementation of experience of economically developed countries (European Commission, 1998; Lamb and Sremac, 1992; Swinnen *et al.*, 1997);

- In the late 1990's and early 21st century, the emphasis in scientific research shifted towards the possible accession of a part of Eastern European countries to the European Union, as well as an active study of the experience of economically developed countries, mainly EU members, in developing and maintaining agriculture. We note the emergence of a large number of domestic studies on the problems of the primary sector of the economy in Eastern Europe (Bański, 2008; Chaplin *et al.*, 2004; Csáki *et al.*, 2006; Csáki and Nucifora, 2006);

- in the first decades of the 21st century, the focus of the scholars, economists-practitioners and international organizations is on the problems of integrating the agroindustrial complex of the new EU member states from Eastern Europe (Bulgaria, Hungary, Poland, Romania, Slovakia, Czech Republic), as well as the integration of agriculture of other countries of Eastern Europe (Ukraine, Moldova) to the EU economic space and the export-import relations between these states and other countries of the world with regard to crop and livestock production (Csáki and Jambor, 2015; Dunay, 2014; FAO, 2018; Todorova, 2016).

Despite the considerable number of works of scholars, we note the meaningful discussion about the role and place of the agroindustrial complex in Eastern Europe, as well as the prospects for its development in the context of ensuring the sustainable development of the economic systems of the countries of this region of Europe, which requires additional scientific research on the above-mentioned range of problems and determines the objective of the author's research.

Proceeding from a certain goal, it is important to prove or refute a number of hypotheses, namely:

- the role of the agroindustrial complex in the economies of the countries of Eastern Europe is constantly decreasing;

- state support for agriculture in Eastern Europe is insufficient and needs to be reorganized;

- the agroindustrial complex in the countries of Eastern Europe does not function efficiently and has a significant set of problems, which does not allow to fully realize its potential;

- agriculture in the countries of Eastern Europe needs a search and implementation of a set of ways to increase the efficiency of its operation and development in the context of supporting the sustainable development of these states.

2. Materials and Methods

To achieve the objective of the research paper, a system of general scientific research methods and research methods at the empirical and theoretical levels was used, namely: a comparison method for conducting research on the quality and effectiveness of state support for agricultural production in Eastern European countries; methods of analysis and synthesis for the identification of trends in the development of agroindustrial complex of Eastern European countries; abstracting method for revealing problems of the agrarian industry development in the countries of Eastern Europe; the induction method to develop ways to increase the efficiency of agricultural production development in Eastern European countries; methods of systematization, grouping and logical generalization for systematization of information, drawing conclusions and scientific proposals of the research paper.

The research methodology is based on the historical and systemic approach in revealing and solving the problems of development of the agroindustrial complex of the Eastern European countries within the framework of ensuring sustainable development of both the complex and the economic systems of the states of this region of Europe.

The development of agricultural production is presented in the work as one of the main elements and key factors of the impact on food and economic security of Eastern European countries. The research is also based on the assumption that the problems of ensuring the sustainable development of the agrarian industry do not allow to fully realize the potential for increasing the competitiveness and efficiency of the functioning of individual agribusinesses, the agroindustrial complex and the economy as a whole in Eastern European countries.

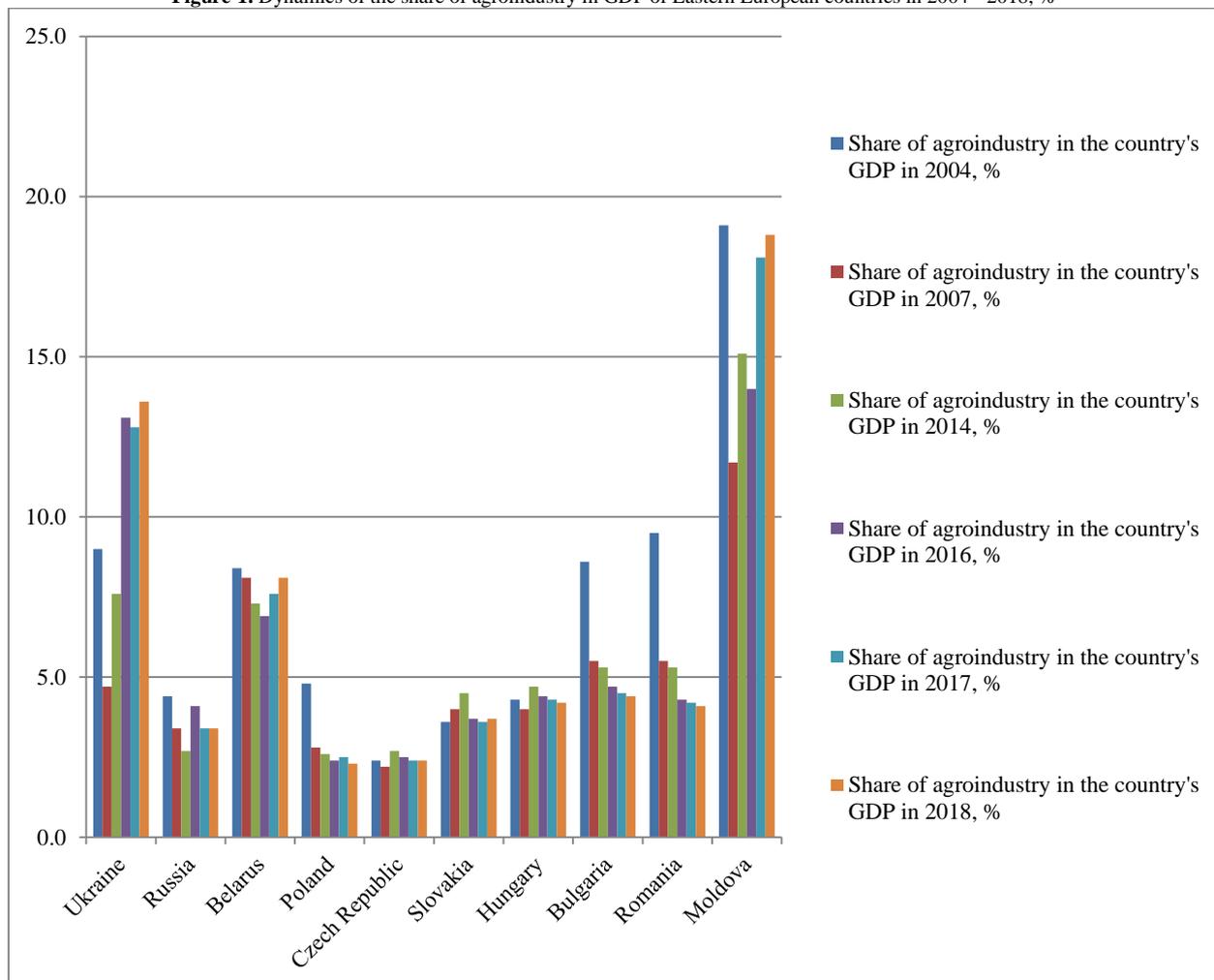
3. Results

3.1. The Role and Place of the Agroindustrial Complex in the Economy of the Countries of Eastern Europe

The current trends in the transformation of the economic systems of the countries show an increasing role of the service sector (tertiary sector) in ensuring the sustainable development and competitiveness of national economies. Instead, industry (secondary sector), and especially agriculture (primary sector) play an increasingly limited role in the economic development of states. At the same time, countries with a poorly developed economy, those who are outsiders in the world markets of products (works, services), have a high share of agriculture in gross domestic product. The study of the dynamics of the share of agroindustry in the GDP of Eastern European countries in 2004 - 2018 [Figure 1](#) allows noting:

- significant share of agroindustry in GDP of the non-EU countries, except for the Russian Federation, where the volume of agricultural production did not exceed 4.5% throughout the study period;
- increase in the share of agroindustry in GDP of countries facing significant economic crisis during the research period (Ukraine, Moldova, Belarus);
- reduction of the share of the agroindustrial complex in the GDP of the new EU member states, especially those where agriculture was significant (Poland, Bulgaria, Romania), and almost invariant share of agricultural products in GDP of those new EU member states which were more focused on industrial production (except for Hungary);
- mainly not large shares of the agroindustrial complex in Eastern Europe (not more than 4.5%), except for Ukraine (more than 13% of GDP), Belarus (more than 8% of GDP) and Moldova (more than 18% of GDP).

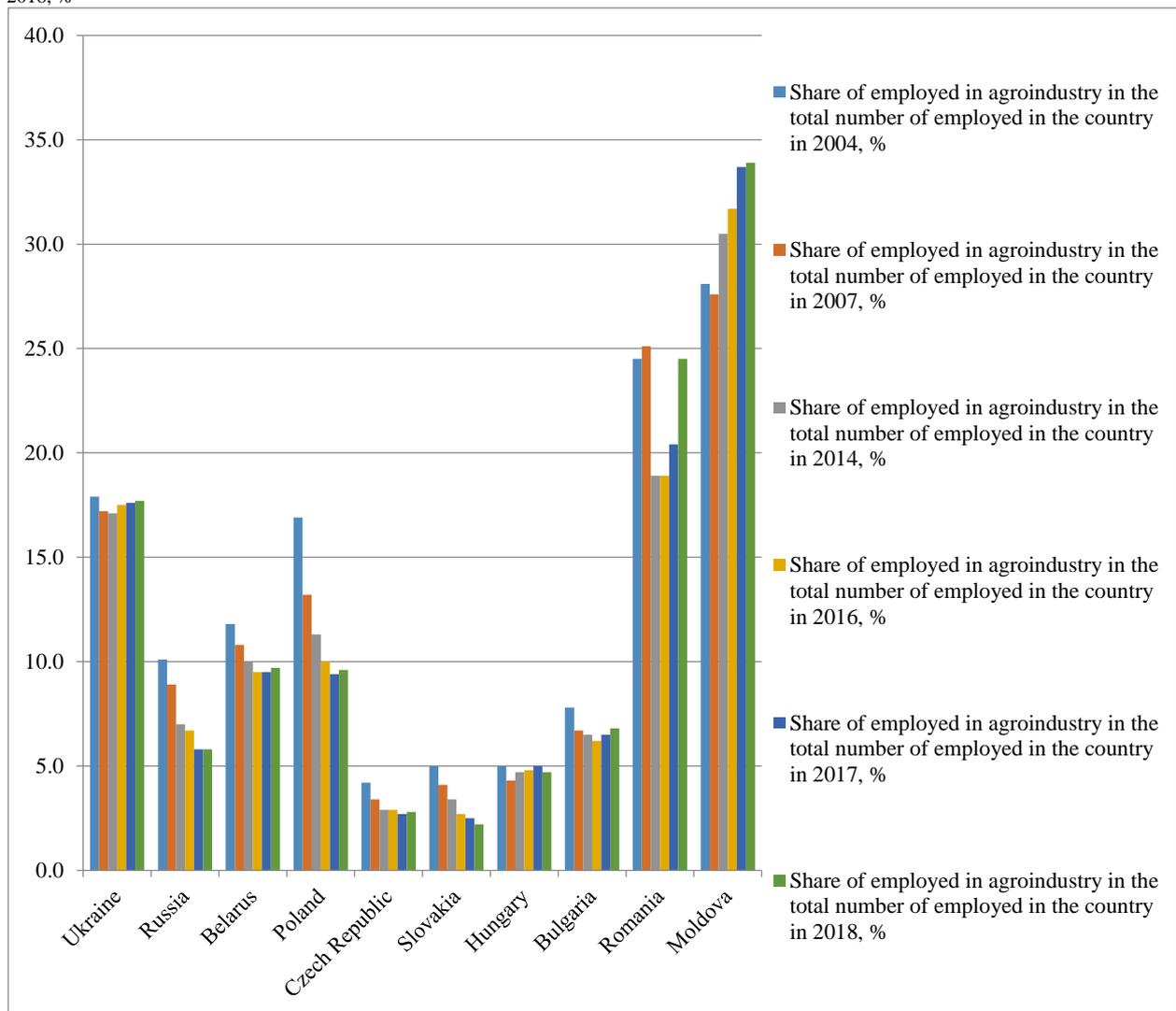
Figure-1. Dynamics of the share of agroindustry in GDP of Eastern European countries in 2004 - 2018, %



Compiled by the author based on: Eurostat (2019), National Bureau of Statistics of the Republic of Moldova (2019), National Bureau of Statistics of the Republic of Moldova (2019), Russian Federal State Statistics Service (2019), State Statistics Service of Ukraine (2019), The International Monetary Fund (2018).

We note that the time horizon was chosen to compare the state of affairs before the accession of new members to the European Union and after their accession (for Poland, the Czech Republic, Slovakia, Hungary since 2004, for Bulgaria and Romania since 2007), as well as comparison of the data obtained with the modern aspects of agroindustry development in the countries of Eastern Europe.

Historically, the agroindustry generates a significant number of jobs, which requires the study of the dynamics of the share of employed in this sector of the economy in the total number of employed in Eastern Europe during the study period [Figure 2](#).

Figure-2. Dynamics of the share of employed in the agroindustry in the total number of employed in the countries of Eastern Europe in 2004 - 2018, %

Compiled by the author based on: Eurostat (2019), National Bureau of Statistics of the Republic of Moldova (2019), National Bureau of Statistics of the Republic of Moldova (2019), Russian Federal State Statistics Service (2019), State Statistics Service of Ukraine (2019), The International Monetary Fund (2018).

Estimation of the place of the agroindustrial complex in the national economic systems of the countries of Eastern Europe from the point of view of providing employment and combating unemployment indicates that:

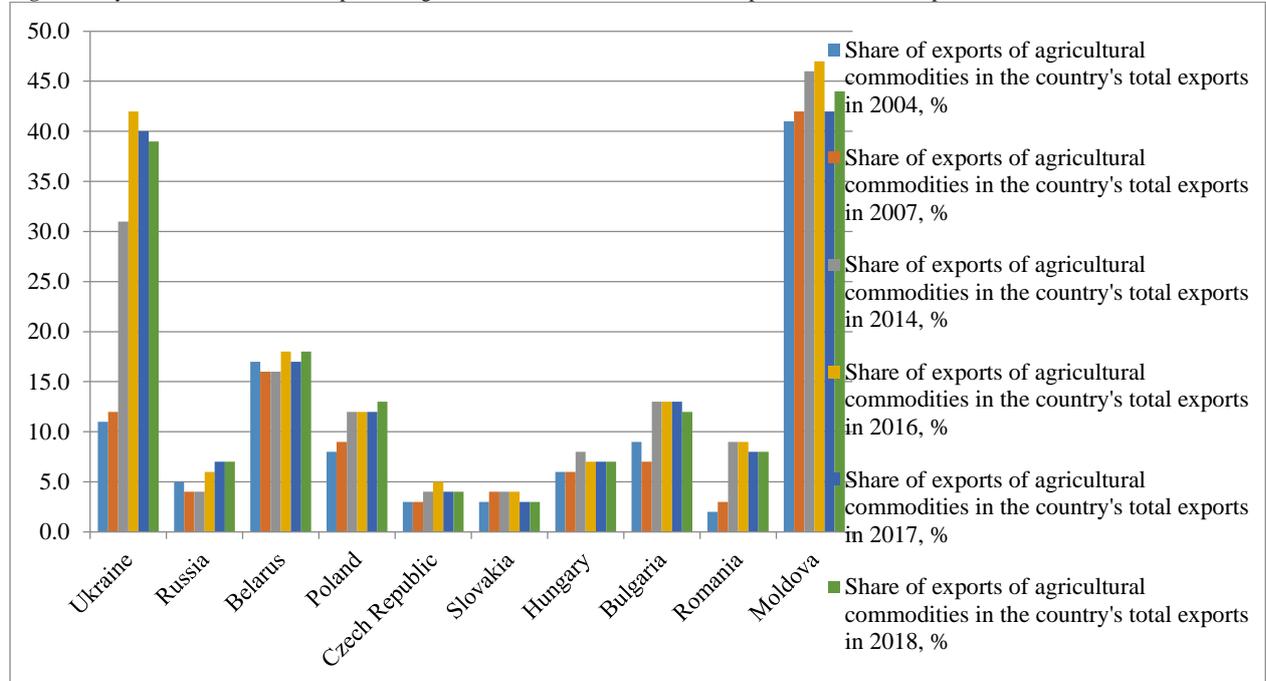
- in the vast majority of countries in Eastern Europe, the share of employed in agriculture is much larger than its GDP share, except for Slovakia and the Czech Republic;
- there is a reduction in the share of employed in the production of agrarian commodities, except for Moldova (+5.8% during the study period);
- crisis manifestations in the economy mainly do not lead to an increase in the share of employed in the agroindustry, while actively influencing the growth of the share of agricultural production in the country's GDP (see Figure 1);
- the country's economic development leads to a decrease in the share of the employed in the agrarian sector of the state.

Globalization processes and increased competition in the global and international markets for products (works, services) require increased attention to the export and import processes of the countries. The above points to the appropriateness of studying, as part of assessing the role and place of the agrarian sector in the economies of Eastern Europe, the dynamics of the share of exports and imports of agricultural products in the total volumes of exports and imports of these countries in a given time period.

The estimation of the dynamics of the share of export of agricultural commodities in the total exports of Eastern European countries during the study period Figure 3 allows noting the following:

- critically high share of export of agrarian products in the total volume of exports in the non-EU countries, except the Russian Federation, where the share of exports of such products did not exceed 7% of the country's exports;
- increase in the share of exports of agricultural commodities in the total volume of exports to the new EU member states after accession to the EU (excluding the Czech Republic and Slovakia); the share of agricultural exports in Poland's total exports since accession to the European Union has increased by 5% to 13% in 2018, in Bulgaria - by 5% to 12% in 2018, in Romania - by 5% to 8% in 2018.

Figure-3. Dynamics of the share of exports of agricultural commodities in the total exports of Eastern European countries in 2004 - 2018, %

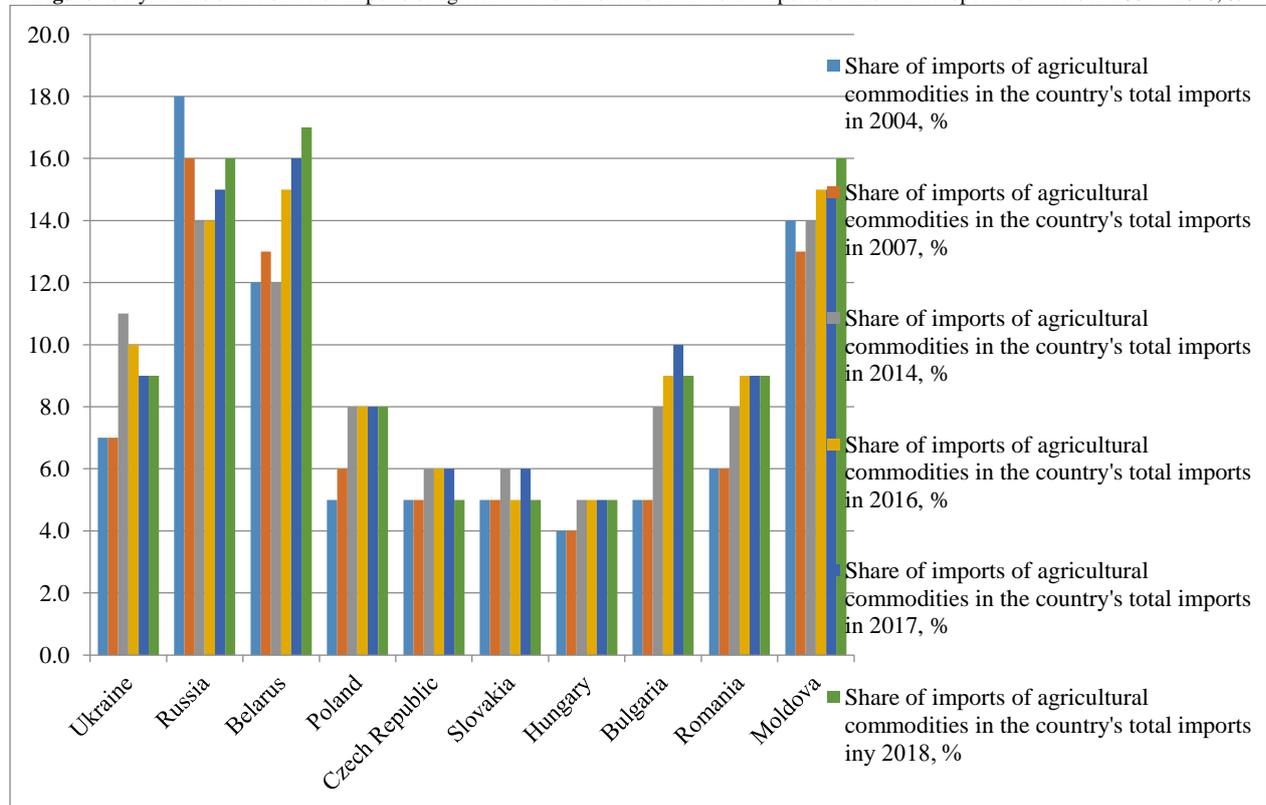


Compiled by the author based on: Eurostat (2019), National Bureau of Statistics of the Republic of Moldova (2019), National Bureau of Statistics of the Republic of Moldova (2019), Russian Federal State Statistics Service (2019), State Statistics Service of Ukraine (2019), The International Monetary Fund (2018).

Estimation of the dynamics of the share of imports of agricultural commodities in the total volume of imports of Eastern European countries during the research period [Figure 4](#) indicates the following:

- rather large share of such imports in the total imports of Eastern European countries that are not EU members, with a decrease in its share in the crisis periods of development of these countries;
- predominantly average values of the share of imports of agricultural commodities in the total imports of Eastern European countries that are new EU members. At the same time, Poland, Bulgaria and Romania, against the background of an increase in the share of exports of the agrarian sector in total exports, showed an increase in the share of imports of such products in the total volume of imports.

Figure-4. Dynamics of the share of imports of agricultural commodities in the total imports of Eastern European countries in 2004 - 2018, %

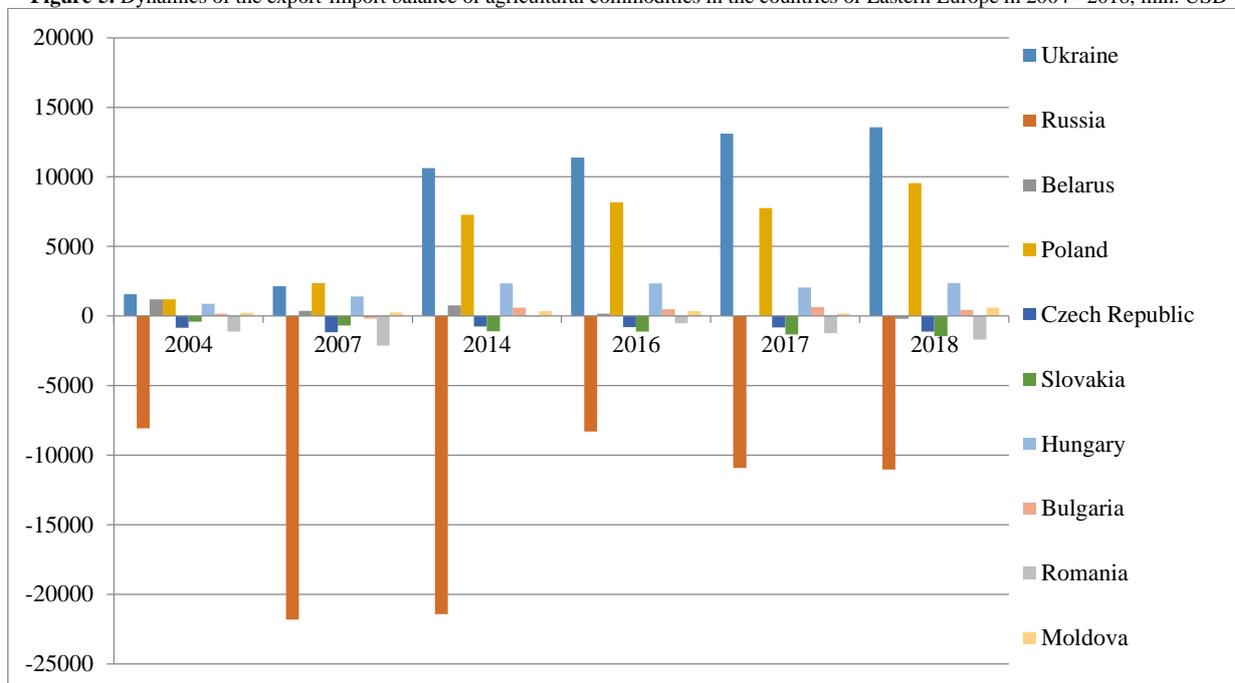


Compiled by the author based on: Eurostat (2019), National Bureau of Statistics of the Republic of Moldova (2019), National Bureau of Statistics of the Republic of Moldova (2019), Russian Federal State Statistics Service (2019), State Statistics Service of Ukraine (2019), The International Monetary Fund (2018).

The key point in terms of exports and imports evaluation is the study of its surplus/adverse balance, since a trade surplus indicates the high competitiveness of a particular enterprise, sector of economy or state economy in general and is the key to the sustainable development of such a country, and vice versa, the adverse balance points to problems with competitiveness and acts as a restraining factor for the realization of the potential of the national economy.

Evaluation of the dynamics of the balance of foreign trade operations in the agrarian sector of the economies of Eastern European countries during the research period [Figure 5](#) points to the problems in Russia, Belarus, the Czech Republic, Slovakia, Romania, a special attention should be paid to the negative trends in Belarus and Romania.

Figure-5. Dynamics of the export-import balance of agricultural commodities in the countries of Eastern Europe in 2004 - 2018, mln. USD



Compiled by the author based on: Eurostat (2019), National Bureau of Statistics of the Republic of Moldova (2019), National Bureau of Statistics of the Republic of Moldova (2019), Russian Federal State Statistics Service (2019), State Statistics Service of Ukraine (2019), The International Monetary Fund (2018).

Thus, the study of the role and place of the agroindustrial complex in the economies of Eastern Europe can be divided into three groups:

1. Countries that are not EU members (Ukraine, Belarus, Moldova), except for the Russian Federation. In the economy of these countries of Eastern Europe, the agroindustry plays a significant role and occupies one of the main places, including the provision of employment and combating unemployment, as well as the formation of foreign trade balance. Ukraine deserves special attention here, where the development of agricultural production keeps fast pace and has become the basis for the post-crisis recovery of the country's economy.
2. The Russian Federation, where the agroindustrial complex does not have a significant impact on the development of the national economy, either in terms of its share in GDP, nor in terms of the number of employees, nor export supplies. At the same time, a high share of imports of the agricultural commodities in total imports of the country is a significant destabilizing factor in its development.
3. The EU member states (Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania), where the agroindustry has a small share in the economy of the countries, with a rather limited impact on their sustainable development. The exceptions are Poland, Bulgaria and Romania, where the agrarian sector has somewhat greater influence on their economic development, employment and foreign trade activity than in other EU member states that are attributed to the Eastern European countries. Particular attention should be paid to improving the situation with the development of agricultural production after the accession of these countries to the European Union and the integration of their national agroindustry into a single economic space of the EU.

3.2. State Support of the Agroindustrial Complex in the Countries of Eastern Europe

The agricultural sector is one that receives the largest state support (Filippov, 2014). This situation has several preconditions, which include: ensuring food security of the country; increasing the competitiveness of domestic producers in the national and world market of food products; ensuring employment and entrepreneurship development, especially small entrepreneurship; the formation of an acceptable level of prices for agricultural commodities.

For the countries of Eastern Europe, the level and efficiency of state support to the agrarian sector is important, which requires the characteristics of its components [Table 1](#). We note significant differences in the state support of

the agrarian sector of the countries of Eastern Europe, which are the EU members (Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania) and non-EU countries (Russia, Ukraine, Belarus, Moldova). Russia, Ukraine, Belarus, Moldova use rather ineffective components and tools of state support for agrarian production, which rely on attracting significant financial resources of the state, thus drastically reducing the effectiveness of such support in the conditions of a constant budget deficit of these countries. At the same time, the differences in state support to the agrarian industry in the EU member states are based on their observance of the common standards of such support in the EU. There is considerable concern about the use of discriminatory aspects of state support for agricultural producers in the Russian Federation.

Table-1. Characteristics of the components of state support for the agroindustrial complex of Eastern European countries

Component of state support for agricultural production	Characteristics of the component of state support for agricultural production	Country
Approach to state regulation	Single legislative act and the branched system of additional regulatory documents	All countries of Eastern Europe
State support tools	Mainly direct (subsidies, tax remissions, licensing, quotas, administrative restrictions, direct government compensation payments, state investments, including in agricultural infrastructure)	Russia, Ukraine, Belarus, Moldova
	Mainly indirect (purchase of overpriced agricultural products and agricultural products at fixed prices, export promotion, grant support, stimulation of investment and innovation activity, free information and consulting support)	Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania
Categories of state support (according to WTO classification)	“Red box” (closure of the national market and significant restrictions in it, as well as strict protectionism)	Russia
	“Blue box” (direct subsidies to enterprises of the agroindustrial complex)	Russia, Belarus
	“Yellow Box” (predominance of direct government support instruments)	Russia, Ukraine, Belarus, Moldova
	“Green box” (predominance of indirect state support instruments)	Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania
State support model	Sectoral (support of agricultural production in the country)	Russia, Ukraine, Belarus, Moldova
	Territorial (development of agricultural production as part of the integrated development of rural areas)	Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania

Compiled by the author based on: [Filippov \(2014\)](#), [Kalachevska \(2018\)](#), [Kimhi and Lerman \(2015\)](#), [Dunay \(2014\)](#).

We consider it appropriate to use the methodology of the Organization for Economic Cooperation and Development ([OECD, 2019](#)) to further evaluate the level of state support for the agroindustrial complex in the countries of Eastern Europe. Taking into account the absence of particular EU countries, as well as Belarus and Moldova in the OECD database, we will estimate the following indicators:

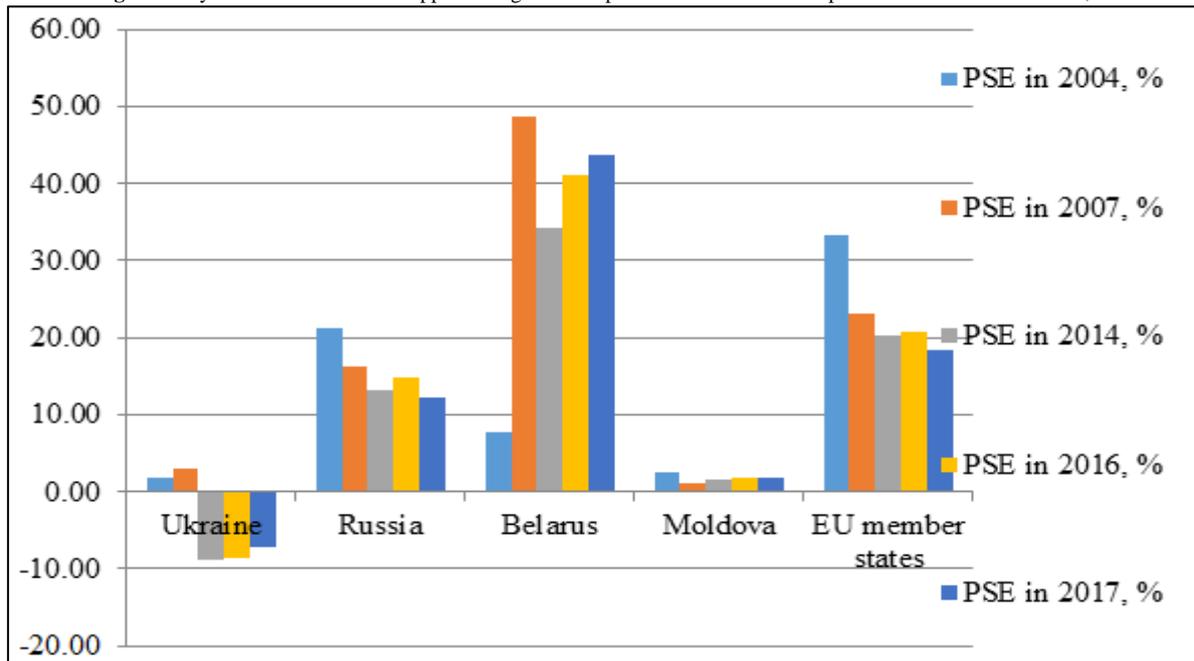
1. PSE (Producer Support Estimates, %), which determines the share of expenditures to support agricultural production in the country from the total revenue generated by the country’s agroindustrial complex. For EU member states, we will take an average PSE for the European Union, and for Moldova and Belarus we will calculate it according to the methodology of the Organization for Economic Cooperation and Development ([OECD, 2019](#)), using official statistics (National Bureau of Statistics of the Republic of Moldova, 2019; National Statistical Committee of the Republic of Belarus, 2019).

2. The Total Support Estimate (TSE) per capita level proposed by [Filippov \(2014\)](#) using the TSE indicator, calculated according to the OECD methodology ([OECD, 2019](#)). To calculate the TSE for Moldova and Belarus, we use the methodology of the Organization for Economic Cooperation and Development ([OECD, 2019](#)) and official statistics data ([National Bureau of Statistics of the Republic of Moldova, 2019](#); [National Statistical Committee of the Republic of Belarus, 2019](#)).

Using the proposed indicators will allow putting aside from the absolute values of state support for the agroindustrial complex in the countries of Eastern Europe and to obtain more objective estimates of such support in selected countries. Taking into account the lack of data on the calculation of the PSE and TSE for 2018 in the databases of the Organization for Economic Cooperation and Development, we will carry out an evaluation for the period of 2004 to 2017.

Research on the dynamics of the level of support for agricultural producers (PSE, Producer Support Estimates, %) in Eastern Europe [Figure 6](#) indicates a prevailing trend in reducing such support in Russia and the EU member states, while Belarus and Moldova increase state support for agricultural production in the conditions of growth of crisis manifestations in the economy. The situation in Ukraine is different, where the PSE indicator has been negative since 2014.

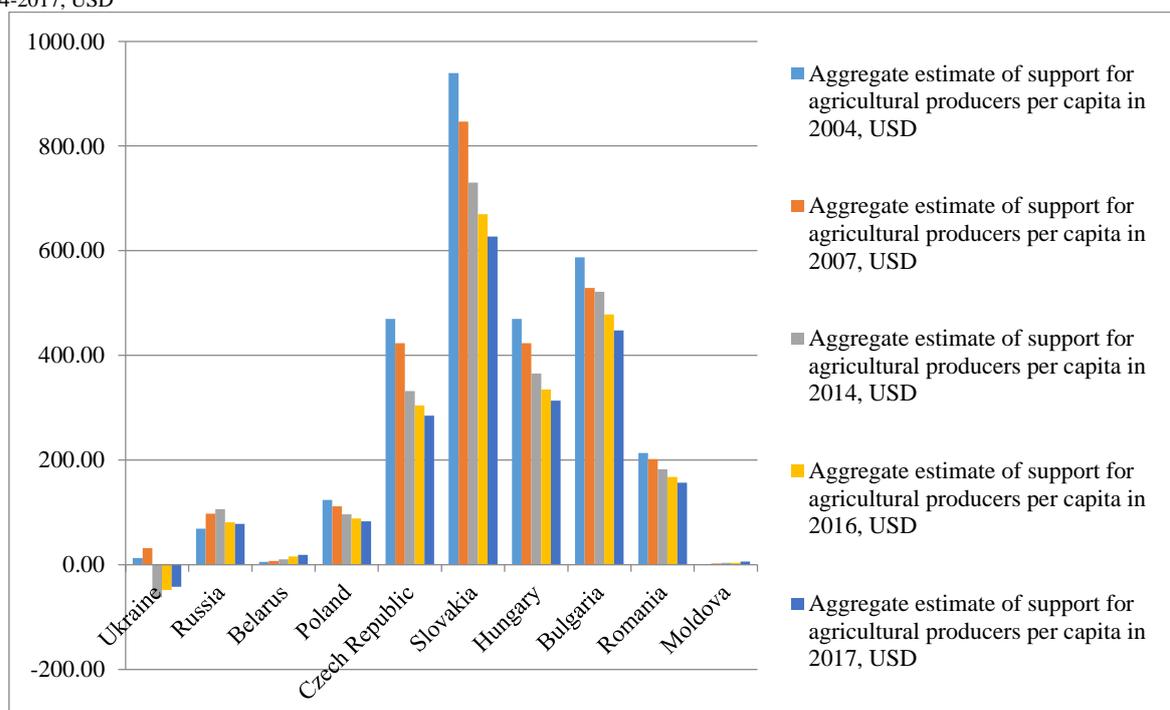
Figure-6. Dynamics of the level of support for agricultural producers in Eastern European countries in 2004 - 2017, %



Compiled by the author based on: (National Bureau of Statistics of the Republic of Moldova, 2019),(National Statistical Committee of the Republic of Belarus, 2019), (OECD, 2019).

Study of the dynamics of the level of aggregate estimate of the support for agricultural producers per capita in Eastern Europe [Figure 7](#) shows a significantly higher level of such support in the countries of the European Union than in other countries in the region and a decrease in the absolute support volumes in the research period. The exception is Belarus and Moldova, where the absolute volume of support for agricultural producers is increasing, as well as Ukraine, where support is negative.

Figure-7. Dynamics of the level of aggregate estimate of the support for agricultural producers per capita in the countries of Eastern Europe in 2004-2017, USD



Compiled by the author based on: Eurostat (2019), National Bureau of Statistics of the Republic of Moldova (2019), National Bureau of Statistics of the Republic of Moldova (2019), Russian Federal State Statistics Service (2019), State Statistics Service of Ukraine (2019), The International Monetary Fund (2018).

The estimate of state support for the agroindustrial sector in Eastern Europe suggests that the quality and effectiveness of such support are higher in the EU member states. At the same time, financing of measures to stimulate the development of agricultural production by the majority of Eastern European countries is decreasing. We note the considerable problems of the Russian Federation with this aspect of agricultural industry management in the country and the unique situation in Ukraine, where agricultural production mainly finances the development of the national economy, and not vice versa, as is the case in most countries.

3.3. Estimate of the Development of the Agroindustrial Complex in the Countries of Eastern Europe: A Methodology and Interpretation of the Results of its Application

The research of the agrarian industry in the countries of Eastern Europe raises the topical issue of estimating its development in the current conditions of functioning of the economic systems of the countries and in the historical retrospective. We note the problems with the availability of an effective methodology for assessing the development of agrarian industry in the countries of Eastern European, as the methodology developed by the Hungarian scholar Csáki and based on the indicator of progress in agricultural reform - the ECA Agricultural Reform Index (Csáki and Nash, 1998) is rather narrow and reveals only processes of transformation of agricultural production in the context of its transfer to market mechanisms. Methods of Russian scholars, such as Aglotkova (2012), Taranov and Panasyuk (2011), Zhogoleva (1995) have been approbated only in the conditions of the Russian agricultural sector and are not sufficiently developed.

The above requires the search for new approaches to the development of a methodology for assessing the development of the agroindustrial complex in Eastern Europe, where it is proposed to use the 12x12 approach, that is, the 12 basic components of the assessment, which can be maximally estimated at 12 points each. At the same time, we consider it appropriate, as part of estimate, to cover various aspects of the development of agricultural production in these countries as far as possible. The criteria for evaluating each of the selected components (Ii) should allow distinguishing one of the possible states of such a component Table 2.

Table-2. Criteria for evaluating a particular component of the agroindustrial complex development in the countries of Eastern European

$1 < I_i < 3$	$4 < I_i < 6$	$7 < I_i < 9$	$10 < I_i < 12$
Critical level of development. At this level of development, the component selected for evaluation serves as a key destabilizing factor in the sustainable development of agricultural production in the country. The country needs to develop a set of measures to address the problems of the development of such a component.	Insufficient level of development. At such a level of development, the component selected for evaluation acts as one of the destabilizing factors of sustainable development of agricultural production in the country. The country needs to intensify efforts to eliminate the problems of the development of such a component.	Sufficient level of development. At such a level of development, the component selected for evaluation is one of the factors contributing to the sustainable development of agricultural production in the country.	High level of development. At this level of development, the component selected for evaluation serves as a key factor in stimulating the sustainable development of agricultural production in the country.

Source: developed by the author.

A general estimate of the agroindustrial complex development in the countries of Eastern Europe (TRA) will be obtained using the following formula:

$$TRA \sum_{i=1}^{12} I_i \tag{1}$$

where *TRA* is a general estimate of the development of the agroindustrial complex in a particular country of Eastern Europe; *I* - estimate of one component of the development of the agroindustrial complex in a particular country of Eastern Europe; *i* - the number of components for evaluating the development of the agroindustrial complex in a particular country of Eastern Europe (in our case, there are 12).

For the effective use of TRA to evaluate the development of agrarian industry in the countries of Eastern Europe, it is necessary to rely on the criteria for such evaluation Table 3.

Table-3. Criteria for evaluation of the development of agroindustrial complex in the countries of Eastern Europe

$12 < TRA < 36$	$37 < TRA < 72$	$73 < TRA < 108$	$109 < TRA < 144$
Critical level of development. At such a level of development, agroindustry is a key destabilizing factor for sustainable economic development in the country. The country needs to change the strategy and tactics of agricultural production development.	Insufficient level of development. At this level of development, agroindustry is one of the destabilizing factors of sustainable development of the country's economy. The country needs to adjust the strategy and change the tactics of agricultural production development.	Sufficient level of development. At such a level of development, agroindustry is one of the stimulating factors for sustainable development of the country's economy. The country needs to adjust the strategy and tactics of agricultural production development to raise the level to high.	High level of development. At this level of development, agroindustry is a key stimulant for sustainable economic development in the country. The country needs control and monitoring of the strategy and tactics of agricultural production development.

Source: developed by the author.

As regards particular components of evaluation of the development of the agroindustrial complex in the countries of Eastern Europe, the following are proposed here:

1. The share of agricultural production in the country's GDP and its dynamics, which will allow evaluating the impact of such production on the state economy.
2. The share of employed in the agricultural production in the total number of employed in the country and their dynamics, which will allow evaluating the impact of such production on the level of employment and unemployment, as well as the social sphere of the state.
3. Share of exports of agricultural products in the total exports of the country and its dynamics, which will allow studying the competitiveness of national producers in foreign markets and the impact of agricultural industry on the foreign trade balance of the state.
4. The share of agricultural imports in total imports of the country and its dynamics, which will allow studying the competitiveness of national producers in the domestic market and the impact of the agricultural industry on the foreign trade balance of the state.
5. Diversification of agricultural production, exports and imports, which will allow drawing conclusions about the flexibility and adaptability of national agriculture.
6. Level of state regulation, which will reveal the influence of state institutions on the development of the agroindustrial sector of the country's economy.
7. Land ownership relations in the agricultural sector, which will identify key users of agricultural land in the country.
8. The structure of agrarian enterprises by size and the share of small farms in the total number of agrarian entrepreneurs and their dynamics, which will allow assessing the level of discrimination, concentration and flexibility of the national agrarian sector of the economy.
9. The share of the shadow market in the agrarian sector of the country's economy, which will allow assessing the effectiveness of its functioning and reserves for growth.
10. Influence of transnational corporations on agricultural production in the country, which will allow revealing the level of independence and adaptability of agrarian enterprises to the global processes in the state.
11. Development of organic products market and their share in exports and imports of food products of the country, which will allow determining prospects of development of agricultural production in the state.
12. Development and introduction of innovations, which will allow determining the level of innovation of agriculture and the prospects of its competitiveness in national and world markets for agricultural commodities.

We note that the proposed methodology: is flexible enough for the introduction of new components of evaluation, elimination or transformation of the proposed components; gives an opportunity to study trends in the development of the agroindustrial complex of both a particular country and the whole set of countries of Eastern Europe; to identify key components that have a negative or positive impact on the development of agrarian production, both in a particular country and in the Eastern European countries as a whole; makes it possible to compare the development of agroindustry in the countries of Eastern Europe between themselves and find the causes of the lag in the development of agricultural production of particular countries; allows making predictions about the development of agricultural production both in a particular country and in the countries of Eastern Europe as a whole.

We note the need to evaluate the development of the agricultural complex of the economies of Eastern European countries according to the proposed methodology [Table 4](#), using the data obtained from the previous sections of the study. We note that the components of the evaluation in [Table \(I_i\)](#) are in the order of their listing and characteristics given above.

Table-4. Evaluation of the development of the agroindustrial complex in the countries of Eastern Europe

Country	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	I ₁₁	I ₁₂	TRA
Ukraine	5	6	3	7	2	2	3	4	3	3	5	6	49
Russia	3	5	5	2	3	1	2	4	4	6	4	4	43
Belarus	6	7	5	7	3	1	2	3	7	10	4	6	61
Moldova	3	5	3	7	2	2	3	4	3	3	5	5	45
Poland	8	7	7	9	6	6	9	8	10	7	7	7	91
Czech Republic	7	8	7	7	6	6	3	6	10	8	7	7	82
Slovakia	7	8	7	7	6	6	3	6	10	8	7	7	82
Hungary	7	7	7	7	6	6	3	6	10	7	7	7	80
Bulgaria	7	7	7	8	5	5	3	5	7	6	7	6	73
Romania	6	4	5	4	5	5	9	5	7	6	7	6	69

Source: developed by the author

Taking into account the evaluation of the development of agricultural production in the countries of Eastern Europe, three groups of countries can clearly be distinguished:

1. Countries - outsiders with insufficient (close to critical) level of development of the agrarian sphere. These countries include Ukraine, Moldova and Russia. Particular attention is paid to Russia as the country with the lowest level of development of the agrarian sphere among all the countries of Eastern Europe.

2. Countries whose development of agricultural production is of concern. The values of such countries are either in the upper range of the insufficient level of development of the agricultural sector of the economy (Belarus - 61 point, Romania - 69 points), or in the lower range of the sufficient level of development of the agricultural industry (Bulgaria - 73 points).
3. Countries whose development of the agricultural sphere needs to be improved. These countries include Hungary, the Czech Republic, Slovakia and Poland, the value of the TRA index allows attributing them to states with a sufficient level of development of agricultural production. Particular attention is paid to Poland as the leader in the evaluation.

3.4. Problems in Ensuring Sustainable Development of the Agroindustrial Complex in the Countries of Eastern Europe

Agricultural production faces a considerable number of problems, and the agricultural industry in the countries of Eastern Europe is no exception. At the same time, we note both individual and common problems of ensuring the sustainable development of the production of agricultural commodities in the countries of this region of Europe, which requires their identification. We consider it expedient to divide the countries of Eastern Europe into the EU member states [Table 5](#) and all other Eastern European states when identifying problems of the development of agricultural production [Table 6](#).

Table-5. Problems of sustainable development of the agroindustrial complex in the countries of Eastern Europe - the EU member states

Country	Problems
Poland	Significant dependence on the financial assistance of the European Union. Discrimination against financial assistance to the agricultural sector within the EU. Increasing agricultural sector's dependence on agrarian transnational corporations. The loss of national producers of competition in the national and world markets. Deficiency of labour resources.
Czech Republic	Significant share of agricultural land leased. Significant dependence on the financial assistance of the European Union. Discrimination against financial assistance to the agricultural sector within the EU. Increasing agricultural sector's dependence on agrarian transnational corporations. Deficiency of labour resources.
Slovakia	High share of agricultural land cultivated by tenants. Significant dependence on the financial assistance of the European Union. Discrimination against financial assistance to the agrarian sector within the EU. Increasing agricultural sector's dependence on agrarian transnational corporations.
Hungary	Significant volumes of agricultural land leased. High dependence on financial assistance of the European Union. Discrimination against financial assistance to the agricultural sector within the EU. Increasing agricultural sector's dependence on agrarian transnational corporations.
Bulgaria	High share of agricultural land cultivated by tenants. Significant dependence on the financial assistance of the European Union. Discrimination against financial assistance to the agricultural sector within the EU. Increasing agricultural sector's dependence on agrarian transnational corporations. Low labour productivity and excessive number of workers in the agricultural sector.
Romania	Significant dependence on the financial assistance of the European Union. Discrimination against financial assistance to the agricultural sector within the EU. Increasing agricultural sector's dependence on agrarian transnational corporations. Low labour productivity and excessive number of workers in the agricultural sector.

Source: developed by the author

We note that the countries of Eastern Europe - the EU members, in the majority, have identical problems, which differ slightly from country to country, based on historical features of the formation and modern aspects of the functioning of the agrarian industry in the state.

Table-6. Sustainable development problems of the agroindustrial complex in non-EU Eastern European countries

Country	Problems
Ukraine	Significant share of agricultural land leased. High share of tilled land. The emphasis on extensive agricultural production. Low share of investment in innovation. Non-observance of scientifically grounded principles of agricultural production. Focus on the export of crop production. The prevalence of cultivating agricultural plants harmful to the soil. Increasing agricultural sector's dependence on agrarian transnational corporations.
Russia	High degree of state interference in agricultural production and violation of the principle of free competition in national markets for food products. High share of agricultural land cultivated by tenants. Low efficiency of agricultural producers. High dependence on the import of agricultural commodities.
Belarus	Prevalence of state-owned enterprises in the agricultural sector. Signs of command administrative economy in agricultural production. Focus on one export market for agricultural commodities - the market of the Russian Federation.
Moldova	Low effectiveness and efficiency of state incentives for agricultural production. Formation of a limited range of agricultural export products. Tillage for agricultural purposes by tenants. Lack of investment in agricultural production. Critically low volumes of innovations in the agricultural sector.

Source: developed by the author

Instead, the problems of agricultural production development in the non-EU countries of Eastern Europe are quite different from country to country, based on the peculiarities of the system of state regulation of the agricultural sector, its role in the national economy and historical peculiarities of development.

Thus, we can note a significant number of problems in the development of the agricultural complex of the countries of Eastern Europe, which require the development and implementation of appropriate ways of eliminating them, which should include:

1. Reforming the market of agricultural land and reducing the share of rent in the tillage of such lands. We also emphasize the importance of liberalizing the land market in the countries of Eastern Europe.
2. Formation of a significant layer of small enterprises (farms) and stimulation of the establishment and promotion of cooperatives. Ensuring elimination of discrimination against farms by large businesses and multinational corporations.
3. Elimination of disparities in support of agriculture and the transition to a “green box” and the territorial model of state support for non-EU countries of Eastern European. Reducing the share of direct financial support in favour of instruments of indirect support for agricultural production.
4. Intensification of innovative activity in the agricultural sector by attracting government and non-government incentives, as well as diversifying sources of financing for the development, purchase and introduction of innovations into agricultural production by increasing the share of funds from international organizations and households.
5. Transformation of the structure of the agricultural sector in order to increase the share of organic products in the production of agricultural products and their exports.
6. Optimization of the export and import structure of agricultural products in the context of increasing the level of food and economic security of the state.

4. Discussion

The problem of optimizing the development of the agricultural sector is one of the important aspects of improving the functioning of the economy of the countries of Eastern Europe. We note that the agrarian complex is one of those undergone the greatest reform in the states of this region of Europe and evoked a constant interest of the scientific community. The works of Csáki (2000), Csáki and Lerman (1997), Csáki and Jambor (2015), Dunay (2014), Lamb and Sremac (1992), Lerman (2009), Swinnen *et al.* (2010), laid the foundation and continued the study in the context of disclosure of the peculiarities of the development of agricultural production in Eastern Europe in the post-communist period. However, the transformation of countries, their economies, and the agricultural sphere of the states of this region of Europe required further research and verification of a number of hypotheses.

The hypothesis concerning the reduction of the role of agricultural complex in the economies of Eastern Europe has not been confirmed, as the estimate showed that in most of these countries, agricultural production occupies a certain share of GDP and foreign trade operations and did not change actively within the chosen period of the evaluation (2004-2018). Instead, in such countries as Ukraine, Moldova and Belarus, the role of the agricultural industry in national economies grew, reaching critical values in the economic systems of Ukraine and Moldova.

The assessment of the level and effectiveness of state support for agriculture in the countries of Eastern Europe has confirmed the hypothesis of its insufficient scope, discrimination, especially with regard to the EU-member states, and the need for reorganization. We emphasize the critical issues of state support in non-EU countries, especially Belarus and the Russian Federation, where the outdated tools of the command administrative economy are actively being used.

The hypothesis that the agroindustrial complex in Eastern Europe does not function effectively and has a significant set of problems that does not allow realizing its full potential has been confirmed. The study identified a set of issues for the EU-member countries of Eastern Europe and the non-EU states of this region. We note a much greater number of problems in countries of the second group.

The study allowed confirming the hypothesis that agriculture in the countries of Eastern Europe requires finding and implementing a set of ways to ensure increasing the efficiency of its functioning and development in the context of maintaining sustainable development of these countries. At the same time, this set was developed and proposed for implementation.

Taking into account the above, we may note that the purpose of the study set at the beginning of work has been achieved. The key value of the research paper is the developed methodology for assessing the development of the agroindustrial complex in the countries of Eastern Europe where an attempt has been made to link the various aspects of ensuring this development in the current conditions of both agricultural production and the economies selected for the evaluation. In this regard, some limitations can be distinguished in applying the results of this research paper, namely: the need to check the proposed methodology within a certain period of time with probable adjustments; the difficulty with taking into account individual characteristics in the context of identifying problems and developing ways to eliminate them in relation to the development of the agroindustrial complex of the countries of Eastern Europe. At the same time, the formulated restrictions do not reduce the scientific and practical value of this research paper and set the prospects for further research.

5. Conclusion

The agroindustrial complex is of high importance for ensuring the corresponding level of food and economic security of the countries. For Eastern European countries, agricultural production has a significant potential to ensure the sustainable development of their economic systems, which is not fully realized due to a set of problems. The above urges the study of the agricultural industry, its role in the economy of these countries, as well as evaluation of the level of state support and the localization of development problems.

The developed evaluation method will more clearly reveal the peculiarities of agricultural production development in Eastern European countries, identify key issues and develop effective measures for their elimination.

The practical implementation of the proposals and conclusions of this research paper should be considered in the context of their importance for increasing the efficiency of functioning and competitiveness of agricultural enterprises, the agrarian sector in general and the economies of Eastern European countries.

Prospects for further research on the basis of the scientific results of the conducted research are to determine the role and place of individual branches of agricultural production in the countries of Eastern Europe; problems of certain branches of agricultural production in Eastern European countries; ways of improving the efficiency of functioning of certain branches of agricultural production in Eastern Europe.

References

- Aglotkova, A. E. (2012). Program Targeted Management of the Regional Agro-Industrial Complex on the Example of the Sverdlovsk Region. *Agricultural and Food Policy of Russia*, 6: 19–24.
- Bański, J. (2008). Agriculture of central europe in the period of economic transformation. Available: https://www.researchgate.net/publication/237810436_AGRICULTURE_OF_CENTRAL_EUROPE_IN_THE_PERIOD_OF_ECONOMIC_TRANSFORMATION
- Chaplin, H., Davidova, S. and Gorton, M. (2004). Agricultural adjustment and the diversification of farm households and corporate farms in central europe. *Journal of Rural Studies*, 20(1): 61-77.
- Csáki, C. (2000). Agricultural reforms in central and eastern europe and the former soviet union status and perspectives. *Agricultural Economics*, 22(1): 37–54.
- Csáki, C. and Lerman, Z. (1997). Land reform and farm restructuring in east central europe and cis in the 1990's: Expectations and achievements after the first five years. *European Review of Agricultural Economics*, 24(3/4): 428–52.
- Csáki, C. and Nash, J. D. (1998). The agrarian economies of central and eastern europe and the commonwealth of independent states: Situation and perspectives. World bank discussion paper no. 387.
- Csáki, C. and Nucifora, A. (2006). Ten years of transition in the agricultural sector: Analysis and lessons from eastern europe and the former soviet union. Available: <https://services.bepress.com/cgi/viewcontent.cgi?article=1005&context=sjohnson>
- Csáki, C. and Jambor, A., 2015. "10 years of EU Membership: The Case of the NMS Agri-Food Sector." In *International Association of Agricultural Economists-2015 Conference, 9-14, August 2015*. Milan. pp. 24-26.
- Csáki, C., Kray, H. and Zorya, S. (2006). The agrarian economies of central-eastern europe and the commonwealth of independent states: An update on status and progress in 2005. World bank ecssd working paper no 46.
- Dunay, A. (2014). *Challenges for the agricultural sector in central and eastern Europe*. Agroinform Publishing House: Budapest.
- European Commission (1998). Agricultural situation and prospects in the central and eastern european countries: Summary report. Directorate-general for agriculture (dg vi): Brussels.
- Eurostat (2019). DATABASE, Information. Available: https://ec.europa.eu/eurostat/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_nPqeVbPXRmWQ&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_pos=1&p_p_col_count=2
- FAO (2018). Review of agricultural trade policies in the post-soviet countries 2016-17. Available: <http://www.fao.org/policy-support/resources/resources-details/en/c/1152540>
- Filippov, R. V. (2014). International experience in agricultural subsidization and food security in Russia. *Internet Journal of Science*, 1(20): 1–13.
- Horbańczuk, J. O. and Marchewka, J. (2017). Challenges and opportunities for the innovation and sustainability of agriculture in central and eastern europe, with special consideration of livestock sector. Available: <http://fundacijarepublikanska.org/wp-content/uploads/2017/06/HODOWLA-ANGIELSKA-do-internetu.pdf>
- Kalachevska, L. I. (2018). Features of state support to the development of rural areas: Foreign and national practice. *Black Sea Economic Studies*, 28(1): 73–78.
- Kimhi, A. and Lerman, Z. (2015). Agricultural transition in post-soviet europe and central asia after 25 years. Available: https://www.iamo.de/fileadmin/documents/sr_vol79.pdf
- Kovaltchuk, A. P., Blinova, E. A. and Miloradov, K. A. (2017). Increasing the competitiveness of the Russian hotel enterprises under modern conditions. *Journal of Environmental Management and Tourism*, VIII., 2(178): 407–16.
- Lamb, J. and Sremac, D. (1992). Central europe: Agriculture in the new market economies. *Mediterranean Journal of Economics, Agriculture and Environment*, (3/92): 34–38.
- Lerman, Z. (2009). Land reform, farm structure, and agricultural performance in cis countries. *China Economic Review*, 20(2): 316–26.
- Lobanov, M. M. and Zvezdanovich-Lobanova, E. (2017). Features of agrarian policy in the countries of central and southeastern europe in the 1990–2010's. *Economic Policy*, 12(3): 150–73.
- National Bureau of Statistics of the Republic of Moldova (2019). Statistical Information. Available: <http://www.statistica.md/index.php?l=en>
- National Statistical Committee of the Republic of Belarus (2019). Statistical Information. Available: <http://www.belstat.gov.by>

- OECD (2019). Producer and consumer support estimates database. Available: <http://www.oecd.org/tad/agricultural-policies/producerandconsumersupportestimatesdatabase.htm#tables>
- Russian Federal State Statistics Service (2019). Statistical Information. Available: <http://www.gks.ru>
- State Statistics Service of Ukraine (2019). Statistical Information. Available: <http://www.ukrstat.gov.ua>
- Swinnen, J. F. M., Buckwell, A. and Mathijs, E. (1997). *Agricultural Privatisation, Land Reform and Farm Restructuring in Central and Eastern Europe*. Ashgate: Aldershot.
- Swinnen, J. F. M., Van Herck, K. and Vranken, L. (2010). Shifting patterns of agricultural production and productivity in the former soviet union and central and eastern europe. Available: https://www.researchgate.net/publication/241763532_Shifting_Patterns_of_Agricultural_Production_and_Productivity_in_the_Former_Soviet_Union_and_Central_and_Eastern_Europe
- Taranov, P. M. and Panasyuk, A. S. (2011). A model of two-criteria analysis of the russian food market: Competitiveness and food security. *Saratov State Agrarian University Bulletin*, 8: 91–94.
- The International Monetary Fund (2018). GDP, current prices, world economic outlook. Available: <https://www.imf.org/external/datamapper/NGDPD@WEO/OEMDC/ADVEC/WEOWORLD>
- Todorova, S. (2016). Bulgarian agriculture in the conditions of the eu common agricultural policy. *Journal of Central European Agriculture*, 17(1): 107–18.
- UN (2004). *European economic survey*. Secretariat of the European Economic Commission: Geneva.
- Zhogoleva, E. E. (1995). *Methodology for developing priorities of agrarian policy of russia*. Informatics: Moscow.