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This paper considers the issue of state financial protectionism of the agricultural industry in the context of regionalization. A comprehensive methodology of state financial protectionism of the agricultural industry in the context of regionalization has been proposed, taking into consideration IPR and the value of the agricultural industry in a region. Based on statistical data on the indicators of investment attractiveness of the region (IAR) and the value of the agricultural industry in a region, regions for financing were determined. The problem of determining the fate of state financial protectionism for the agricultural industry in the context of regionalization has been stated and solved. The proposed methodology was tested by an experimental method.

It is proposed that the state financial protectionism in the context of regionalization should include budget (investment) financial injections based on the investment attractiveness of a region and the value of the agricultural industry in the region, which are directed to the agricultural sector, in order to support it.

The calculation results show that the distribution of financial resources with the available amount of public finances S=1 allocated for support is carried out proportionally. The comprehensive approach has made it possible to identify four regions for financing, and those are the regions that have the greatest value in the agricultural industry.

Practical value is for management bodies (local, territorial, etc.) in the distribution of funds according to the vector of protectionism of the agricultural industry. The theoretical value is for researchers dealing with financial support, state protectionism, and public administration

Keywords: State funding, protectionism, state support, agricultural industry, investment attractiveness

DEVISING A PROCEDURE OF STATE FINANCIAL PROTECTIONISM IN THE AGRICULTURAL INDUSTRY IN THE CONTEXT OF REGIONALIZATION

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1. Introduction

The development of each individual sector of the economy is the development of each state as a whole. Especially when it comes to agriculture – a sector of the economy that is intended to provide the population with food and obtain raw materials for industry. The industry is represented in almost all countries [1, 2].

The three world leaders in agriculture include the United States, Ukraine, and France [2, 3]. The first place belongs to the United States where 173 million hectares are cultivated;

the second place is occupied by Ukraine with almost 36 million hectares, the third – by France, which has 27.5 million hectares of sown areas. They are followed by Germany, Poland, Spain, and others. The scale of the impact of the agricultural sector on the economy of each of the states is difficult to overestimate, if possible at all. This is one of the leading sectors of the economy. In addition to the stable provision of the country's population with high-quality, safe, affordable food, agriculture is capable of making a significant contribution to solving the global problem of hunger. Its production potential significantly exceeds the needs of the

domestic market [4]. Moreover, ensuring the development of the agricultural sector directly proportionally affects the provision of the environmental component: natural resource potential, compliance with the requirements for rational nature management, and preservation of environmental components [5].

The relevance of the state financial protectionism of the agricultural industry is confirmed by the fact that the world is now facing a potential problem of the food crisis. This crisis is caused by turbulent circumstances raging on the territory of Ukraine directly and having a direct impact both on the countries of the European Space and countries around the world [3, 4]. In order to prevent catastrophic consequences, among the promising tasks of researching the activities of agricultural enterprises in the process of development of the agricultural sector as a whole is to establish specific ways of sources of financing and determine the tools that are most accessible [6]. The leaders of European countries, world leaders, are looking for ways and calling on other countries to help businesses, which are the global driving force of the economy and investment and which suffered during the crisis of 2020–2021, through the implementation of state support measures. The scientific community also supports it by proposing to solve the problem of financing exclusively through state intervention since we are talking about the need for significant capital investments [7]. This provokes solving some scientific tasks, namely: how, to whom, and how much financial resources to allocate, according to the vector of state financial protectionism of the agricultural industry.

In an era of constant challenges and turbulent events [8], support for leading sectors of the economy, including agriculture, is the primary task of each state.

However, it should be noted that all local support under such conditions is also not possible for any state. Paper [5], which proposes a practical algorithm for optimizing the agricultural sector, highlights the experience of economically developed countries in stabilizing the development of the agricultural industry and emphasizes the need to tackle and solve problems within specific regions. There is a problem with regional, territorial, or other kinds of targeted protectionism.

To summarize, on the one hand, we need financial protectionism for the agricultural industry in order to prevent a food crisis, on the other hand, the regions within which agricultural development is ensured. All this in the complex causes the need for new forms of funding [9]. We are talking about the development of the latest procedures for financial protectionism. This creates the need for advanced original methods to ensure the financial protectionism of the agricultural industry in the context of regionalization, which is a need for scientific research and determines its relevance.

2. Literature review and problem statement

The leadership of the leading countries is developing measures and calling on other countries to help agricultural business in particular [10] because this business is a global driving force both in the economic vector and in the environmental one [11]. They propose the implementation of state support measures [4]. The scientific community supports such initiatives and proposes to solve the problem of global

funding exclusively through state intervention. To do this, a number of financing methods are proposed, which are described below.

In study [12], the researchers analyzed and discussed modern financing procedures. Of course, not all but only some: intergovernmental financing, loan guarantees, public-private partnership, etc. It was concluded that the problem of global financing should be tackled not only centrally by the state but also at the regional level, that is, in those regions where support measures are being implemented. However, the cited study does not say anything about sectors of the economy, nor about regional selection, or about classifying them as "supported".

Study [13] proposes a methodology for distributing financial flows. However, the cited study is characterized by specificity – belonging to the provision of financing in the housing market. Surely, it is possible to adapt the proposed methodology to other industries. However, it completely ignored the analysis of the impact of such a component as the value of a particular sector of the economy for the state as a whole and, accordingly, its impact on the decision-making regarding financing.

It is worth noting that among researchers dealing with financial support problems, a rather popular direction is the inclusion in the methods of investment attractiveness [14].

Study [15] is also noteworthy, which addresses the problems of urban protectionism. The researchers proposed a model of state funding, which is based on its investment attractiveness. In addition, the indicator of investment attractiveness is identified as key when it comes to financing. It's hard to disagree with [15]. However, it does not propose either methods or procedures for the fair distribution of protectionism by the state, namely: to whom and how much. That is, paper [15] is theoretical and can provide answers to the above questions.

In support of the attractiveness indicator, another procedure is proposed in study [16]. In addition, the procedure is based on the vector of state protectionism using the indicator of investment attractiveness of the financing object. Everything is logical. However, it is impossible to make a decision on what to finance based on a single indicator. The indicator should not be comprehensive – the methodology should be comprehensive.

The above studies [12–16] can be grouped according to the principal approach to financing – based on a preliminary assessment with the need for an integrated approach to such an assessment [17].

Among such comprehensive procedures, one can distinguish [18, 19]. The methodology proposed in [18] focuses on the sectoral vector. However, that procedure has specificity – an innovative component, which is its fundamental component. In the context of the agricultural industry, the introduction of an innovative component that would be crucial in financing is very doubtful. The methodology [19] is also comprehensive and interesting from the point of selective financing. However, similarly to the procedure in [18], it contains an innovative component. In addition, the emphasis is on scientific institutions, the selection of which cannot be applied in the context of regionalization. Summarizing [18, 19], it should be stated that both procedures are based on selective financing. The idea of providing selective funding is also supported in study [20], in which state support and selective funding are interpreted as the

basis for the development of the latter's economies. In this aspect, study [20] is interesting – an interesting procedure of financial protectionism is proposed, which is based on a combination of private and public funds. However, here we are talking about public-private partnership and attention is paid to the procedure for determining the share participation of private financial funds. The issue of the fair distribution of public funds based on mathematical calculations was ignored.

After analyzing studies [12–20], it can be argued that the issue of state financial protectionism of the agro-industrial complex as a whole and the agricultural industry, in particular, is not considered by other researchers from the point of view of regional support. Accordingly, the issue of determining the conditions for assigning regions to investment attractive and determining the fate of state funding is not considered. This indicates the need to conduct relevant research and devise a methodology for state financial protectionism of the agricultural industry in the context of regionalization in order to support the agro-industrial complex as a whole in order to prevent a food crisis. Also an urgent issue

3. The aim and objectives of the study

The aim of this study is to devise a methodology for state financial protectionism of the agricultural industry in the context of regionalization. This will make it possible to financially support the agro-industrial complex as a whole on the part of the state.

To accomplish the aim, the following tasks have been set:
– to define the conditions for assigning regions as investment attractive ones from the point of view of state financial protectionism of the agricultural industry;
– to define the state financial protectionism of the agricultural industry in the context of regionalization;
– to determine the fate of the state financial protectionism of the agricultural industry in the context of regionalization.

4. The study materials and methods

The object of our research is the agro-industrial complex as a whole and the agricultural industry in particular, and its subject is existing procedures of their state financial protectionism. In order to solve the task of state financial protectionism of the agro-industrial complex as a whole and the agricultural industry in particular in the context of regionalization, it is proposed to employ modern computing equipment using mathematical models [18].

To obtain reliable information, the whole set of statistical data used in calculations and included in any methodology should consist of a small amount of data and be as informative as possible [19, 21].

To model the state financial protectionism of the agro-industrial complex as a whole and the agricultural industry in particular in the context of regionalization, two important indicators will be needed, namely:
1) an indicator of the investment attractiveness of a region (IAR);
2) an indicator of the value of the agricultural industry in a region in the context of state financial protectionism.

Modeling of state financial protectionism is carried out in several stages, the initial of which determines the indicator of the investment attractiveness of a region (IAR).

To determine IAR in the context of regionalization, the "Methodology for assessing the work of central and local executive authorities for attracting investments, implementing measures to improve the investment climate in the relevant sectors of the economy and regions" was applied [22]. The calculation, based on this procedure, is complex. The list of indicators included in the methodology was compiled by the Ministry of Economy. The 36 indicators (economic base of regions, economic growth parameters, investment volumes, state of fixed assets and demographic situation, and other indicators) were categorized into 4 groups: economic, infrastructure development, human resources, and entrepreneurship. In support of the adaptability of the use of the proposed methodology on the vector of state financial protectionism of the agricultural sector in particular and the agro-industrial complex as a whole, it is worth highlighting the following among the most important indicators of the economic group:
– the volume of agricultural produce (in comparable prices), million u.o.;
– gross agricultural produce per 100 hectares of agricultural land, million u.o.;
– the area of agricultural land per farm, ha.

Direct calculation is carried out in several stages.

At the first stage of IAR assessment, a rating assessment of the investment attractiveness of each region is determined by each indicator. The content of the calculation is quite simple and does not require the normalization of data, which is often used to reduce to one conditional value the values of indicators with different units of measurement.

The formula for calculation is as follows:

$$S_j = \sum((B_{max} - B_{ij})/(B_{max} - B_{min})) + \\ + \sum((B_{ij} - B_{min})/(B_{max} - B_{min})), \qquad (1)$$

where S_j is a rating assessment of the investment attractiveness of the j-th region for each indicator;

B_{ij} – the value of the i-th indicator of the j-th region, $1 <= i <= n$;

B_{max}, B_{min} – the maximum and minimum value of indicators [22].

The first part of the formula $((B_{max} - B_{ij})/(B_{max} - B_{min}))$ is used to evaluate the indicators of stimulants whose growth has a positive value, the second part $((B_{ij} - B_{min})/(B_{max} - B_{min}))$ is used to evaluate the indicators of destimulants, the growth of which has a negative value.

The calculation is performed the same number of times for all regions.

The next stage of IAR assessment is to determine the arithmetic mean of the amount of rating estimates of investment attractiveness (S_j):

$$S_{cpj} = S_j/n, \qquad (2)$$

where S_{cpj} is the arithmetic mean of the sum of the rating estimates of the j-th region by n indicators;

n – the number of indicators by which the calculation is performed (there may be less than 36 indicators declared in the methodology) [22].

In accordance with [22], the final stage of determining IAR is to adjust the resulting value $S_{\text{cp}j}$ to the value of the weight of the group of indicators (economic, infrastructure development, human resources, entrepreneurship). Since the procedure for determining the weight of groups of indicators is not given in [22], an author's decision was made to determine it by expert survey according to the following procedure:

– selection of experts;

– the preparation of questions and compilation of questionnaires;

– the construction of rules for determining the overall assessment based on the assessments of individual experts;

– work with experts;

– analysis and processing of scores provided by experts.

The quantitative method of data acquisition involved an expert survey conducted during seminars and conferences at the Faculty of Management and Business of KhNADU in 2021.

The experts represented:

– scientific circles involved in international economic relations (including scientists from Bulgaria, Lithuania, Poland, and Slovakia);

– strategic management and management of local and regional administrations, as well as urban development;

– businesses, managers of foreign companies.

The survey was conducted on a sample of 21 specialists. The structure of experts is given in Table 1.

Since the reliability of the survey results largely depends on the proper questionnaire compilation and instructions for its completion, a questionnaire was compiled (in English) of 36 indicators grouped into 4 groups, which are given in Table 2.

Table 1

Sample structure of the questionnaire survey, %

Area	Respondent percentage at N=21
Science	57
Business	24
Governance	19

The construction of rules for determining the overall assessment is based on the assessments of individual experts.

The group of indicators, which is considered the most significant, is assigned the highest score (four), and the smallest – the smallest (one). It should be noted that the experts were provided with groups with indicators so that they could fully understand.

The expert survey was conducted as follows: with the help of a series, evaluate the values of a certain group of indicators compared to other groups.

The results of the survey are given in Table 3.

The survey data processing was conducted in the sequence described below.

Table 2

List of indicators for determining IAR [14]

Group	Indicator
Economic	Gross regional product per capita, million u.o. Profit received by enterprises from regular activities before taxation, million u.o. Volume of agricultural produce (in comparable prices), million u.o. Share of innovative and active enterprises, %. Gross agricultural produce per 100 hectares of agricultural land, million u.o. Area of agricultural land for one farm, ha. Retail turnover of enterprises on average per month per capita, million u.o. Volume of rendered non-financial services to consumers per capita, million u.o. Actual investments in fixed assets per capita, million u.o. Actual investments in fixed capital at the expense of foreign investors, million u.o. Ratio of unprofitable enterprises to the total number of enterprises, %. Volume of construction works, million u.o. Growth rate (decrease) of overdue payables, %. Increase rate (decrease) of overdue receivables, %. Total exports per capita, million u.o. Increase in foreign direct investment per capita over the period, million u.o. Foreign direct investment per capita at the end of the period, million u.o. Volume of investments from the regions in the economy of other countries per capita, million u.o.
Infrastructure development	Total volume of cargo transportation, thousand tons Total passenger traffic, thousand people Provision of household phones for 100 families, units Total innovation costs for technological innovations, million u.o. Applications for the invention submitted by legal entities, subdivisions, million u.o. Number of Internet users (contract), thousand people
Human resources	Commissioning of housing by developers of all forms of ownership, thousand m². Wage arrears on average per employee, million u.o. Level of economic activity of the population aged 15–70, %. Average monthly nominal salary of one full-time employee, million u.o. Unemployment rate (according to the methodology of the International Labor Organization), %. The level of employment of the registered unemployed population, %. Graduation by higher educational institutions of I and II levels of accreditation, thousand people. Graduation of higher educational institutions of III and IV levels of accreditation, thousand people
Entrepreneur-ship	The average annual number of employed employees of small enterprises with the number of employed workers in general at enterprises as business entities, thousand people. Volume of sold products (works, services) of small enterprises, %

Table 3

Ranking matrix

Indicator group		Number of experts					Total ranking	Standard deviation, Δ	Total standard deviation, $S=\sum\Delta^2$
		1	2	...	j	m			
1	X_1	a_{11}	a_{12}	...	a_{1j}	a_{1m}	$\sum a_{1j}$	Δa_{1j}	Δa_{1j}^2
2	X_2	a_{21}	a_{22}	...	a_{2j}	a_{2m}	$\sum a_{2j}$	Δa_{2j}	Δa_{2j}^2
...	...	...	...	...	...	...	...	...	...
к	X_k	a_{ij}	a_{ij}	...	a_{ij}	A_{km}	$\sum a_{kj}$	Δa_{kj}	Δa_{kj}^2
Total		$\sum_{i=1}^{k} a_{ij}$	$\sum_{i=1}^{k} a_{ij}$	...	$\sum_{i=1}^{k} a_{ij}$	$\sum_{i=1}^{k} a_{1m}$	$\sum_{i=1}^{k}\sum_{j=1}^{m} a_{ij}$	–	$\sum_{i=1}^{k} \Delta a_{km}^2$

At the first stage, the sum of the ranks assigned by each expert according to a certain indicator was determined:

$$\sum_{j=1}^{m} a_{ij} = a + a_i + ... + a_{ij} + ... + a_{im}, \qquad (3)$$

where a_{ij} is the rank assigned to the i-th group of indicators by the j-th expert;

m is the number of experts.

In addition, the author determines the deviation of the sum of the ranks of each group of indicators from the average:

$$\Delta = \sum_{j=1}^{m} a_{ij} - \sum_{i=1}^{k}\sum_{j=1}^{m} a_{ij} / k, \qquad (4)$$

where k is the number of groups of indicators.

The next step is to find the squares of deviations of the sum of ranks from the average (Δ^2) individual factor. Assessment of the consistency of expert opinions is carried out using a coefficient of conformity, which is calculated:

$$W=\sum\Delta^2/((m^{2}*(k^{3}-k)/4), \qquad (5)$$

where W is the consistency factor;

$\sum\Delta^2$ – the sum of the standard deviation of the sum of the ranks of each group of indicators;

m is the number of experts;

k is the number of groups of indicators.

The consistency ratio varies from 0 to 1. The greater its value, the more consistent the opinion of experts.

All indicators from the "Methodology for assessing the work of central and local executive authorities for attracting investments, implementing measures to improve the investment climate in the relevant sectors of the economy" are open data from the State Statistics Service of Ukraine.

The next stage of modeling state financial protectionism is to determine the indicator of the value of the agricultural industry in a region. To determine it in the context of state financial protectionism, we use data from Landlord – the Ukrainian Business Journal on Agribusiness [23]. This is a rating of the regions in Ukraine by the cost of state-owned agricultural land plots. Landlord compiles its ratings based on the calculations using data from the state enterprise "CETAM" of the Ministry of Justice of Ukraine [24] on the results of open electronic auctions OpenMarketLand for the right to lease plots of state agricultural land. The rating takes into consideration data on rental prices, generalized from almost 3,000 auctions.

The results of the data summary are given in Table 4.

The methodology of state financial protectionism of the agricultural industry in particular and the agro-industrial complex as a whole in the context of regionalization is pro-posed, which is based on the IAR indicators and the value indicator of the agricultural industry of the region.

Table 4

The main indicators of rating the regions of Ukraine for determining the value indicator of the agricultural industry of the region

Oblast	Area of agricultural land, ha	Cost of 1 ha, u.o.	Total cost, million u.o.	
			million u.o.	%
Vinnyts′ka	2,014,000	61,000	22,936	8.0761
Volyns′ka	1,048,700	15,000	3,945	1.3891
Dnipropetrovs′ka	2,581,500	49,000	20,286	7.1430
Donets′ka*	2,047,000	18,000	6,084	2.1423
Zhytomyrs′ka	1,601,000	40,000	10,280	3.6198
Zakarpats′ka	470,200	12,000	1,296	0.4563
Zaporiz′ka	966,000	24,000	5,424	1.9099
Ivano-Frankivs′ka	645,000	37,000	6,253	2.2018
Kyyivs′ka	1,434,000	35,000	9,765	3.4384
Kropyvnyts′ka	2,045,000	71,000	28,187	9.9251
Luhans′ka*	1,955,600	31,000	7,223	2.5433
L′vivs′ka	1,240,000	42,000	14,910	5.2501
Mykolayivs′ka	2,060,700	41,000	11,398	4.0134
Odes′ka	2,594,500	41,000	18,819	6.6265
Poltavs′ka	2,100,000	66,000	31,416	11.0621
Rivnens′ka	930,000	14,000	1,890	0.6655
Sums′ka	1,700,000	27,000	9,207	3.2419
Ternopil′s′ka	1,048,700	34,000	5,542	1.9514
Kharkivs′ka	2,414,000	32,000	11,424	4.0226
Khersons′ka	1,970,600	27,000	6,345	2.2342
Khmel′nyts′ka	2,100,000	60,000	13,800	4.8592
Cherkas′ka	1,456,400	59,000	14,691	5.1729
Chernivets′ka	469,700	38,000	3,230	1.1373
Chernihivs′ka	2,068,400	47,000	19,646	6.9177

*Note: * – data on the region controlled by Ukraine*

5. Results of devising the methodology of state financial protectionism of the agricultural industry in the context of regionalization

5. 1. Defining the conditions for assigning regions as investment attractive in the context of state financial protectionism

To support the agricultural industry in the context of regionalization, it is proposed to introduce state financial protectionism. State financial protectionism in the context of regionalization is considered, within the framework of this

study, as budget (investment) financial injections that are directed to the relevant sector of the economy of a particular region. Therefore, it is necessary to answer the question: which regions are investment attractive from the point of view of state financial protectionism of the agricultural industry.

In this study, we are talking about the agricultural industry and its support using indicators of investment attractiveness of the region and the value of the agricultural industry of the region.

To this end, the authors hypothesize that the program of state financial protectionism consists of n regions that require financial investments in the agricultural sector. The index of the sector of the economy involved in financing processes is denoted $i=\overline{1,n}$. Let the return on investments in the region per unit of financial means spent be a_i (a_i cannot be <1).

We offer a description of the model of effective cooperation between the region and the financial donor (state, investor, etc.), which can be represented in the following form:

$$Z_i(S_i,x_i)=\varphi_i(S_i)-y_i=\varphi_i(S_i)-(S_i-x_i), \ i=\overline{1,n}, \qquad (6)$$

where S_i is the total amount of funding directed to the development of the region;

$\phi_i(S_i)$ is the income of the i-th region;

x_i is the amount of financial resources of the region to support – borrowed funds;

y_i is the financial means of the region;

z_i is the investments of a financial donor (state, investor, etc.), which takes into consideration the amount of financing of the region;

Z_i is the net profit of the region as part of its own financial means (as part of y_i).

Under the conditions $\varphi_i(S_i)>x_i+y_i+z_i$ or $\varphi_i(S_i)/(x_i+y_i+z_i)>1$, the model of cooperation between the region and the financial donor (state, investor, etc.) is considered effective. The use of financing of regions in the context of supporting the agricultural industry, in particular, optimizes the financing process, contributes to improving the efficiency of the agro-industrial complex as a whole.

In addition, for calculations according to the proposed author's methodology, one will need a synthetic (artificial) indicator q_i, which is calculated from (7):

$$(1-a_i)/l_i=q_i, \qquad (7)$$

where a_i is the efficiency estimated by the return from the region per unit of financial means spent on supporting the agricultural industry;

l_i is a priority.

Substituting in formula (7), instead of the performance indicator, the IAR indicator for the state – r, and instead of the priority indicator, the value indicator of the agricultural industry of the region – R, the calculation of the artificial (synthetic) indicator q_i was carried out using (8):

$$(1-r_i)/R_i=q_i, \qquad (8)$$

where r_i is the IAR indicator, u. o.;

R_i is the indicator of the value of the agricultural industry of the region, u. o.

To determine the number of regions of the State that can qualify for financing in order to support the agricultural industry, the following maximum value of n is determined, which would satisfy the following inequality:

$$q_i<Q_n/(n-1), \qquad (9)$$

where Q_n is the sum of synthetic indicators q_i of the corresponding regions n.

When condition (9) is not met, the calculation ends, and the following regions are excluded from the list of candidates for financing.

5. 2. Determining state financial protectionism of the agricultural industry in the context of regionalization

Based on the statistics given in Table 2, which are publicly available, and by means of the methodology described in chapter 4, we determined IAR.

The results of our calculations demonstrated the consistency of expert assessments since their values are within 0.79–0.97. The results of the calculation of weight indicators are given in Table 5.

Table 5

Weighting factors of groups of indicators for determining IAR

Indicator group	Weight coefficient
Economic factors	0.262848
Infrastructure development	0.234772
Human resources	0.247737
Entrepreneurship	0.254643

Since this study is carried out on the example of Ukraine, the values of IAR are given for the regions of Ukraine. We represent information in the form of a consolidated Table 6.

Table 6

Summary table of IAR indicators (r_i) and the value of the agricultural industry in a region (R_i)

Oblast	r_i, u.o.	R_i, u.o.
Vinnyts′ka	0.408514	8.0761
Volyns′ka	0.355415	1.3891
Dnipropetrovs′ka	0.422116	7.1430
Donets′ka*	0.458794	2.1423
Zhytomyrs′ka	0.369553	3.6198
Zakarpats′ka	0.374684	0.4563
Zaporiz′ka	0.405340	1.9099
Ivano-Frankivs′ka	0.373391	2.2018
Kyyivs′ka	0.406496	3.4384
Kropyvnyts′ka	0.383469	9.9251
Luhans′ka*	0.403544	2.5433
L′vivs′ka	0.356200	5.2501
Mykolayivs′ka	0.398673	4.0134
Odes′ka	0.396466	6.6265
Poltavs′ka	0.410794	11.0621
Rivnens′ka	0.361749	0.6655
Sums′ka	0.376327	3.2419
Ternopil′s′ka	0.352696	1.9514
Kharkivs′ka	0.395974	4.0226
Khersons′ka	0.377155	2.2342
Khmel′nyts′ka	0.363777	4.8592
Cherkas′ka	0.398636	5.1729
Chernivets′ka	0.431203	1.1373
Chernihivs′ka	0.363765	6.9177

*Note: * – data on the region controlled by Ukraine*

Based on our data and in order to further calculate the fate of the state financial protectionism of the agricultural industry, it is necessary to proceed to the calculation of the artificial indicator q_i.

5. 3. Determining the fate of state financial protectionism of the agricultural industry in the context of regionalization

The calculation of q_i is based on (8). In determining the fate of the state financial protectionism of the agricultural industry in the context of regionalization, according to the proposed author's methodology, it is necessary to place the applicant regions in ascending order based on the q_i value. The results of calculations in ascending order are given in Table 7.

Table 7

The q_i values in ascending order

Oblast	The value of q_i
Poltavs′ka	0.053263
Kropyvnyts′ka	0.062118
Vinnyts′ka	0.073239
Dnipropetrovs′ka	0.080902
Odes′ka	0.091079
Chernihivs′ka	0.091972
Cherkas′ka	0.116253
L′vivs′ka	0.122626
Khmel′nyts′ka	0.130932
Mykolayivs′ka	0.14983
Kharkivs′ka	0.150158
Kyyivs′ka	0.172611
Zhytomyrs′ka	0.174166
Sums′ka	0.192379
Luhans′ka*	0.234521
Donets′ka*	0.252628
Khersons′ka	0.278778
Ivano-Frankivs′ka	0.284589
Zaporiz′ka	0.311357
Ternopil′s′ka	0.331713
Volyns′ka	0.464031
Chernivets′ka	0.500129
Rivnens′ka	0.959055
Zakarpats′ka	1.370405

Note: * – data on the region controlled by Ukraine

The algorithm of the procedure for determining regions – applicants for state financial protectionism of the agricultural industry – can be represented by inequality (9).

Verification of meeting the predefined condition for the set of obtained q_i values should be carried out as long as condition (9) is satisfied. The calculation results are given in Table 8.

Table 8

Check of meeting inequality (9)

The number of regions, n	q_i	$\sum q_i$ corresponding n, Q_n	$Q_n/(n-1)$	Check of meeting inequality (9)
2	0.0621	0.1154	0.1154	$0.1154 > q_2$
3	0.0732	0.1886	0.0943	$0.0943 > q_3$
4	0.0809	0.2695	0.0898	$0.0898 > q_4$
5	0.0911	0.3606	0.0902	$0.0902 < q_5$

Since condition (9) is not met at $n=5$, the calculations stop. This means that 4 regions match the state financial protectionism of the agricultural industry. The following is a calculation of the fate of the state financial protectionism of the agricultural industry for each oblast, namely: Poltavs′ka, Kropyvnyts′ka, Vinnyts′ka, Dnipropetrovs′ka. The results are given in Table 9.

Table 9

The result of calculating the fate of the state financial protectionism of the agricultural industry by oblast

Oblast	The share of funding at $S=1$
Poltavs′ka,	0.2961
Kropyvnyts′ka	0.2420
Vinnyts′ka	0.2304
Dnipropetrovs′ka	0.2315

As evidenced by the calculations given in Table 9, 4 oblasts (namely: Poltavs′ka, Kropyvnyts′ka, Vinnyts′ka, Dnipropetrovs′ka) could receive state financial protectionism in the agricultural industry, the value of which would be 29.61 %, 24.20 %, 23.04 %, and 23.15 %, respectively, of 100 % S.

6. Discussion of results of devising the methodology of state financial protectionism of the agricultural industry in the context of regionalization

A large number of financing procedures have been proposed by researchers of our time [12–20]. All of them are integrated and complex: some contain a significant number of components for calculation, others – on the contrary, few. The author's methodology of state financial protectionism of the agricultural industry in the context of regionalization is proposed. It is built on the basis of the obtained indicators of the investment attractiveness of a region (IAR) and the value indicator of the agricultural industry of the region and is also comprehensive. It contains an important component in the context of the deficit – financial protectionism in the context of regionalization. According to the author's definition, state financial protectionism in the context of regionalization should be understood as budget (investment) financial injections that are directed to the relevant sector of the economy. In the context of our study, we are talking about the agricultural industry, in order to support it in terms of the investment attractiveness of the region and the value of the agricultural industry in the region.

Unlike existing procedures, the author's one is aimed at supporting not only a separate sector of the economy – the agricultural industry but also the agro-industrial complex of the state as a whole. It is determined that regions that are investment-attractive and have the value of the agricultural industry in the region receive state funding. The basis is the rating of the regions of Ukraine by the cost of agricultural land owned as of 2021 and the calculation of the value of the agricultural industry of the region (Table 5). The presence of a mathematical justification for financing is also an excellent characteristic of the author's methodology of state financial protectionism of the agricultural industry in the context of regionalization.

For the purpose of state protectionism of the agricultural industry, it is proposed to introduce financing in the context of regionalization, the calculation procedure of which is given by (6) to (9). Its approbation was carried out in the

context of regionalization on the example of the agricultural industry of Ukraine.

In determining the fate of the state financial protectionism of the agricultural industry in the context of regionalization, we calculated q_i and its results were sorted from the smallest to the largest, the results of the calculations of which are given in Table 7. Next, the problem of a quantitative assessment of the fate of the state financial protectionism of the agricultural industry by regions based on an integrated approach was solved. The complexity is provided by indicators of investment attractiveness of a region (IAR) and the value of the agricultural industry of the region for 4 oblasts (namely: Poltavs′ka, Kropyvnyts′ka, Vinnyts′ka, Dnipropetrovs′ka); the results are given in Table 9.

Our results have both practical and theoretical value. The proposed methodology makes it possible to determine not only the regions but also to calculate the rate of such financing in the form of state investments, and, therefore, to solve the problem of state financial protectionism of the agricultural industry in the context of regionalization. Thus, an applied aspect of using the scientific result obtained is the possibility of improving the typical technological process of determining the rate of state financial protectionism of the agricultural industry in the context of regionalization, in particular, the state as a whole. Practical value is for management bodies (local, territorial, etc.) in the distribution of funds according to the vector of protectionism of the agricultural industry. Theoretical value takes place for researchers dealing with financial support, state protectionism, and public administration.

The main limitation of this study is that the methodology does not take into consideration the risk indicator, which for each region or country is different due to its geographical location. Further research should also be carried out taking into consideration the level of socio-economic development of each individual region or state.

7. Conclusions

1. The introduction of state financial protectionism of the agricultural industry in particular and the agro-industrial complex of the state as a whole in the context of regionalization has been proposed. When calculating the author's methodology, it is taken into consideration the IAR and the value of the agricultural industry. The basis is the rating of the regions of Ukraine by the cost of agricultural land owned by the state and the calculation of the value of the agricultural industry of the region. A formalized description of the model of effective cooperation between the region and the financial donor (state, investor, etc.) and the methodology of state financial protectionism of the agricultural industry in the context of regionalization have been proposed. Its peculiarity is the use of an indicator of the value of the agricultural industry of the region.

2. The problem of a quantitative assessment of the state financial protectionism of the agricultural industry in particular and the agro-industrial complex of the state as a whole in the context of regionalization on the basis of an integrated approach has been solved. The complexity is ensured by the indicators of investment attractiveness of the region (IAR) and the value of the agricultural industry of the region for 4 oblasts (namely: Poltavs′ka, Kropyvnyts′ka, Vinnyts′ka, Dnipropetrovs′ka). The indicators of agricultural industry value for these regions amounted to 11.0621, 9.9251, 8.0761, and 1.3891, respectively.

3. The fate of the state financial protectionism of the agricultural industry in the context of regionalization for Poltavs′ka, Kropyvnyts′ka, Vinnyts′ka, Dnipropetrovs′ka oblasts has been determined. The values of these destinies amounted to 29.61 %, 24.20 %, 23.04 %, and 23.15 %, respectively, of 100 % S (the total amount of funding directed to innovative development).

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