Systematic approach to the evaluation of state support efficiency on the basis of the integrated index

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Abstract. The authors present a new approach to the evaluation of state support efficiency in agriculture. The basis of the method is evaluation in accordance with 4 groups of indexes. Theoretical relevance of the research is determined by the contribution to the development of methods regarding the evaluation of state support efficiency. The authors apply economic and statistical methods, the method of expert evaluation, correlation and regression method, and integral method. The result of the research is a set of methods on the evaluation of the state support efficiency on the basis of the integrated index taking into consideration expert commentary. These methods give an opportunity to evaluate the influence of state support on financial and business operations on agricultural enterprises and in agricultural sector in general.

1 Introduction

Agriculture is not only a branch of world economy but also a living environment for the major part of country's population with a special lifestyle, a "farm civilization", which forms the origin of the whole nation. It helps to maintain historically acquired cultivated lands, country's cultural diversity, and economic prosperity. In order to preserve this sector and to help it survive in the challenging market environment, a state must provide steadfast support to the agricultural industry through applying different methods [3]. Agro-industrial complex of the Russian Federation includes a sector, which has robust economic and productive relationships; specializes in agriproducts manufacturing, processing and storage; provides the agricultural and processing industries with production facilities [6]. It can give an opportunity not only to provide country's population with foodstuffs but also to export agricultural products thus contributing to food supply security [8]. Agricultural organizations need state support for the establishment and development of new industries, grasp of new technologies and equipment for the saturation of the market with agricultural products, achievement of social goals. Thematic justification involves modifying country's domestic policy concerning assistance to agrarian producers to conform to World Trade Organization requirements. The objective of the research is to rationalize the methods of state support by the employment of the integrated index [7]. All this can help to shore Russian agricultural commodities market

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up, improve living conditions for rural people through the development of business entities. The developed methods for the evaluation of public funds efficiency may be useful for public authorities, agricultural organizations, and economics [10]. The government supports innovation activity in order to improve Russian economy, encourages imports phase-out to ensure the competitive ability of national products and serviced within the domestic and export market and to improve quality of life [11].

2 Methodological Framework

2.1 Conditions of the rationalization of state support methods

Among the major conditions proving the importance of the rationalization of state support methods in agriculture under current conditions, the necessity of the development of those methods and WTO adaptation can be named [9].

The research revealed that there are no common evaluation methods of regulatory economics efficiency helping to assess state's contribution to its development in modern Russian science and practice. This situation can be explained by the following reasons: the lack of unbiased information on funding, incommensurability of the appropriated funds (equipment, lease financing, grants etc.), certain data constraint etc. [3].

The author introduces a new definition of state support basing on the scientific theory synthesis. State support is a resource factor, which helps to speed up agriculture renovation and development taking into account the innovative approach focused on the enhancement of agribusiness competitive ability [12].

Operating profitability is one of the factors indicating state support efficiency. The rate of the operating profitability in agriculture financial and business operations tends to decrease. Without state support this sector would be loss-making.

2.2 The major efficiency evaluation methods

The scientists of the All-Russian Research Institute of Economics, Labour and Agricultural Systems Management and Urals State Agrarian University developed a number of methods for the analysis of the efficient use of public funds, which is defined on the basis of the correlation between the aggregate support measure and its finance result. The finance result of state subsidies is defined on the basis of the index of product introduction (gross and commercial) per 1 ruble of the expenses for its production and the volume of the aggregate support [13].

In accordance with the methods [17] introduced by O.A. Frolova and S.Yu. Petrova, state support efficiency is defined on the basis of the coefficient calculation. They suggest using of 2 indexes to calculate it: the aggregate of state support to the agricultural sector and annual net profit from the agricultural production.

Profit is the intended effect of any agricultural organization's activity. Aggregate measurement of support is a total of gross margin from agricultural products sold over the previous year and all budgetary allocations for the current year.

The methods of PRIM index developed by G.D. Snegireva and I.L. Sennikova deal with the evaluation of the factors regarding innovative environment of regions on the basis of the index approach. They can be implemented for making managerial decisions in order to develop innovative capacity management in the regions of Russia [14, 18].

There are different approaches to the definition of resources as the factors for the evaluation of the innovative capacity efficient use at the present stage of economics development [1, 16].

The other set of methods for the evaluation of state support efficiency is developed by I.A. Mironova. She introduces a set of indexes characterizing the efficiency of state support and divides them into 4 groups. The first one assesses the influence of state support on financial indicator and includes 2 indexes: expenses coverage and the percent of state support in the company revenue. Expenses coverage is the ratio of compensatory amount gained by an enterprise from the budget to cover certain expenses to the total of all expenses. The percent of state support in the company revenue is a ratio of state support for the particular period of time to the revenue of the company for the same period. The second group includes an index, which characterizes the influence of state support on the social position of the population. It helps to define to what extent the state support of agricultural enterprises affect the quality of life of those who work in agricultural sector. The third group assesses the influence of the object under study on the taxation of agricultural enterprises with the help of the coefficient of the ratio of taxes paid by agricultural organizations to the state support money obtained by enterprises. The fourth group defines the influence of state support on the level of capital investments [2].

The analyzed index groups give an opportunity to assess the influence of state support on financial and business operations at an enterprise and in the sector in general.

3 Research results

None of the methods mentioned above enables us to assess state support efficiency and its influence on financial and business operations at agricultural enterprises comprehensively. The main drawback is the lack of the result index calculation.

That is why the authors of the present article introduce a new approach to the evaluation of state support efficiency. The new methods imply the definition of 4 index groups, which assess the efficiency of state support from different sides. The first group evaluates the financial productivity and characterizes payoffs from investments of budgetary appropriations. We define the following coefficients: the coefficient indicating the efficiency of agricultural enterprises work taking into consideration the state support. It is the ratio of the gross profit from the agricultural products sale for the current year to the gross profit from products sale, budgetary appropriations of all levels for the current year. The second group of indexes defines budget effectiveness, which characterizes payoffs of funds spent on state support through taxpaying to the budgets of all levels. There is also a coefficient of the ratio of paid taxes to state support funds. The third group includes processing efficiency, which characterizes the rate of main funds renovation through state support with the help of the index of state support percentage in the total amount of permanent assets in operation. The fourth group of indexes assesses productive efficiency and defines the influence of state support on the dynamics of agricultural production volume. The authors introduce a coefficient of growth rate of gross output per 1% of state support increase.

The final stage of the new methods is the calculation of the integrated index of state support efficiency (IPegp). It is based on the definition of weighted average taking into account the significance of each criteria. The formula of the integrated index calculation is the following:

$$\text{IPegp Ker} = d(i) + R * di + Kkn * di + Kvp * di, \quad (1)$$

where, di is the significance of i -criterion/percent;

KER is the coefficient of agricultural enterprises efficiency taking into consideration state support;

Kp is the coefficient of the ratio of taxes to the amounts of money of state support;

Kkn is the coefficient of the state support percentage in the capital funds;

Kvp is the coefficient of the gross output growth rate per 1% of state support increase.

On the basis of the obtained integrated index value, the authors make a conclusion on the state support efficiency using the following value range: upon $IPegp < 0,9$ state support is not effective; upon $IPegp = 0,9 - 1,1$ state support is average; upon $IPegp > 1,1$ the rate of state support is high [9].

Having analyzed the coefficients of the state support efficiency measures in Kirov region, the authors conclude that the most significant coefficients are the first and the last. They are 0,319 and 0,373 respectively.

Table 1. The coefficients of the significance of state support efficiency in Kirov region calculated according to the expert analysis method.

Indexes	Significance coefficient
The coefficient indicating the efficiency of agricultural enterprises work taking into consideration the state support	0,319
The coefficient of the ratio of paid taxes to state support funds	0,214
The coefficient of the state support percentage in the capital funds	0,094
The coefficient of the gross output growth rate per 1% of state support increase	0,373

On the basis of the introduced methods, the authors calculated the coefficient of the integrated index of the state support efficiency for Kirov region.

Table 2. The calculation of the coefficient of the integrated index of the state support efficiency for Kirov region.

In-dexes	2008	2009	2010	2011	2012	2013	2014	2015
KEP	0,114	0,148	0,097	0,062	0,133	0,194	0,079	0,041
Kp	0,146	0,117	0,061	0,067	0,079	0,143	0,065	0,076
Kkn	0,019	0,021	0,033	0,053	0,038	0,016	0,031	0,035
Kvp	0,315	0,258	0,254	0,338	0,375	0,756	0,144	0,399
IPegp	0,594	0,545	0,446	0,520	0,624	1,109	0,320	0,550

During the period under study, the state support efficiency was observable only in 2013, which shows that public funds appropriated to agriculture support were wasted.

The authors consider drawbacks of the funds appropriation ways to be the major reasons of the inefficient use of state support. Agricultural organizations differ not only in size and operating efficiency but also in development strategies. We consider that these factors should be taken into consideration when defining the directions of state support. Therefore, OEGP methods are rational to be used upon the development of the action plan on the increase of the state support efficiency for making managerial decisions in the sphere of budgeting apportionment.

4 Conclusion

Introduced methods on the evaluation of the state support efficiency on the basis of the research results on the integrated index calculation can be used in the process of managerial decisions making in regions. It will help to allocate state support appropriately.

During the analyzed period, agricultural organizations in Kirov region functioned inefficiently even with state support funds. It can be proved by the research on different methods of the evaluation of the state support efficiency.

The authors conclude that allocated funds for agricultural enterprises in Kirov region are being wasted. The breakeven level of all financial and business operations in agricultural

organizations including subsidies tend to decline. Without state support this sector would be loss-making.

The research on different methods revealed that there is no complex set of methods. None of them help to evaluate state support efficiency and its influence on financial and business operations at agricultural enterprises comprehensively.

That is why the authors introduced 4 groups of indexes, which evaluate the state support efficiency from different sides. Then an integrated index of the state support efficiency was calculated. The approbation of the introduced methods according to the data of agricultural organizations in Kirov region lead to the conclusion that the state support efficiency was observable only in 2013 because the funding allocation was the highest compared to other periods.

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