On the issue of the effectiveness development assessment of agriculture regulation

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Abstract. The authors clarify certain theoretical provisions and developments on the practice of regulating the development and optimization of state support for the agricultural sector. Presents the author's vision of a system of relations of participants of agricultural production and executive management in agribusiness with the inclusion unit to support the dynamic growth of all levels of small, medium and large-scale production. A method for determining the economic efficiency of state support measures is proposed, which allows reducing the factors of influence of exogenous influences uncontrolled by business. The methodology for optimizing the level of state support, aimed at the final results of agricultural business, is supplemented with new criteria that form the social effect.

Keywords: large, medium, small agricultural production, development regulation, final results

1. Introduction

1.1 Relevance of the research topic

The retaliatory economic sanctions imposed by Russia against leading Western producers have reduced the supply and competition from imported products on the domestic food market. In agriculture, conditions have emerged for more effective implementation of domestic reserves of producers, increasing the scale of production, realizing the opportunities for innovative development of agricultural enterprises and increasing the productivity of agricultural enterprises. It is expected that the solution of the problem of import substitution will allow in the medium term to strengthen the domestic production base by using of advanced foreign and domestic technologies, will bring the agricultural sector to a new stage of development.

The further success of agricultural development is hindered by unequal opportunities for managing large, medium and small businesses, still high credit capital rates, unit production costs, continuing price disparity, low business efficiency, asset liquidity, high investment risks, and low financial margins. There is still a great dependence on imported seed production, plant protection technologies, insufficiently developed infrastructure, material and technical support, and weak activity of agribusiness participants in state program support projects due to their low transparency and accessibility.

Political instability, high price volatility of domestic and foreign agricultural markets increase the current natural and climatic and economic risks of agriculture. All this seriously reduces the possibilities of not only medium and long-term, but also short-term planning of investment policy, worsen the
economic condition of participants in agricultural production. The most problematic are still the blocks of starting a business and its final stage for the wholesale and retail raw materials and food, especially in the segment of small agricultural enterprises.

The relevance of this study is evidenced by the current structure of the market supply: about 40% of all agricultural products in our country are produced by small agricultural participants. In 2019, they produced 34% of meat, 37% of milk, 68% of vegetables, and 92% of potatoes in our region. But with such a high share of small business participation in the results of production and market supply, small producers of the agricultural sector receive only a little more than 10% of all support funds from the state. Such a high disparity in the distribution of state support funds, which is a consequence of the mistakes of modern agricultural policy, seriously distorts the competitive environment, hinders the more complete realization of the opportunities of small-scale production participants. These factors constrain the process of job creation, have a big negative impact on the sources of credit, the process of investment renewal of fixed assets, and the results of market activity.

The practice of overcoming constraints requires improving the existing system of state support for agriculture, restructuring the tools used for investment subsidies for the development of the entire agricultural sector. All this has led to the need for scientific research on the possibilities of further improving the level of efficiency of the process of regulating the development of the agricultural sector and the entire agro-industrial complex (AIC). These circumstances have become the driver of determining the direction of our scientific search.

1.2 State of knowledge of the problem
The theory of moderate state regulation of national economies was considered by M Farrell [1], J Hertog [2], J Keynes [3], A Laffer [4], A Marshall [5], C McConnell [6], J Schumpeter [7], et al.

Domestic practice of state regulation was studied by scientists-economists A Baydakov, A Nazarenko [8], Yu Bershitskiy [9], V Gaiduk [10], V Zhuravel, M Leshcheva [11], et al.

Various aspects of state regulation and support for the development of agricultural production, including small forms of management, cooperation are disclosed in the scientific works of Popova L [12], Gurnovich T, Agarkova L [13], Tolmachev A, Vasilieva N, Artemova E [14], et al.

Problem of improving regulation of agricultural industry remains very acute. A number of additions and provisions require modern clarification, the use of a transparent mechanism for the distribution of investments, taking into account the reduction of state budget participation in the development of the rural economy. This was the reason for choosing the goals and formulation of the tasks of scientific research.

1.3 Purpose and tasks of the research
The purpose of our study is to clarify the degree of influence of state intervention on the efficiency of agricultural business. According to the set goal, we:

– systematized the idea of the process of coordinating the actions of the state and participants in agricultural production;

– proposed a methodology for determining the effectiveness of state backing for agricultural producers, taking into account the transfer efficiency and priority of its areas.

2. Methods, scientific and practice-oriented study significance
In the course of the study system-functional analysis, monographic, analytical, graphical, structural-logical method, mathematical modeling and expert assessments were used.

The increase in knowledge should be noted in the author's systematization of the ideas of interaction between state management bodies and participants in agricultural production, with an expanded mechanism of influence on small, medium and large businesses. The state's participation in regulating the development of the AIC is designed to provide relatively equal proportions of support, create opportunities for increasing production efficiency, especially in small businesses. A new methodology for determining the economic efficiency of subsidies aimed at the evolution of the AIC is also proposed.
The practice-oriented significance of research is determined by:
– determining the social effect by the amount of future budget revenues and the number of high-performance jobs created;
– the conclusions and proposals of the research, which are recommended for use in making managerial decisions in the process of state regulation of the development of regional agriculture;
– implementation of methodological developments and proposals of the authors in the practice of agricultural organizations and program institutional regulation of agricultural development;
– the feasibility of using the main research findings during the development of the disciplines of management, marketing, studying of the mechanism of state regulation of economy in the higher education system (bachelor's, specialist's, master's and doctorate).

3. Main part

3.1 On the mechanism of regulation of agricultural production

We have proposed a model construction of the mechanism of relations between the executive power and the participants of agricultural production using a set of tools for influencing small, medium and large industry businesses, taking into account the preservation of interests. The recommended adjustments to the organizational mechanism are aimed at ensuring equal market competitive positions in relation to all its participants. At the same time, state backing is designed to increase the return of regulation to participants in large, medium and small businesses. The modern confusion of the concepts of "agricultural policy", "public administration", "state support", "state regulation" creates problems in detailing, clarifying and developing recommendations for agricultural production. In modern practice, the above definitions are often mixed without taking into account the peculiarities of a particular concept. The system of interaction between government structures and agribusiness entities is shown in Figure 1.

Figure 1. The mechanism of organization of relations between government and agricultural production entities
Pricing, which acts as a factor of financing, the formation of cash pots, and the tax system, are important elements of the above economic mechanism. Financial support of the state is a key element of state regulation; its volume has a significant impact on economic relations, while maintaining the main positions of the formation of cash flows. To a certain extent, financial subsidies are aimed at increasing the ability to adapt to the existing conditions of reproduction, while maintaining the main proportions of the equivalence of intersectoral exchange. At the same time, the tools of administration and legal regulation in the above mechanism differ significantly from the measures of economic impact, they represent a different side of the organizational mechanism.

3.2 On the assessment of effectiveness of agriculture state regulation
In our study, we clarified the methodology for determining the economic effectiveness of state support measures, which allows us to take into account the factors of influence of exogenous impacts on agricultural technologies that are not controlled by business, to take into account the transfer efficiency and priority of state support for agricultural producers. The procedure for determining economic efficiency is always associated with the target setting, quantitative and qualitative evaluation criteria. This approach allows you to more accurately take into account and evaluate the current situation in the domestic and foreign markets, make more balanced business decisions aimed at improving your competitive position.

The existing methodological practice rather poorly copes with the problem of identifying the degree of influence of the state subsidy provided on the final result of production. A more accurate assessment of the importance of state support is provided by modern econometric modeling. Subsidies in the agro-industrial complex play the role of a transfer of support, directed to additional financing of production costs, which in turn then become the means of agricultural production. Thus, additional financing creates new opportunities for restructuring, optimizing the structure of resource production, and improving the efficiency of its use. At the same time, the existing factors of production to varying degrees affect the increase in the efficiency of the process of transforming costs into the final result.

The total effect of the resources involved in production, the total resource effect \( (TRE_{it} - \text{total resource effect}) \) for a conditional time \( t \), we determine the proportion of the total output \( (Y_{it}) \) to the total production costs \( F(X_{it}) \):

\[
TRE_{it} = Y_{it}/F(X_{it}).
\] (1)

In the process of sectoral regulation of development, it is necessary to have tools for implementing and determining the effectiveness of the measures taken for this purpose. At the same time, efforts should be made to ensure the maximum possible values of the effectiveness of targeted state budget transfers. The practice of using boundary stochastic analysis makes it possible to reduce the degree of influence of uncontrolled exogenous influences on the production results. This approach allows us to use the TRE index to assess the level of impact of government participation on the effect of the final efficiency of the business.

Indicator for determining the effectiveness of scale \( RTS = \sum_j^n \epsilon_j = \sum_j^n \frac{df(Xt)}{dx_j} \) and the definition of \( \lambda_j = \frac{f_j \dot{x}_j}{\sum_k^n f_k x_k} = \frac{\epsilon_j}{\sum_k^n \epsilon_k} = \frac{\epsilon_j}{RTS} \), where \( f_j \) is the marginal product of the \( j \)-th type of resource – allowed us to transform equation (1):

\[
TRE_{it} = \frac{dlnf(Xt)}{dt} - \frac{du}{dt} + (RTS - 1) \sum_j^n \lambda_j \dot{x}_j + \sum_j^n (\lambda_j - s_j) \dot{x}_j.
\] (2)

where \( \epsilon_j \) – the total elasticity of production in relation to the change in the value of the \( j \)-th resource, \( s_j \) – structural weight of \( j \)-resource type in final expenses of the \( i \)-th production participant, \( \lambda_j \) –
optimum values of structural expenses of the \( j \)-th resource in overall costs with account of current prices and production specialties.

Note that the third component of the right segment of formula 2 assesses the importance of budget subsidies in the final result of the business. The last, fourth segment of it is associated with the factor transformation of productivity.

Detailing the overall result of the economy in the production business shows that the practice of supporting the income of participants in agricultural production requires finding effective solutions that will achieve the maximum economic transfer return. Transfer efficiency refers to the proportions of the increase in net income and the increase in public spending borne by taxpayers and consumers. The net increase in the income of producers refers to the total increase in income which arises under the influence of changes in business factors initiated by the state.

Government support for business should be targeted to create a special resource base, so all state support can be grouped into separate resource areas. Based on this, in our work, we used the elasticity coefficient as a quantitative measure of the impact of budget support on business results in the formula of the transfer efficiency of state support instruments \( Etr_k - e f f i c i e n c y ~ o f ~ t r a n s f e r \) :

\[
Etr_k = \frac{\left( \bar{Y} + \frac{d\bar{Y}}{dX_k} \times \frac{dX_k}{d\bar{Y}} \times (1 - \frac{1}{1 + \frac{\bar{S}}{\bar{S}_k}}) \right) + 0.01 \times \bar{s}_k \times \bar{S}}{0.01 \times \bar{s}_k \times \bar{S}}
\]

(3)

where \( \bar{Y} \) – sales volume, \( P; \frac{d\bar{Y}}{dX_k} \) – index of elasticity of production, taking into account subsidies of the \( k \)-th group; \( \bar{s}_k \) – the amount of subsidies, \( P/ha; \bar{S} \) – area of agricultural land, \( ha; \frac{d\bar{Y}}{dX_k} \) – the coefficient of elasticity for products with subsidies.

The coefficient of elasticity \( \frac{dX_k}{d\bar{s}_k} \) for direct investments in resources of the variable cost category, it can also be calculated from the ratio \( \frac{\bar{s}_k}{\bar{X}_k} \times \beta \), where \( \beta \) is the linear regression index of the scale of the \( k \)-th type of resources from the list of subsidized products. If the index value is higher than one, each ruble spent on subsidizing production activities will turn into a large amount of income. On investment loans, if they are subsidized, it is necessary to clarify the relationship between subsidies and the amount of capital investment disbursed.

Note that the component \( \left( \bar{Y} + \frac{d\bar{Y}}{dX_k} \times \frac{dX_k}{d\bar{Y}} \times \bar{Y} \times (1 - \frac{1}{1 + \frac{\bar{S}}{\bar{S}_k}}) \right) \) provides an estimate of the increment in the net income of production that was achieved due to subsidies directed to the reimbursement of production costs and the growth of fixed assets. For example, using the value \( 0.01 \times \bar{s}_k \times \bar{S} \) in the numerator will show that each ruble of subsidies invested in production will bring one ruble of additional income to the agricultural business.

An indicator above 1 will show the positive effectiveness of budget subsidies. With such indicators, state subsidies will increase the results of the enterprise’s work, lead to an increase in net income and profit.

An indicator above 1 will show the positive effectiveness of budget subsidies. At such levels of indications, state subsidies will increase the results of the enterprise’s work, lead to an increase in net income and profit. Our recommended methodology is able to assess the priorities of business development and the effectiveness of government subsidies. With its help, you can reduce the negative factors of production, uncontrolled exogenous impacts on the business.

4. Discussions
The interim results of the study were tested at scientific conferences in Prague, Moscow and Krasnodar. Recommendations for improving the process of regulating the development of regional agriculture were submitted for practical use to the regional executive authorities. The results of the study are also used in the educational process of the Kuban Agrarian University in the preparation of bachelors, specialists, masters and postgraduates in the specialty "Economics".

5. Conclusion

1. The level of economic efficiency of the use of state subsidies in the industrial production processes of agriculture is better determined by the ratio of profit growth to the amount of state support received. In our opinion, it is incorrect to aggregate the impact of subsidies on production growth into one value, since the efficiency of their application is influenced by the resource orientation, technological and production capabilities of agricultural organizations. In addition, the effectiveness of support tools should be determined taking into account the impact of the tax burden.

2. We propose to use the coefficient of elasticity as a quantitative measure of the degree of influence of state support on the results of production with an assessment of the transferal effectiveness of its tools. The positive impact of state support demonstrates the elasticity index above one. At these values, subsidies increase the production capacity of enterprises at the expense of an additional increase in net income. Most scientific papers regard subsidies to production as a determinant of efficiency or a certain type of resource. Our methodological approach considers them as a source of capital, which takes an active part in the sphere of production, transforming into its various means and factors.

3. Our research shows that the specific indicator of gross agricultural output per 1 rub of state support shows a decline of 34.8 % due to an overly optimistic (in our opinion) forecast of an increase in state support in the Krasnodar Territory (by 2 times by 2022 – 18.9 billion rubles). Its level, calculated by spending, in 2015 was 7.8 % – - 6.7 % in 2016. By 2022, according to an optimistic variant, support can increase to 11.7 % of production costs, sales volume growth by 44 %, profit by 59 %. Tax revenues for each ruble of subsidies may decrease by 32.8 %, which may lead to a further increase in the motivation and profitability of the agricultural business. Thanks to state support, it will be possible to create 6.3 thousand highly efficient jobs.

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