

# The Role of the state Support Mechanism in the Transition of the Agro-Industrial Complex of the Russian Federation to an Innovative Development Model

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**Abstract:** The paper examines the theoretical foundations of regulation of the agricultural and food market and studies the role of the state in this area. The article considers how the balance in the agricultural market of the Central and Far Eastern Federal Districts could be with a reduction in the impact of non-market forces from 100% satisfaction of the population's need for basic foodstuffs to almost complete removal of control. This study is based on a spatial partial equilibrium model applied to wholesale markets for agricultural products in the regions of Russia. The model was developed at the All-Russian Institute of Agrarian Problems and Informatics named after A.A. Nikonov – a branch of the Federal Scientific Center for Agrarian Economics and Social Development of Rural Areas – All-Russian Research Institute for Agricultural Economics. The model includes various scenarios that differ in the values of the recommended food consumption standards included in the calculations. The simulation gives reliable results provided that, in addition to reducing the permissible level of consumption, all other factors remain unchanged. Based on the identified trends, it is concluded that only a slight weakening of non-market forces can have a positive impact on the situation in the agricultural market of the region. The main results that may arise from such mitigation are indicated.

## 1 INTRODUCTION

In the agricultural sector of the economy, self-regulation of the market plays a key role, which is achieved through influencing the production and sale of agricultural products, as well as the level of their consumption, the relationship between supply and demand and price competition. For the effective functioning of the market mechanism of self-regulation, it is necessary to provide for well-thought-out forms of state participation. The rationale for this statement is considered in (Babkina, Puchkova, Svetlova, 2024; Babkina, Puchkova, Svetlova, 2023; Babkina, Puchkova, 2022).

The impact of government regulation and direct government involvement in the economy on business activity is undeniable. At the same time, political and social aspects are becoming increasingly important

for the global economy. In these conditions, companies need to take into account constantly changing circumstances in order to operate successfully, paying attention to both economic and non-economic factors of the external environment. Market research becomes a priority task, requiring the development of coordinated strategies to avoid potential losses.

In order to develop effective strategies, firms need to carefully consider non-market factors in addition to analyzing the market environment in which they operate. This means assessing not only the interaction of market forces, but also the political, social, and legal aspects that shape the non-market environment. Otherwise, corporate strategies may prove ineffective, since non-market factors not only affect market conditions, but also generate new business opportunities that, if ignored, will lead to lower profits.

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Modern research confirms the significant influence of government agencies on maintaining balance in the agricultural market, especially in the context of the global economic crisis (Svetlov, Shishkina, 2019).

By 1925, fixed prices were established in Soviet Russia, which, according to E.G. Yasin, served as a substitute for market regulation (Yasin, 2017). Despite the fact that state prices were inferior to market prices in terms of flexibility and responsiveness to changes in supply and demand, they allowed for the centralized allocation of limited financial, material and labor resources, which was critically important for the accelerated development and industrialization of the economy.

The artificial establishment of planned prices distorts the price system and, above all, inhibits the functioning of the market mechanism, which makes it difficult to concentrate limited resources and use them to achieve priority tasks.

In the course of economic stabilization, the development of market competition and the formation of civil society, the role of the state is gradually diminishing.

An analysis of domestic and foreign experience allows us to conclude that effective management is based on a harmonious combination of market self-regulation, state support and the influence of non-state forces that do not operate according to market principles.

In recent years, state support for the agro-industrial complex in Russia has become active, since food security is one of the main priorities of the country's agricultural policy (Minakov, 2023; Nuraliyev, 2021). According to the Ministry of Agriculture of the Russian Federation, Russia is fully self-sufficient in basic food products, with the exception of meat, milk and fish. The level of self-sufficiency in dairy products is only 73-74%.

Russian agriculture is export-oriented (Kiselev, Romashkin, Belugin, 2022). The sanctions against Russia introduced in 2022 created uncertainty for agricultural producers in matters of selling products and importing necessary equipment. Despite the fact that Russia plays an important role in ensuring food stability in developing countries, exports to Western countries are facing difficulties: payment for products is partially frozen abroad, and transportation insurance has become problematic. The situation with the import of technologies and equipment is complicated by the fact that most of the supplies were carried out from countries that are currently under sanctions. Thus, the agro-industrial complex under sanctions is experiencing difficulties both with the

export of products and with the import of technologies and means of production (Gerasimenko, 2022; Zhiryayeva, 2020).

The impact of sanctions in 2022 and subsequent years on agriculture and food security is considered in (Ibragimov et al., 2024). However, since the comparison of situations before and after the introduction of sanctions does not take into account the influence of other factors, it does not allow for an accurate quantitative assessment of the consequences. The current situation requires a detailed analysis and the development of new strategies for the development of the agro-industrial complex (Afanasyev, 2022).

Given the importance and complexity of ensuring food security in the regions of Russia, this article will substantiate the role of the state in regulating the agricultural market, and also analyze the consequences of reducing this regulation.

## 2 MATERIALS AND METHODS

Improving the efficiency of agricultural production is a key element of the system of measures aimed at increasing the innovative potential of subjects of the agro-industrial complex of the regions of the Russian Federation. In addition to optimizing the use of internal reserves, cooperation, integration, as well as participation in industry unions and associations contribute to the development of innovative potential. The economic efficiency of integration processes in the agro-industrial complex is studied in detail in the work (Babkina, Puchkova, 2020). As practice shows, at present, innovative activity in the agricultural sector of the economy is mainly concentrated in integration structures, where private investment dominates.

In this study, we use the results of modeling the impact of possible sanctions on the country's agriculture (Svetlov, 2020; Svetlov, 2023; Svetlov, 2024). To assess the impact of sanctions on the Russian agro-industrial complex, we use a spatial model of partial equilibrium in wholesale agricultural markets by region, developed by the All-Russian Institute of Agrarian Problems and Informatics named after A.A. Nikonov - a branch of the Federal Scientific Center for Agrarian Economics and Social Development of Rural Areas - All-Russian Research Institute of Agricultural Economics. In this model, the supply function based on parametric data is replaced by a model of the territorial-sectoral structure of agriculture (Svetlov, 2019; Svetlov, 2021). Previous partial equilibrium models for agricultural markets

did not allow for analysis taking into account regional characteristics (Prokopyev, 2015).

In the course of computer modeling (Svetlov, Yanbykh, Loginova, 2019; Svetlov et al. 2020), averaged data for the period 2017-2021 were used, reflecting the real state of affairs in the industry in the Central and Far Eastern Federal Districts. Several scenarios were analyzed: compliance with the recommended food consumption standards for the population for all items included in the model (except for the category "other products") - the baseline scenario, designated as "100% of recommended dose"; a decrease in recommended dose by 10%, 25% or 50%, as well as complete ignoring of these standards - scenarios "90% of recommended dose", "75% of recommended dose", "50% of recommended dose" and "no guarantees", respectively.

### 3 RESULTS AND DISCUSSION

Any socio-economic system has its own development potential, which determines the total capabilities of available resources to maintain the functioning of the system and its adaptation to changes in the external environment. The development of the agro-industrial complex is determined by a number of factors, among which the key ones are the volume and quality of land plots, natural and climatic conditions, the financial position of business organizations, the level of material and technical equipment, the quality of the workforce, the availability and degree of development of infrastructure and other similar parameters.

The agro-industrial complex of the Central Federal District, including agriculture, occupies a priority place in the economy of Russia, providing the agro-food market, food security and labor resources of rural areas. The internal food market of the district is formed due to products of its own production, supplies from other districts and imported goods. In 2023-2024, the self-sufficiency of the district in basic food products is: meat and meat products - 83%, eggs and egg products - 140%, potatoes - 95%, vegetables - 70%, milk and dairy products - 80%. Despite the high level of provision with its own products, the development of agriculture is constrained by a number of problems: insufficient structural and technological modernization of the industry, limited access of producers to the market, which needs improvement, as well as the slow pace of socio-economic development of rural areas. To maintain, strengthen and further develop agricultural

production in the Central Federal District, state support is required.

The regions of the Far Eastern Federal District are characterized by extreme agricultural conditions: permafrost is widespread over most of the territory, and average annual temperatures are negative. According to the Ministry of Agriculture of the Russian Federation, the total land area of the Far Eastern Federal District exceeds 6.2 million square kilometers, while agricultural land occupies only 18,806.3 thousand hectares, and arable land - 4,090.1 thousand hectares (Babkina, Puchkova, 2022).

In this regard, it seems relevant to study the potential equilibrium in the agricultural markets in the specified districts in the context of reducing the influence of non-market factors, including government regulation, to a minimum. The results of changes in the internal state of the agricultural market of the Central and Far Eastern Federal Districts for each of the described scenarios relative to the baseline are presented in Table 1.

Table 1: Changes in the state of the agricultural market in the Central and Far Eastern Federal Districts according to scenarios.

Indicators	100% of recommended dose	Absolute increase (decrease) by scenarios		
		75% of recommended dose	50% of recommended dose	no guarantees
<b>Production (thousand tons, million units)</b>				
<b>Central Federal District:</b>				
corn	20406	-3231	-8624	-19440
potato	2359	31	88	288
open ground	799	31	88	288
vegetables	4968	363	980	2399
milk	2402	-269	-716	-1547
cattle	2349	65	190	821
bird	10044	4921	13097	28844
egg	20406	-3231	-8623	-19440
<b>Far Eastern Federal District</b>				
corn	500	-70	-166	-377
potato	230	-9	-18	-31
open ground	126	-1	-3	-5
vegetables	445	20	62	121
milk	152	-5	-2	-5
cattle	63	21	56	109
bird	1225	300	793	1766
egg	500	-70	-166	-377
<b>Sales (consumption) (thousand tons, million units)</b>				
<b>Central Federal District:</b>				
corn	4849	-208	69	402

potato	6671	0	-7	-3390
open ground	3544	-885	-1219	-935
vegetables	591	-94	-69	1
milk	10637	25	48	107
cattle	2936	-731	-1351	-1532
bird	1968	-468	-936	-1354
egg	10238	-2560	-5120	-8700
Far Eastern Federal District:				
corn	1009	-107	-60	-55
potato	1156	-264	-419	-541
open ground	1056	-166	-263	-237
vegetables	123	-24	-20	-12
milk	2221	-7	1	15
cattle	632	-90	-116	-127
bird	416,59	-84	-149	-177
egg	2129,04	1810	-745	1122

The weakening of state guarantees has a negative impact on the production of livestock products (cattle) and grain. The weaker the role of non-market factors, the lower the output of these products. In the production of milk and poultry farm products, there is an inverse relationship with the reduction in consumption rates: when the rates are reduced, the output increases. Moreover, egg production increases almost 2-3 times, depending on the analyzed district. And it is interesting that this is happening against the background of a sharp decline in domestic sales. A similar picture is observed for such types of products as potatoes and poultry meat, only the rate of decline here is less. And milk sales, on the contrary, increase in the districts under consideration, despite the decrease in domestic production.

Analysis of the results of modeling for various scenarios shows that with a reduction in the regulatory role of the state and the elimination of the system of support for agricultural business, agricultural producers in the Central and Far Eastern Federal Districts will be forced to independently determine the direction of agricultural development, striving to minimize costs and ensure the necessary level of food security. This is evidenced by the data on the production and sales of agricultural products; for almost all types of products under consideration, there is a tendency to reduce their output and sales.

With the weakening influence of non-market factors, a significant transformation of the structure of agricultural production is observed. Labor-intensive and capital-intensive types of products are gradually being replaced by poultry products, which are characterized by lower conversion.

The reduction in production volumes in the agro-food sector will also have a negative impact on the development of innovation processes in the region,

since the scale of production of certain types of products directly affects the possibilities of introducing innovative developments and assessing the prospects for the development of agricultural production sectors.

In connection with the identified trends in the production and sale of products, we will analyze the dynamics of prices for products with a decrease in government regulation. As shown in Figure 1, in all the scenarios under consideration, there is an increase in prices for products with a decrease in consumption rates, that is, with a decrease in the role of non-market factors. The most noticeable increase in prices was recorded for open-ground vegetables, eggs, poultry and meat. At the same time, prices for potatoes, milk and sunflower are growing less intensively than their output increases and sales volumes decrease.

## 4 CONCLUSIONS

The conducted study of the impact of the weakening of non-market factors on the agricultural market in the Central and Far Eastern Federal Districts allows us to draw the following conclusions.

First, there is a significant decline in agricultural consumption from the baseline to the scenario without government support, which could potentially lead to hunger, disease, and increased mortality.

Secondly, there is a rise in food prices, as a result of which the population will face difficulties in purchasing quality food products due to limited financial resources.

Thirdly, due to the reduction in production volumes, there is a reduction in sown areas, as well as the number of workers, which can lead to an increase in unemployment and an acceleration of the outflow of population from rural areas.

Therefore, it can be argued that the role of the state in regulating the market of raw materials and food is indeed key. The state acts as a guarantor of food security for the country and regions. The Far Eastern Federal District belongs to the risky farming zone due to harsh natural and climatic conditions, low investment attractiveness of agricultural production, high wear and tear of the material and technical base and other factors. Agricultural production in different regions of the district is characterized by significant differences. If the crop production industry is capable of becoming the "engine" of innovation processes and demonstrates stable growth in gross production due to the revision of state policy, then in livestock farming the recovery rate is much lower. The contribution of the subjects of the Far Eastern Federal District to the

gross regional product is uneven. In the current conditions, ensuring the growth of agricultural production is possible through the formation of an innovative model for the development of the agro-industrial complex, in which state support mechanisms play a significant role.

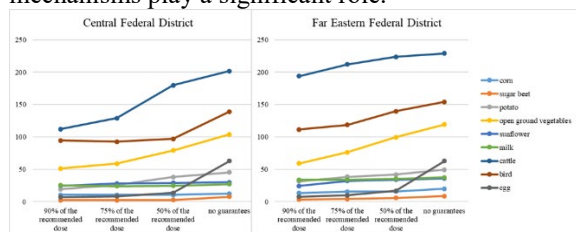


Figure 1: Change in wholesale prices by scenarios relative to the baseline, rubles per kg (rubles per piece).

Next, we will analyze the impact of the reduction in the role of state regulation on the volume of agricultural production in the Central and Far Eastern Federal Districts (Figure 2).

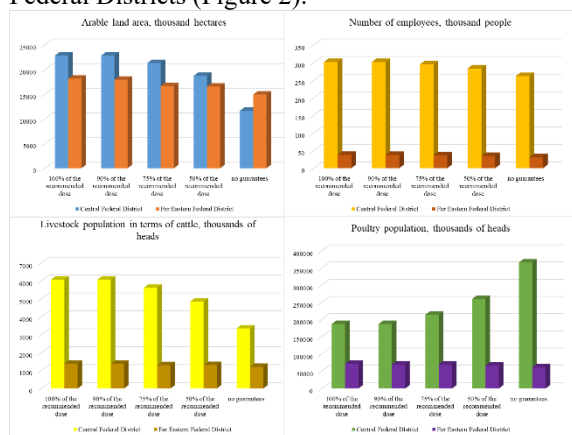


Figure 2: Change in production size by scenarios.

As can be seen from the figure, from scenario to scenario, as non-market factors weaken, including state support for the industry, there is a steady trend towards a reduction in agricultural land, which seems unacceptable for the development of the agro-industrial complex of the Russian Federation, the priority task of which is the maximum involvement of unused productive land in agricultural production.

Low concentration of land and territorial dispersion of agricultural organizations in most regions of the Far East significantly complicate the prospects for the development of integration processes and narrow the innovative potential of economic entities in the agricultural sector.

The implementation of the national project "Development of the agro-industrial complex" and target programs for the development of agriculture

and rural areas have significantly contributed to the stabilization of the situation with the reduction in the number of farm animals. The results of the modeling clearly demonstrate the importance of the role of the state in this issue. As state regulation is abandoned, until it disappears completely, the number of livestock, expressed in terms of cattle, is reduced, which, in turn, leads to a decrease in the production of livestock products and an exacerbation of food security issues in the districts.

The weakening of state support for agricultural producers has a negative impact on the state of the material and technical base of the agro-food sector in both the Central and Far Eastern Federal Districts. The cost of fixed and current assets of agricultural organizations is decreasing as food consumption standards decrease. The withdrawal of crop areas, production assets and energy capacities from economic circulation as a result of the weakening of non-market factors will lead to the disruption of the trend that has emerged in recent years to accelerate the renewal of machinery and tractor fleets in the districts.

The regions are experiencing a steady decline in the rural population. In this regard, reducing the outflow of local population has become one of the goals of the federal law of the Russian Federation "Law on the Far Eastern Hectare", which has been in force since June 1, 2016 and regulates land, forestry and other relations related to the provision of citizens of the Russian Federation with land plots in state or municipal ownership and located on the territory of the Far Eastern Federal District. The results of computer experiments show that without state support, the situation with the rural population is worsening, and the number of workers employed in agriculture is decreasing.

Thus, the conducted study demonstrates that the reduction and complete absence of non-market factors supporting the level of consumption and manifested in the activities of government bodies, support for agriculture and transportation, social responsibility of business, administrative pressure on business, price regulation, etc., has an ambiguous effect on the volumes of consumption and prices for agricultural products in the studied districts. For some types of products, an increase in production and consumption volumes is observed (eggs, poultry meat), and for others, a decrease in output with an almost unchanged level of consumption (grain, milk, meat products). A clear pattern can be traced in the dynamics of the equilibrium price for all types of products: with a weakening of the non-market impact,

it increases and reaches its maximum value in the "no guarantees" scenario.

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