

# Development of the regional agro-industrial complex in case of economic sanctions

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**Abstract.** The article examines the development of the agro-industrial complex in Russia from the point of view of the foreign trade aspect, the production aspect and the consumer aspect. By means of comparative analysis and calculation of differentiation coefficients, the degree of difference in the development of the regional agro-industrial complex in conditions of sanctions pressure is characterized. Tracking the dynamics of changes in the studied indicators made it possible to identify the positive impact of sanctions, which for most regions is expressed in a real decrease in dependence on imports of agricultural products due to a consistently implemented import substitution strategy, as well as their negative consequences, which are manifested, in particular, at the consumption level.

## 1 Introduction

Sanctions against various sectors of the Russian economy have been especially actively implemented since 2014. In August of the same year, Decree No. 560 “On the Application of Certain Special Measures to Ensure the Security of the Russian Federation” was signed. According to the above decree, the country has introduced a ban or significant restriction on the import of certain types of agricultural products, raw materials and food from countries that have imposed sanctions on Russia or joined them. The measures introduced have been extended annually and at the moment, in accordance with the decree of 11/21/2020. # 730, the restrictive measures have been extended until the end of 2021.

Thus, within the framework of these regulatory legal acts, among other things, the import substitution policy has received additional development, which is gradually gaining momentum since the first half of the 2000s, which was facilitated by the introduction of various quotas, as well as subsidies to the agro-industrial complex.

In the world economic literature, the problem of the impact of sanctions on the Russian economy has been studied in sufficient detail. In particular, in the work of M. Belin et al [1], through the use of econometric methods, an assessment is made of which sanctions had the greatest impact on the economy in 2014. V. Glinskiy et al [2] study the impact of sanctions on the development of the food and processing industry in the context of ensuring food security. General aspects of the impact of sanctions on the Russian economy are

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reflected in the works of E. Gurvich et al [3], L. Tyll et al [4], M. Seifullaeva et al [8], I. Korhonen et al [9]. Scenario conditions for the development of agriculture in Russia, the EU and Germany are presented in the work of M. Banse et al [5]. The reverse impact of sanctions on the economy of the European Union was investigated by C. Nasulea et al [6], K. Oja [12]. The impact of sanctions on agricultural production is being studied by W. Lifert et al [7]. The analysis of risks and threats to food security of the regions is carried out in the article of S. Kurbatova et al [10]. The change in the structure of imports of Russian food products from Europe is reflected in the work of Z. Kapsdorferova et al [11], W. Liefert et al [13], M. Krivko et al [14, 15].

At the same time, the development of the regional agro-industrial complex in conditions of sanctions pressure has not been studied in detail enough. In this regard, the purpose of this work is to identify the impact of economic sanctions on the development of the regional agro-industrial complex and highlight positive and negative effects.

## 2 Materials and Methods

Within the framework of this study, we will be based on the study of the main parameters of the development of the agro-industrial complex of the regions located within the two federal districts of the Russian Federation – Central Federal District and Volga Federal District. The choice of territories is due to the fact that the total share of agricultural products in these federal districts in the total volume in 2019 amounted to 49.7 % (27,2 % – share of the Central Federal District; 22,5 % – share of the Volga Federal District, respectively).

The study is based on data obtained from official sources published by the Federal State Statistics Service. In order to study the dynamics of the analyzed indicators, all calculations will be given for data characterizing the development of the agro-industrial complex in 2013 (immediately before the imposition of sanctions), as well as in 2014 (the first year during which the sanctions were imposed) and in 2019.

In the course of the research, the methods of comparative analysis, methods of statistical analysis were used. In addition, to study the degree of interregional differentiation according to various parameters of the development of the agro-industrial complex, the differentiation coefficient is used, which is the ratio of the maximum and minimum values of indicators and shows how many times the maximum value is greater than the minimum:

$$K_d = X_{\max} / X_{\min} \quad (1)$$

## 3 Results

The impact of sanctions on the development of the agro-industrial complex of territories is quite multidimensional. In our opinion, it is most expedient to consider the foreign trade aspect, characterized, first of all, by the dynamics of the balance of exports and imports of agricultural products and changes in the structure of exports and imports. In addition, the production aspect associated with changes in the volume and structure of production of the main types of agricultural products, as well as the consumer aspect, which can be characterized by the dynamics of prices and consumption of the main types of agricultural products, is of interest.

### 3.1 The impact of sanctions on the development of the agro-industrial complex of the regions: foreign trade aspect

Analysis of the foreign trade aspect of the impact of sanctions on the development of the agro-industrial complex of the regions demonstrates a rather ambiguous result. On the one hand, at the level of the country's economy as a whole, the export of non-primary goods continues to grow. In particular, in 2020, a record was set for the value of this indicator – it amounted to \$ 161.3 billion, which is \$ 6.2 billion more than the same indicator achieved in 2019. At the same time, the share of food in 2020 accounted for 17.3 % of the total volume of non-resource exports. In addition, as analysts from the Ministry of Economic Development and Trade note, the agro-industrial complex as a whole is one of the most promising and fastest growing sectors of the country's economy oriented towards export, which is clearly reflected in Figure 1.



**Fig. 1.** Dynamics of exports of the agri-food sector in Russia, Source: <https://www.economy.gov.ru/material/file/66eec1250c653fc9abd0419604f44bbd/VED.pdf>

In Figure 1, the blue line represents weight and the green line represents value. All calculated indicators are correlated with the 2010 level. As follows from the data presented, since 2014, the export of agricultural products in Russia has a steady upward trend, which is a consequence of the increase in production volumes in response to the sanctions pressure.

At the same time, if we consider the export-import balance of Russian regions by the group of food products and agricultural raw materials in dynamics in 2013, 2014 and 2019 (Table 1), then the situation does not look so unambiguous. In particular, in 2019, the export-import balance for the group of food products and agricultural raw materials both in Russia as a whole and in a number of federal districts remained negative, despite the positive dynamics in relation to the level of 2013.

As follows from the analysis of the data presented in Table 1, the dynamics of the export-import balance for the group of food products and agricultural raw materials is generally positive, although often not stable. Thus, in our opinion, the impact of sanctions and the introduction of counter-sanctions measures in this case can be assessed as positive.

**Table 1.** Export-import balance for the group of food products and agricultural raw materials, million USD.

<b>Territory</b>	<b>2013</b>	<b>2014</b>	<b>2019</b>
Central Federal District	-18400.8	-15509.8	-10501.1
Leading region	-12841	-10308.3	-8056.7
Region outsider	-6.1	-1.2	-26
Volga Federal District	-141.2	81.2	704.3
Leading region	42.8	220.9	266.8
Region outsider	2.6	0.3	-13.8

### 3.2 The impact of sanctions on the development of the agro-industrial complex of the regions: the production aspect

The results of production activities in the agro-industrial complex of the regions are shown in the table 2.

**Table 2.** Agricultural production at actual prices, mln. Rubles

<b>Territory</b>	<b>2013</b>	<b>2014</b>	<b>2019</b>
Central Federal District	916014	1096654	1582777
Leading region	155402	188217	265693
Region outsider	8123	9434	7311
Volga Federal District	881259	1011323	1316907
Leading region	160157	185974	248782
Region outsider	28140	29369	42903

Analyzing the degree of differentiation of regions, we obtain the following values: in 2013, in the Central Federal District, the region-outsider in terms of agricultural production differed from the leading region by 19 times; in 2014 – 20 times; in 2019 – 36 times. B Volga Federal District, similar indicators differed: in 2013 – 5.7 times; in 2014 – 6.3 times; in 2019 – 5.8 times. In general, the volume of production in the Central Federal District increased in 2019 compared to 2013 by 1.73 times, in the leading region – by 1.71 times,

and in the outsider region it decreased, the growth rate was 0.9. The volume of production in the Volga Federal District increased in 2019 compared to 2013 by 1.49 times, in the leading region – by 1.55 times, and in the outsider region – by 1.52 times.

It is interesting to note at the same time a sharp increase in the profitability of production in 2014 compared to 2013. Thus, in the Central Federal District as a whole, profitability in 2014 amounted to 20.5 % against 12.3 % in 2013 in crop production and 28.3 % against 4.8 in animal husbandry. In the Volga Federal District, the situation is generally similar – crop profitability in 2014 rose to 11.1 % from 5.9 % in 2013, and in animal husbandry – amounted to 12.2 % in 2014 against 1.4 in 2013. If we talk about the dynamics of production profitability, then this indicator reached its peak value in 2015, reaching a record 40 % in crop production and 20.5 % in animal husbandry in the Central Federal District. Then the value of the indicator dropped rather sharply, and then its gradual growth was observed again. In our opinion, such an effect of “explosive” growth in profitability can be unambiguously explained by the introduction of Russian counter-sanctions. At the same time, if we analyze the dynamics of profitability by region, we can see a very high degree of differentiation. In particular, in the Central Federal District, the spread of values in 2014 in crop production was from 43.4 % in the leading region to minus 17.5 % in the outsider region. Interestingly, at the same time, in the leading region, profitability increased by exactly 10 times compared to the level of 2013, and in the outsider region, the growth was very insignificant and amounted to only two % age points. A similar situation was observed in animal husbandry. – in the region leading in 2014, the profitability was 54.1 % against 15 % in 2013, and in the region-outsider – increased from minus 16.7 to minus 7.5 %. In the Volga Federal District, profitability in crop production in the leading region increased in 2014 compared to 2013 from 27.4 to 40.6 %, and in the outsider region from minus 5.4 % to minus 2.1 %. In livestock production, the growth in the leading region was observed from 19.9 to 24.9 %, and in the outsider region – from minus 3.3 to minus 1 %.

If we talk about how the share of agriculture has changed in the sectoral structure of gross value added (gross regional product), it can be noted that in the Central Federal District it was: 2.8 % in 2013 (17.7 % for the region-leader and 0 % for the outsider region); in 2014 3.3 % (21.0 % for the leading region and 0.1 % for the outsider region); in 2018, 3.1 % (24.7 % for the leading region and 0.1 % for the outsider region). In the Volga Federal District, similar values were as follows: in 2013, 6.1 % (14.7 % for the leading region and 2.6 % for the outsider region); in 2014, 7.1 % (18.1 % for the leading region and 2.6 % for the outsider region); in 2018, 5.9 % (15.9 % for the leading region and 2.2 % for the outsider region). Thus, the results obtained also indicate a short-term increase in the share of agricultural products in the sectoral structure of gross value added (gross regional product) in 2014, which is undoubtedly also a consequence of counter-sanctions imposed by the Russian government.

### **2.3 The impact of sanctions on the development of the agro-industrial complex of the regions: the consumer aspect**

The consumer aspect of the impact of sanctions is, in our opinion, the most painful and controversial. In particular, if we consider the values of the consumer price indices for food products presented in Table 3, it can be noted that in 2014, in all territories without exception, there was a sharp and very significant increase in prices in relation to the level of 2013. It should also be noted that this trend continued in 2015, and in subsequent years the rate of price growth was much lower. By the way, a similar trend with very similar rates of price growth can be traced in 2009-2010, which, of course, was a consequence of the 2008 crisis.

**Table 3.** Consumer price indices for food products, as a percentage of the previous year.

Territory	2013	2014	2019
Central Federal District	107,6	115,3	102,6
Leading region	105,9	114,3	100,3
Region outsider	110,0	119,3	103,7
Volga Federal District	106,9	115,7	102,1
Leading region	105,2	112,2	100,5
Region outsider	109,5	118,7	103,7

At the same time, a lot of questions are related to the fact that if we consider the data on prices in Russia as a whole for 2019, it turns out that prices for many types of food products that are in constant demand among the population grew at a higher rate than the indicated value of the consumer price index. Regional differentiation of the price level for the most significant food products is also significant.

In addition, if we consider decile coefficients (consumer price indices for 10 % population groups with different levels of disposable resources), it can be noted that for the first group (with the smallest value of the indicator of disposable resources), the price index is always slightly higher than for the tenth group. (with the highest value of the indicator of available resources), which also cannot be assessed positively.

## 4 Discussion

The results of the study demonstrate the complexity and ambiguity of the perception of the problem of the development of the regional agro-industrial complex in the context of economic sanctions. On the one hand, the facts indicate that since the introduction of economic sanctions in 2014 and, accordingly, the introduction of counter-sanctions, the country's agro-industrial complex has shown a steady upward trend, both in terms of agricultural production and in terms of growth in the value of export-import balance in most regions, which clearly indicates the success of the policy of import substitution.

On the other hand, it is obvious that in its impact on the agro-industrial complex of the country in general and regions in particular, the imposition of sanctions in 2014 was in many respects similar to the consequences of the economic crisis of 2008.

In addition, the problem of significant differentiation of the parameters of the development of the regional agro-industrial complex remains urgent, which is partly a consequence of the more general problem of differentiation of the socio-economic development of territories as such. Moreover, in this case we are talking about territories that are relatively close in terms of economic conditions.

## 5 Conclusions

Considering promising areas for further research in this subject area, I would like to note the insufficient study in the scientific literature of issues related specifically to the consumer aspect of the impact of sanctions on the development of the regional agro-industrial complex. In our opinion, promising in this context is the construction of econometric models of dependence, reflecting the impact of factors associated with the introduction of sanctions on the quality, level and price parameters of consumption. The formation of such a model can serve as a basis for building better forecasts of the impact of sanctions on the level of socio-economic development in general and the standard of living of the population of the regions in particular.

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