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Risk Factor Analysis and Sustainability Assessment of AIC Development under Sanctions

E. Chatkina, N.A. Kazakova

Plekhanov Russian University of Economics, Moscow, Russia

ABSTRACT

The sustainable development of the agro-industrial complex is a priority task and a factor in ensuring food security in Russia. The relevance of the study is due to the lack of transparency and limited existing ratings of agribusiness companies, the lack of consideration of the impact of sanctions, their consequences and the ability of companies to promptly reconfigure their business models. In this regard, the purpose of the study was to form a methodology for assessing the sustainability of the development of agribusiness companies in modern conditions. The presented methodology is based on the principles of prioritizing the impact of sustainable development criteria on competitive opportunities; availability of accessible information, its regularity and understandability for users; using the risk factor approach as a navigator for assessing competitive positions. The research methodology is based on an industry approach, followed by an assessment of the impact of identified risk factors on trends in production indicators, market share dynamics, efficiency of operating, financial and investment activities, and business development rates. To visualize the results, the method of constructing competitiveness polygons was used, which provides a clear assessment of the competitive advantages and management abilities of companies to quickly adapt to changing market conditions. The scientific novelty of the study lies in the development of a situational approach to assessing the sustainability of the development of agribusiness companies, based on the impact of identified industry risk factors on business performance. Approbation of the methodology was carried out on the companies, which are participants in the credit ratings for the agro-industrial complex sector of national rating agencies accredited by the Bank of Russia. The theoretical significance of the study lies in the development and adaptation of the methodology of sectoral analysis to the specifics and needs of the agro-industrial complex for the purpose of its sustainable development. The practical results are of value to the Ministry of Agriculture and private investors interested in an independent assessment of companies in order to minimize the risks of investing in sustainable development projects.

Keywords: sustainable development; risk factor approach; AIC; sanctions; credit rating; competitiveness; efficiency; operating, financial, investment activities

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INTRODUCTION

The agro-industrial complex (further — AIC) of Russia covers a wide range of industries related to the production of agricultural raw materials, its storage, processing, production of food and non-food products, as well as agricultural machinery production, safe and efficient use of fertilizers and agrochemicals. Russia's food security was threatened by significant geopolitical risks and, most importantly, sanctions imposed by unfriendly countries. Furthermore, sustainable and balanced development of the sector requires effective measures on the part of the public administration, as well as the companies themselves to quickly adjust business models under the influence of highly turbulent risk factors to enhance competitiveness.

In own papers academic A. G. Aganbegyan pointed to the socio-economic importance of the AIC sector, considering its sustainable development as a factor of economic growth of the country as a whole, while paying attention to its high dependence on investment resources and “system of stimulation of investment” [1]. At the same time, according to the Russian scientists V. V. Ivanter, B. N. Porfiryev, S. D. Bodrunov, D. E. Sorokin, M. A. Eskindarov, V. V. Maslennikov, A. A. Shirova, M. A. Fedotova and others, sustainable economic growth is associated with a number of significant constraints and risks, including the growing uncertainty of the development of the world economy, which increases the importance of risk management and forecasting as instruments of economic policy in the medium- and long-term [2, 3], as well as strategic planning and renewal of economic relations and institutions [4]. One of the important instruments of the country's economic policy in the area of AIC is the Food Security Doctrine, aimed to maintain domestic production at a sufficiently high level, set by threshold values.¹

¹ Doctrine of food security of the Russian Federation. URL: http://www.consultant.ru/document/cons_doc_LAW_343386/ (accessed on 15.03.2023).

The purpose of this study is to assess the ability of AIC companies to adapt to the sanctions, taking into account the impact of various risk factors on the sustainability and competitiveness of companies, to justify the available indicators for comparative analysis in connection with the limited information in modern conditions. To do this, we analyzed trends and summarize the risk factors of AIC development.

According to Rosstat,² production of AIC products in Russia in 2022 compared to 2021 increased in comparable prices by 10.2%. The growth in plant production by 15.9% was mainly due to grain and oil crops, which experts explain by the increase in sowing areas, the use of mineral fertilizers, as well as favorable weather conditions. In these crops, the indicators established by the doctrine of food security of the Russian Federation, significantly exceed the threshold values, in particular, in the grain — by 79%, in the supply of oils — by 110%, which in the future can lead to an imbalance between the cost of imported seed material, fuel, components for agricultural machinery, as well as expenses on the export of Russian wheat, which will increase the risks of liquidity and insolvency of companies.

In the vegetable, fruit and berry sectors there is a high dependence on foreign supplies: for 9 months 2022 the import of potatoes exceeded 2021 indicators by 39.76%, including products of its processing; fresh garlic — by 17.29%; cabbage — by 59.17%; onions — by 41.11%. The main suppliers are China and Uzbekistan. The increase in the gross harvest of berries and fruits is estimated at 2.7%,³ but the internal market cannot

Federal State Statistics Service: Volume of production and indices of production of agricultural products by categories of the Russian Federation. URL: https://rosstat.gov.ru/enterprise_economy (accessed on 15.03.2023).

³ Results of the year from research company NTEch. Business edition for investors in AIC and managers of AgroInvestor. URL: <https://www.agroinvestor.ru/column/dmitriy-trifonov/39508-itogi-goda-ot-issledovatel'skoy-kompanii-ntech/> (accessed on 15.03.2023).

provide itself, with the standard of food safety for berries and fruits at 60% at the actual value of 44%.

During the same year, commodity milk production increased by 3.5%, but cattle production decreased, reflecting the impact of prices and stock sales. Milk stability is 84.3% at 90%, export deliveries amounted to 644 thousand tons. The meat sector recorded a 3.7% increase in live meat production in all categories of farms, including 6.2% in pig farming and 4.7% in poultry farming.⁴ The meat products content exceeds 100% and the food safety indicator is 85%. Nonetheless, duty-free import of beef into Russia continues to ensure price stability in the domestic market. For 9 months of 2022, the increase in meat exports was 17%. Some experts believe that further expansion of exports could create a deficit of meat in the domestic market, which combined with the increase in cost will lead to higher prices. In this case, low grain prices will potentially lower the cost of feed, which will enable even more effective market price management. Despite the fact that overall AIC showed good production results in 2022 and even showed growth, the industry faced serious challenges due to the deteriorating geopolitical environment. Food is not directly subject to sanctions, but the industry is suffering the consequences of their indirect influence and direct restrictions on exports of a number of products, for example, there are limitations on the supply of seafood and fish to the EU and the US.

AIC, like many other industries, has had transaction restrictions, resulting in issues with counterparty settlements, raw material procurement, pharmaceuticals, textiles, and so on. In addition to international settlements, there are risks associated with the supply of means of production. Risk in livestock farming is associated with imports of

breeding products (especially in poultry meat), wheat preparations, vaccines, vitamins, feed additives. In plant breeding – with the import of machinery and equipment for storing crops, seeds and plant protection products. The doctrine of food security establishes the need to maintain the share of domestic seeds at least 75%, but at the beginning of 2023 it was 60.3%. Most independent of imports is the cereal segment (Russian selection share more than 70%). The situation is aggravated by the decision of the Ministry of Agriculture to introduce quotas on imported seed supplies, which, in the opinion of farmers, will reduce competition in the domestic market and create a deficit of seeds, and can also negatively affect the yield, including as a result of the lack of plant protection products, which are also not produced in Russia. Cattle breeding and livestock farming could also be affected a shortage of equipment, components, and the inability to maintain them; import substitution of agricultural technologies and machinery is prolonged process. A significant increase in demand, a shortage of replacement components, and the maintenance of imported machinery causes price increases in the domestic market.

Russia is also importing seed of livestock and small cattle, and while import replacement is delayed, experts predict a decline in the quality of cattle. The problem may be aggravated by the shortage of veterinary products on which Russian livestock farmers depend and which are produced in unfriendly countries.

Since February 2022, packaging companies because of sanctions reduced its production in Russia and raised prices, the Russian production of packaging is currently established. A number of agricultural goods are listed on the stock exchange, for example, beans, their contracts are subject to fluctuations in exchange rates, determining the high significance of foreign exchange risks.

One of the main problems of the AIC is the shortage of personnel due to the lack

⁴ Federal State Statistics Service: Volume of production and indices of production of agricultural products by categories of the Russian Federation. URL: https://rosstat.gov.ru/enterprise_economy (accessed on 15.03.2023).

Table

Risk Factors and Potential Opportunities to Reduce their Impact on the Agro-Industrial Complex of the Russian Federation in 2022–2023

Risk group	Risk factors	Potential Opportunities to reduce risk factors' impact
Market risks	Wheat price reduction Large quantities of wheat surplus Disruption and cost of logistics Inability of the domestic market to provide food for selected product segments	Conclusion of long-term contracts. Use of financial instruments: futures, options Diversification of markets Public procurement. Simplified access to trading. Revision of export quotas, reduction of export duties and promotion of wheat processing Development of own logistics companies. Optimization of location of production. State support programmes, subsidies for the transport of agricultural and food products Contracting with counterparties from friendly countries. Stimulation of domestic producers, including regional producers Development of greenhouse farms to create optimal climatic conditions. Federal project "Development of vegetable growing and potato growing"
Liquidity risks	Non-return of the invested funds	Risk insurance. Optimization of the cost structure, subsidization of seed acquisition costs Development of the program of preferential leasing of agricultural equipment
Credit risks	Counterparty risk	Diversification of sales markets Risk insurance
Political risks	Growth in export taxes Cargo insurance problem Transaction restrictions, export of products	Revision of export duties, maintenance of benefits. Use of ships of Russian and friendly countries. Making payments through reliable banks
Operational risks	Reduced quality of breeding cattle Reduced availability of seeds, plant protection supplies, equipment and components Package cost increase Labor shortage	Cooperation with research institutes, development of R&D. Stimulation of scientific developments in the field of seed production and breeding. Search for new contractors from friendly countries Preferential import of technological equipment, raw materials and materials for priority investment projects. Development of import substitution exchange. Search for cheaper packaging materials. Incentives and subsidies for packaging production Increasing the attractiveness of the industry by creating competitive conditions: mechanization and automation of processes, growth of wages, benefits, subsidies. Development of cooperation of AIC companies with specialized universities, increase of the target set, internship programs and production practices

Source: Compiled by the authors.

of attractiveness of the industry to young people, the deficit of machinery and truck drivers in individual farms and farms as a result of partial mobilization 2022.⁵ The *Table* summarizes risk factors and potential possibilities for reducing their impact on AIC of the Russian Federation in 2022–2023.

METHODOLOGY OF RESEARCH

To justify the methodical approach to assessing the resilience of AIC companies in conditions of high geopolitical risks, we used the paradigm of industry analysis, which is consistent with the research of G. B. Kleiner, who claims that it is impossible to anticipate crises and prevent their consequences, limiting only to macro-analysis [5]. Meanwhile, the majority of the papers in this field by scientists A. A. Frenkel, B. I. Tikhomirov, A. A. Surkov, R. A. Migunov, A. A. Syutkina [6–8] is devoted to macroeconomic trends.

Research by M. A. Fedotova and T. V. Tazihina [9] demonstrates the impact on the sustainable development of companies of social, environmental and management factors through investment, valuation and financing tools. Foreign scientists T. Whelan and E. Douglas [10] analyze the problems of sustainable development in terms of the investment attractiveness of companies. M. Reeves, S. Levin, and D. Ueda [11] provide significant arguments in support of the fact that the company's investment activities stimulate technological and product innovations; operational efficiency contributes to the introduction of resource-saving technologies, the increase of product marginality, the reduction of risk-factors of production safety; and the development of relationships with the business environment ensures the company's more stability and effective growth. In the papers of M. E. Dobbs [12], B. V. Kuznetsov and V. V. Golikova [13] the impact of intra-sector competition on

the sustainable development of companies is demonstrated. A. O. Ovcharov, A. M. Terekhov [14], S. A. Shelamova and others [15], who studied the influence of various factors on the ability of the company in the context of crises, are dedicated to the analysis of the effectiveness of AIC. National rating agencies also offer their AIC sustainability assessment, but in the absence of standardized industry methodologies for sustainability analysis, ratings sometimes yield conflicting results, which generally reduces user confidence in such data.

Thus, the relevance of our study is justified by the insufficient transparency and limitation of the existing ratings of AIC companies, first of all, inadequate consideration of risk-factors of the industry, lack of understandable means of visualization of results, taking into account the impact of sanctions, their consequences and the ability of companies to operatively reconfiguration their business models under the influence of externalities to increase competitiveness.

The alternative approach to assessing the sustainability of AIC companies is based on critical analysis and symbiosis of methodologies and development of industry analysis. In contrast to the approaches of other researchers, our methodology uses a risk-factor approach that explains the key risks affecting the competitive positions of companies and determining their risk resilience [16]. Return on sales shows how price volatility affects operating efficiency: when it decreases, the company's exposure to market risks increases. Investment activity provides opportunities to manage industrial and technological risks and create competitive advantages, with its reduction the level of risks increases. Financial activity indicators influence the level of liquidity risk, which increases as the debt burden increases. The proposed comparative analysis methodology is based on the principles of priority of the impact of sustainable development criteria on

⁵ Official website of the Ministry of Agriculture of the Russian Federation. URL: <https://mcx.gov.ru/docs/> (accessed on 15.03.2023).

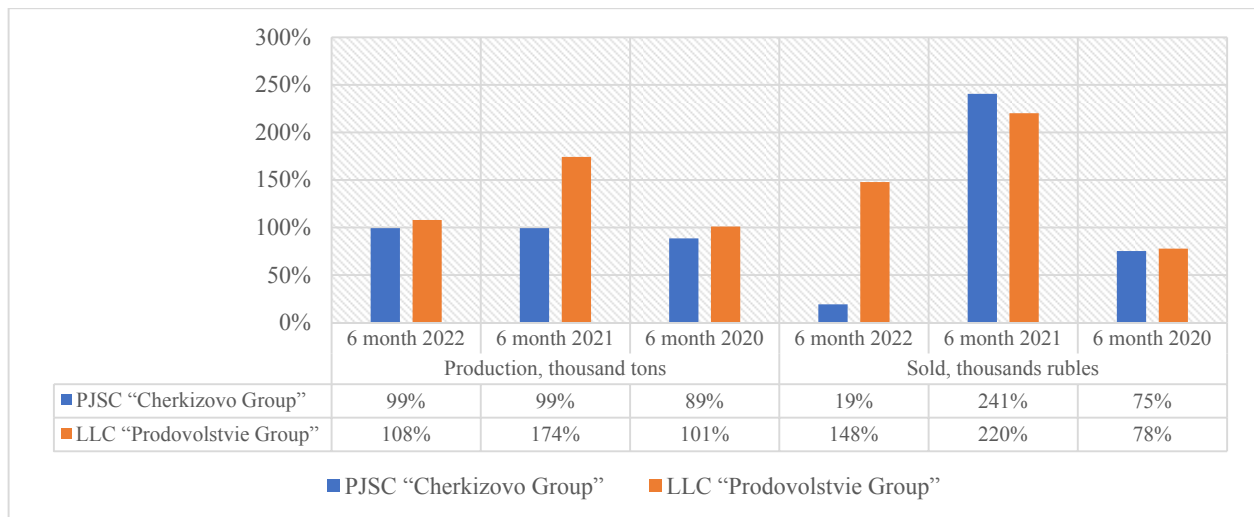


Fig. 1. Dynamics of Changes in Production and Sales Indicators by Companies

Source: Author's calculations.

competitive opportunities; availability of information, its regularity and understanding to users; use of risk-factor approach as a navigator for assessing competitive positions. The proposed situation-based approach to assessing the sustainability of AIC companies is based on the analysis of industry trends, current and forecasting risk factors and means of their visualization.

RESULTS OF THE STUDY

For the selection of companies used data of the December credit ratings of the sector "AIC" of the largest national rating agencies with accreditation of the Bank of Russia. PJSC "Cherkizovo Group"⁶ и and LLC "Prodovolstvie Group"⁷ — are major players in the AIC market, participate in the ACRA, NRA and Expert RA ratings, have published operational and financial reports for the first half of 2022. The analysis was conducted on according to a methodology that includes the following areas of evaluation: trends in production indicators, operational effectiveness, investment efficiency, assessment of financial

sustainability, and business development efficiency.

The first direction of the comparative analysis was **the assessment of trends of production indicators**. Production reports and consolidated reports of companies were used as sources of information. Data on the dynamics of changes in production volumes are summarized on the basis of reports of production results of companies for 6 months 2022. The rate of growth is calculated on the basis of natural and value indicators (thousands of tons and thousands of rubles). Dynamics of deviations of indicators of production and sales represented on the Fig. 1.

Analysing the pace of growth of production of both enterprises, it can be concluded that the first half of 2021 was the most successful in the period considered both for PJSC "Cherkizovo Group" and for LLC "Prodovolstvie Group". Production and sales growth rates in the first half of 2022 decreased significantly for both companies compared to the first half of 2021. However, LLC "Prodovolstvie Group" in the first half of 2022 managed to increase the volume of production and sales compared to the same period in 2021, while PJSC "Cherkizovo Group" showed a decrease in both indicators. In this way, LLC "Prodovolstvie Group" is in a more advantageous competitive

⁶ Cherkizovo Group. URL: <https://cherkizovo.com/press/company-news/archive/?year=2022#/press/company-news/20347> (accessed on 15.03.2023).

⁷ Prodovolstvie Group. URL: <https://prodgrup.ru/> (accessed on 15.03.2023).

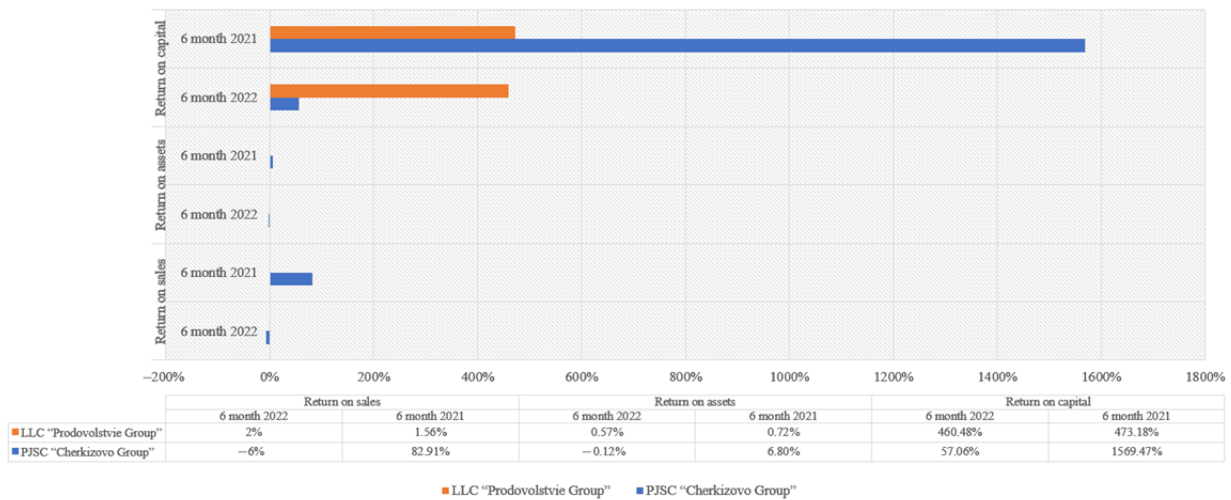


Fig. 2. Return on Sales Based on Net Profit, Return on Assets and Return on Capital

Source: Author's calculations.

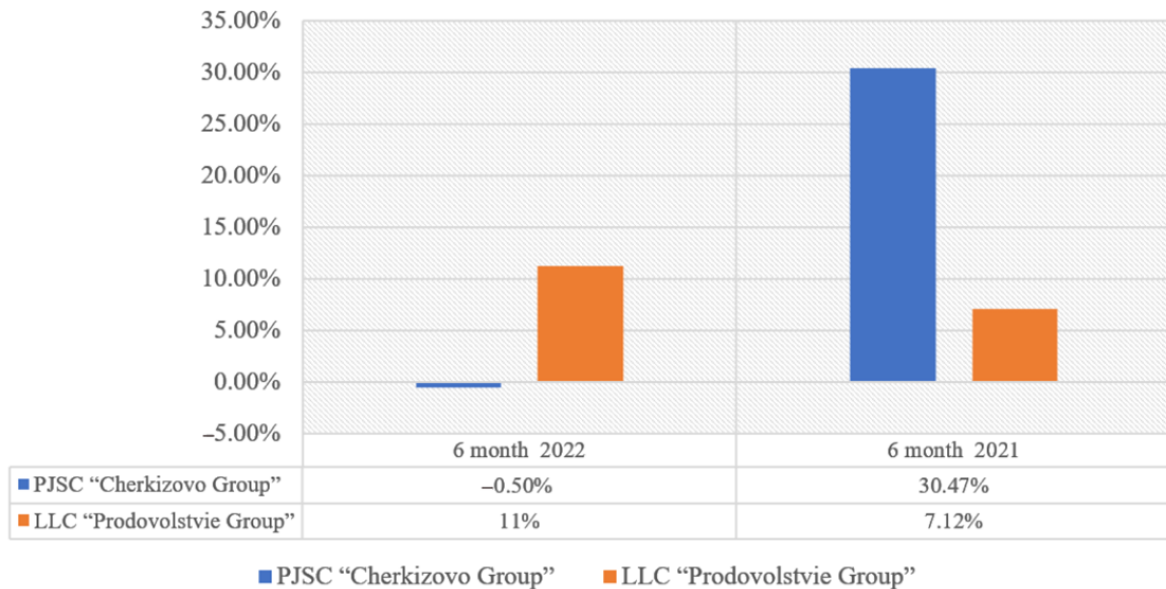


Fig. 3. Dynamics of the Return on "Investment Ratio"

Source: Author's calculations.

position in this direction, than the PJSC "Cherkizovo Group".

The next direction of the comparative analysis is the **assessment of the efficiency of the operational activities of companies**. Return of sales, assets, equity and on capital indicators were used for the financial analysis (Fig. 2).

The first half of 2022 PJSC "Cherkizovo Group" ended with a loss of 222.3 million

rubles, in connection with which the profitability of sales and assets for this period are negative. In a similar period in 2021, the enterprise showed high profitability values for both types, which are higher than the industry average. This trend, combined with the reduction in production and sales, suggests that the company has faced difficulties in the production and marketing process. It also found an extensive decrease in return

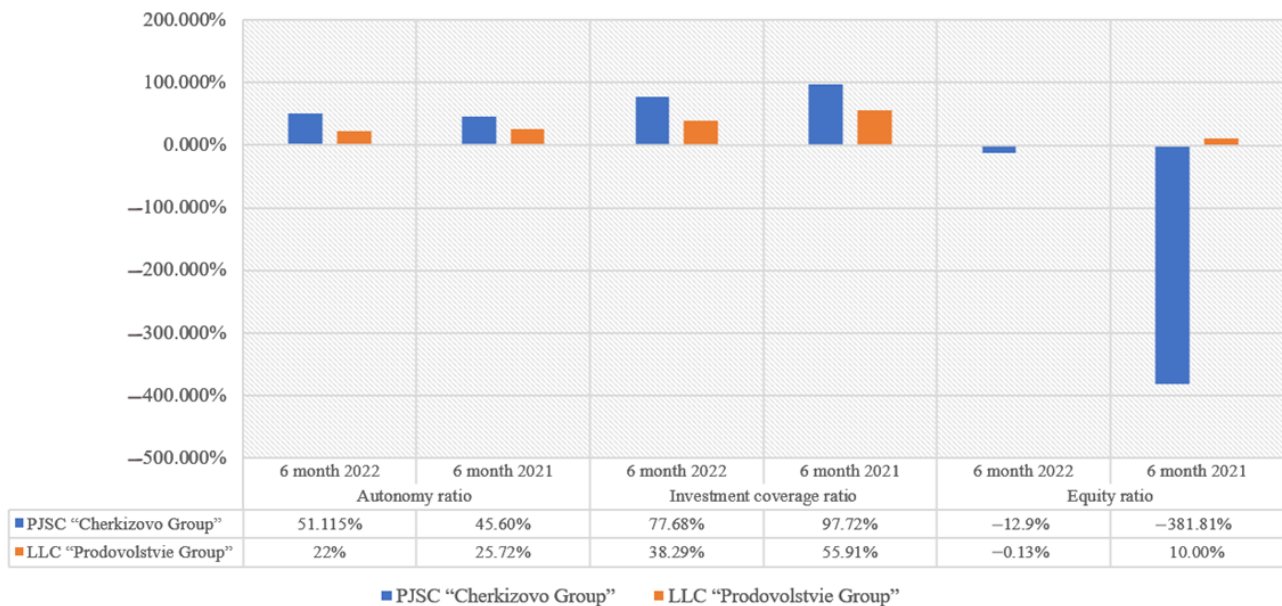


Fig. 4. Dynamics of Coefficients of Autonomy, Provision of Own Working Capital and Coverage of Investments

Source: Author's calculations.

on capital, which was caused by asset value increasing while revenue decreasing.

LLC "Prodovolstvie Group" did not demonstrate a significant deviation of indicators in the first half of 2022 compared to the same period of 2021. However, the figures are substantially below the industry average except for the return on capital, which is 6.1% above the sector average. Nevertheless, in the current dynamics of LLC "Prodovolstvie Group" is in a more competitive position in this direction than PJSC "Cherkizovo Group".

When assessing the direction of the **effectiveness of companies' investment activities**, let us consider their significance: investment activity characterizes the business's ability to manage production and technological risks, activity safety, and the creation of competitive advantages. For evaluation, we will use the indicator "return of investments" (Fig. 3).

In connection with the loss received for the six months of 2022 PJSC "Cherkizovo Group" demonstrates a negative value of the return on investment, while LLC "Prodovolstvie Group" managed to improve this indicator compared to the same period in 2021 by increasing the

net profit for the period under review and increase in equity. Thus, in this direction LLC "Prodovolstvie Group" is in a more favourable competitive position.

The next direction of the comparative analysis is the assessment of financial sustainability. Three indicators were used for comparative analysis: autonomy ratio, equity ratio and investment coverage ratio (Fig. 4).

The final part of the comparative analysis is the **assessment of business efficiency** and development, based on the dynamics of the return on equity indicator, which characterizes the efficiency of companies in turnover of capital into profit (Fig. 5). LLC "Prodovolstvie Group" again demonstrates stability in the period under review, but the value of the return on equity is significantly below the industry average (14%). In the first half of 2021 PJSC "Cherkizovo Group" demonstrated the best performance of return on equity for the period under review, which is due to the growth of net profit and equity. However, in the first half of 2022, the enterprise did not receive a profit, which did not allow to a positive value of return on equity. Thus, in this

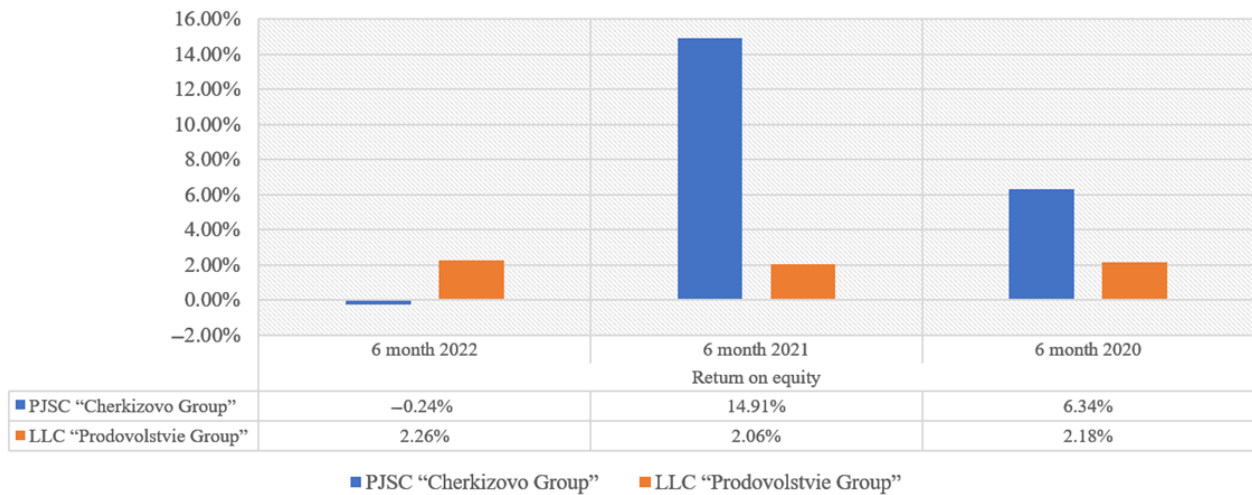


Fig. 5. Dynamics of the Return on Equity Ratio Calculated

Source: Author's calculations.

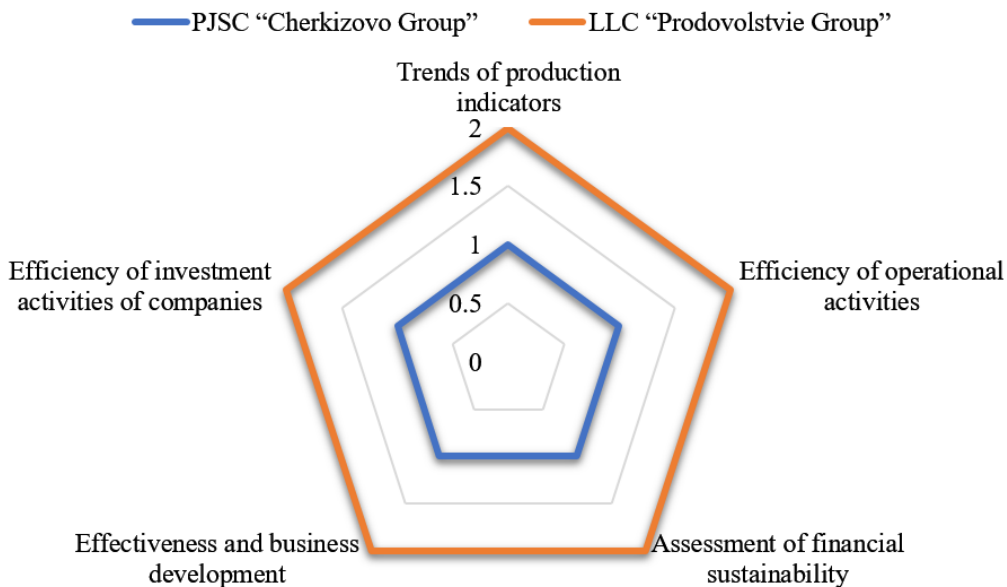


Fig. 6. Company Competitiveness Polygons

Source: Author's calculations.

direction LLC "Prodovolstvie Group" is also in a more favorable position.

To visualize the results of the comparative analysis, the method of competitiveness polygons (Fig. 6), was used, which allows to visually evaluate the competitive advantages and the ability of companies to quickly adapt to changing economic and geopolitical conditions. According to the results of the comparative analysis, LLC "Prodovolstvie

Group" has a more advantageous competitive position than PJSC "Cherkizovo Group" in the first half of 2022. Both companies export products and therefore have comparable geopolitical risks. At the same time, LLC "Prodovolstvie Group" managed to pass the first months of confrontation with geopolitical risks more successfully due to several factors. First, the company's main export flows were originally directed to the East, in particular to

China, which did not lead to break-ups with key counterparties and reduced the impact of the transaction risk factor.

PJSC “Cherkizovo Group” also exports its products mainly to friendly countries (China, Vietnam, Kazakhstan, Saudi Arabia), and from 2022 — to Qatar, Angola and some others. However, the lower share of China in the structure of importers has made the company more vulnerable to difficulties with transactions, logistics, and settlements in national currencies, but at the moment the company is actively adjusting its business strategy; in particular, according to Interfax, by the results of 2022, PJSC “Cherkizovo Group” increased the share of contracts in yuan when settling for deliveries to China to 50%.

Secondly, LLC “Prodovolstvie Group” unlike PJSC “Cherkizovo Group” has its own logistics company, which has own rolling stock and delivers products by all modes of transport: railway wagons, containers, road and sea transport through the ports of the Russian Federation. This significantly reduces the company’s costs, reducing the impact of the logistical risk factor by choosing the optimal route, restructuring the supply chain and the mode of transport.

CONCLUSION

The results of the study allowed to assess the state of AIC on the basis of data of Rosstat, expert assessments and forecasts, identified risk-factors of sustainability of the development of companies in conditions of instability and uncertainty of the macroeconomic situation, and also demonstrated their impact on production and financial indicators.

The scientific novelty and practical value of the study is the formation of a situation approach to assessing the sustainability of the development of AIC companies in contemporary conditions, based on the analysis of trends of production indicators and dynamics of market share, evaluation of the efficiency of operational, financial and investment activities, the pace of business development, as well as supplemented by the construction of polygons of competitiveness, allowing to visualize the results of comparative analysis. The methodology ensures the assessment of competitive advantages, the ability of companies to respond quickly to changing parameters of the internal and external environment and adjust their business models, which can be used in the operational management of companies for the use of best practices, as well as when making management decisions to minimize investment risks.

The theoretical significance of the study is to develop and adapt the methodology of industry analysis to the specifics and needs of AIC for its sustainable development. Practical results represent value for the Ministry of Agriculture, professional associations and private investors interested in independent evaluation of companies in order to minimize the risks of investing in sustainable development projects.

Our future research will focus on increasing the perimeter of the companies questioned, grouping and more in-depth analysis of their business models, as well as the construction of forecasting models, allowing to justify the most effective enterprises for public procurement and investment.

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ABOUT THE AUTHORS



Ekaterina Chatkina — master student of the basic department of financial and economic security, Plekhanov Russian University of Economics, Moscow, Russia
<https://orcid.org/0000-0001-6054-2707>
echatkina@mail.ru



Natalia A. Kazakova — Dr. Sci. (Econ.), Prof., Prof. of the Basic Department of Financial and Economic Security, Plekhanov Russian University of Economics, Moscow, Russia
<https://orcid.org/0000-0003-1499-3448>
Corresponding author:
axd_audit@mail.ru

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