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Scenarios of Business Development in the Agricultural Machinery Market Under Conditions of International Trade Integration

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ABSTRACT

The purpose of the article is to identify and analyze scenarios of business development in the agricultural machinery market under conditions of international trade integration using the case of present-day Russia and to determine the need for state support for domestic production. As a methodological provision, we use the scenario analysis method adapted by the authors for the determination and analysis of possible scenarios of business development in the agricultural machinery market under conditions of international trade integration. From the research results, the authors conclude that the Russian agricultural machinery market develops dynamically under the influence of multiple favorable factors and positive tendencies, which include a population's income growth, increases in crop areas of farm crops, and state agricultural machinery modernization programs, among other. In view of recent events in the currency market, Russian manufacturers of agricultural machinery are presented with better opportunities to export their products. The performed analysis of features of the Russian agricultural machinery market under conditions of international trade integration shows that increased demand and market prices are probable and that this could lead to enterprise income growth. From our scenario analysis of business development in the agricultural machinery market under conditions of international trade integration, we identify the absence of an urgent need for state interference in market processes in the Russian market for agricultural machinery in the next five years.

KEY WORDS:

business development, agricultural machinery market, international trade integration, scenario analysis

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Introduction

Through international trade integration, markets grow and entrepreneurs travel beyond national limits. Under such conditions, the level and nature of competi-

tion in national markets changes, resulting in intensive fluctuations in market prices and changing demand volumes and preferences.

The agricultural machinery market is no exception – as integration processes in the global economy change, foreign suppliers appear in agricultural machinery markets, increasing competition and promoting the division of influence spheres and market structure changes.

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As a result, consumers can choose from a large variety of products and manufacturers of agricultural machinery can start to compete with one another for sales even more, leading to a reduction in general market prices and in buyer power growth.

Countries focused not only on meeting national demand but also on the preservation of national production face serious problems related to the reduction of competitiveness between domestic manufacturers, which cannot compete with global companies that have accumulated substantial financial and human resources and that employ superior technologies and equipment.

An inevitable result of a country's integration into the global economy pertains to the dilemma between consumer and manufacturer interests. Countries that prioritize consumers' interests risk becoming less productive and face problems related to economic security.

Countries that prioritize manufacturers' interests must interfere with market processes and expend public welfare in supporting domestic manufacturers. There is a risk of creating conditions that are too favorable for domestic manufacturers under which there are no incentives for development, spurring manufacturers' incapacities to adapt to new economic conditions and to compete in global markets.

This is why in developing state policies that support domestic manufacturers, it is necessary to develop a clear understanding of perspectives on business development in the agricultural machinery market under conditions of international trade integration without violating market mechanisms through state regulation.

This allows one to first identify the need for such interference and to second identify the most central avenues of regulation needed to achieve maximum effects with minimal expenditures. Consequently, the examination of perspectives of business development in the agricultural machinery market under conditions of international trade integration is feasible.

The purpose of the article is to identify and analyze scenarios of business development in the agricultural machinery market under conditions of international trade integration using the example of present-day Russia and to outline the need for state support for domestic production.

Literature review

Economic mechanisms, preconditions, and methodological aspects of business development in the agricultural machinery market under modern economic conditions have been studied in multiple works, including (Bortolini, Cascini, Gamberi, Mora, & Regattieri, 2014a; Huang, Yun, You, & Wu, 2011; Liu Hu, Jetté-Nantel, & Tian, 2014; Staus & Becker, 2012; Yakymenko, 2013; Yu, Leng, & Zhang, 2012; Zhovnovach, 2014). In the agricultural machinery market, machinery and agricultural equipment is bought and sold (Muzlera, 2014). The following main segments of the agricultural machinery market can be identified: agricultural goods, combine harvesters, cultivators, walking tractors, plows, drill machines, and mowing machines, among others. (Bortolini, Mora, Cascini, & Gamberi, 2014b). The agricultural machinery market is central for national food security, as it creates infrastructure needed for agriculture development (Morozova, Litvinova, Rodina, & Prosvirkin, 2015).

Integration processes in the current global economy based on various forecasts and possible future change scenarios have been presented in the following works: (Anderson & Valenzuela, 2011; Dasgupta, Pitigala, & Gourdon, 2012; Golub & Hertel, 2008; Palamarchyk, 2013; (Qobo, 2012, Sung, Delgado, Peña, & Paladino, 2013). Integration involves closing of national economic systems (Bryant & Javalgi, 2014) while preserving their capabilities for self-regulation and self-development (Kobrin, 2015). Within integration processes of the global economy, international standards and norms of economic activities appear in addition to international organizations that control their observation (Wirtz, Tuzovic, & Ehret).

Peculiarities of business activities under conditions of international trade integration and global competition for enterprises operating in various countries and economic spheres have been examined in (Antonakakis & Tondl, 2014; Ganushchak-Yefimenko, 2013a; Ganushchak-Yefimenko, 2013b; Gong & Kim, 2013). Under conditions of international trading integration, entrepreneurs are presented with opportunities to enter new foreign markets (Bull, 2014). At the same time, foreign rivals appear in national markets (Wirtz et al., 2015). On the whole, strengthening competition is an integral component of integration processes in the global economic system (GonÇalves & Madi, 2013).

Table 1. Tree of scenarios

Situation	Scenario (S)	Probability of scenario (P)
Market price fluctuations	$S_{1\text{ price}}$	$P_{1\text{ price}}$
	$S_{2\text{ price}}$	$P_{2\text{ price}}$

Changes in demand volumes and product sales	$S_{n\text{ price}}$	$P_{n\text{ price}}$
	$S_{1\text{ demand}}$	$P_{1\text{ demand}}$
	$S_{2\text{ demand}}$	$P_{2\text{ demand}}$

	$S_{n\text{ demand}}$	$P_{n\text{ demand}}$

Table 2. Final scenario analysis table

Scenarios of market development	Changes in prices and demand	Probability	Price, RUB (P)	Volume of sales, items (V)	Financial results, RUB million (FR)
Most probable scenario	S_{price}	$P_{\text{price}}(\text{max})$	P_1	V_1	P_1^*
	S_{demand}	$P_{\text{demand}}(\text{max})$			$P_{\text{price}}(\text{max})^*$ V_1^* $P_{\text{demand}}(\text{max})$
...
Least likely scenario	S_{price}	$P_{\text{price}}(\text{min})$	P_5	V_5	P_5^*
	S_{demand}	$P_{\text{demand}}(\text{min})$			$P_{\text{price}}(\text{min})^*$ V_5^* $P_{\text{demand}}(\text{min})$

Problems related to agricultural machinery market functioning under conditions of international trade integration and national agricultural machinery market state regulation for support purposes are outlined in the following works: (Clapp & Helleiner, 2012; Khafizova, Galimardanova, & Salmina, 2014; Mulatu & Wossink, 2014; Vošta, 2014; Yushkevych, 2013). Under conditions of international trade integration, national markets of agricultural machinery face intensifying competitive struggles (Solovchuk, (2015) that foreign enterprises often win, compromising national food security (Gnedenko & Kazmin, 2015). To protect national manufacturers, states regulate the development of agricultural machinery markets by providing tax subsidies and more favorable conditions for the

economic activities of national manufacturers (Morozova & Litvinova, 2014).

Our analysis of existing scientific works in this research area shows that these works examine specific aspects of the specified problem, leaving the necessity to conduct complex research on business development scenarios in agricultural machinery markets under conditions of international trade integration to address existing gaps and to formulate a comprehensive and objective understanding of future business activities in agricultural machinery markets.

Method

As a methodological provision, the scenario analysis approach adapted by the authors is applied to iden-

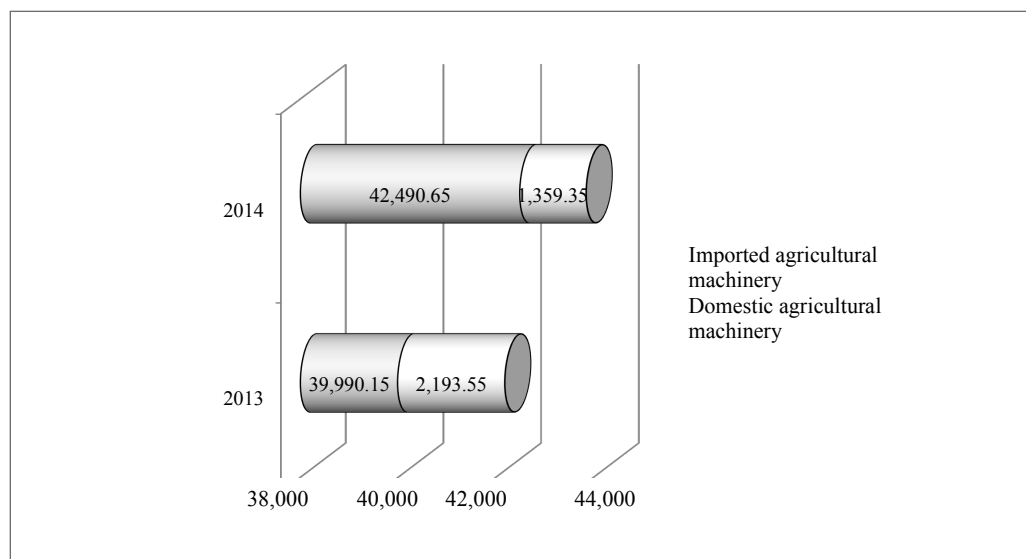


Figure 1. Dynamics and structure of the Russian agricultural machinery market in 2013-2014

Source: Adapted from "Manufacture of agricultural machinery in Russia in January-March 2015" by Agroinfo. Retrieved from <http://agroinfo.com/proizvodstvo-selxoztexniki-v-rossii-v-yanvare-marte-2015-goda-1507201504>

tify and analyze possible development scenarios of business in the agricultural machinery market under conditions of international trade integration. This approach is designed to identify factors that influence the agricultural machinery market.

On the basis of the determined factors, possible market price and sales volume changes and potential scenarios for such conditions are determined. Each scenario is assigned a possible probability value through expert evaluation through an analysis of market tendencies and factors of market development. As a result, a tree of scenarios was created (Table 1).

From probability scenarios of prices and demand changes, scenarios for the market as a whole and for businesses in this market were formed. The most likely scenario involves price and demand development with maximum probability. Then, scenarios of market development involving price reductions and demand change probability were formulated.

For each business development scenario, average market prices and total volumes of sales in the market were determined. From these data, balanced financial results (profits) were calculated as a product of the

price and probability of changes under this scenario and of the volume of sales and probability of such a change under this scenario (Table 2).

The results of the scenario analysis identify future tendencies of business development in the market on the basis of an analysis of factors that influence this market. This methodology allows for the economic modeling and forecasting of market changes through mathematical instruments, ensuring the generation of precise and reliable results.

Results

Before presenting the results of the scenario analysis, let us outline the most important factors of business development in the agricultural machinery market under conditions of international trade integration. The most important of these is foreign competition.

According to data drawn from analytical and consulting company ACM-Holding, in 2014, the agricultural machinery market of Russia reduced by 3.8% relative to 2013. The total volume of agricultural machinery sales for January-December of 2014 amounted to 43,850, with only 1,316 involving Russian machines (market share – 3.1%).

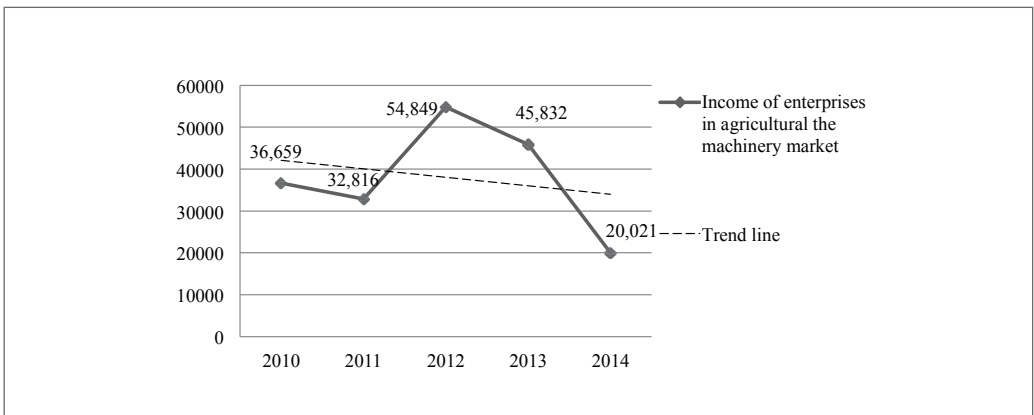


Figure 2. Enterprise profits in the agricultural machinery market from 2010-2014 in RUB million
Adapted from "Russia in numbers. Scientific research and innovations 2015: Bulletin of Rosstat" by Rosstat (2015).
Retrieved from http://www.gks.ru/free_doc/doc_2015/rusfig/rus-15.pdf

In 2014, the agricultural machinery market underwent an increase in the market share of imports of new foreign-branded agricultural machinery, which grew from 26.1% to 39.0%, and import shares of used agricultural machinery grew from 7.1% to 8.2% in natural form; imports of used agricultural machinery grew by 10.7%, to 3,590 items.

Overall, sales of imported agricultural machinery (used and new) grew by 36.6%, increasing from 15,200 to 20,700 items (Agroinfo, 2015). The dynamics and structure of the Russian agricultural machinery market from 2013-2014 are shown graphically in Fig. 1.

Fig. 1 shows that the share of imported products in the Russian agricultural machinery market increased in 2014, posing potential losses in domestic production.

Another important feature of the development of the Russian market for agricultural machinery pertains to the growth in population income. As agricultural products and agricultural machinery are complementary goods, increased consumer demand for agricultural products increases demand for agricultural machinery from agricultural manufacturers.

Due to tendencies toward eco-product popularization, agricultural enterprises re-orient their activities toward such forms of production. To do so, new equipment from agricultural machinery manufacturers must be purchased.

Another factor that has affected the development of the Russian agricultural machinery market is Russia's Doctrine of Food Security to 2020, which calls for an increase in farm crop areas. This has also increased demand for agricultural machinery (Larionova, Suslova, Povorina, & Vinogradova, 2015).

These factors also include Russian state programs for the modernization of agricultural machinery on the basis of national strategies of economic modernization. This has increased demand for agricultural machinery. From such increased demand under market forces, agricultural machinery prices will increase.

Recent trends in financial markets have led to the depreciation of the Russian ruble and have made the export of Russian agricultural machinery more profitable. In turn, Russian agricultural machines present price advantages, and despite their lower quality and weaker branding relative to foreign rivals, they are of interest to foreign customers, allowing Russian agricultural machinery manufacturers to compete successfully in foreign markets (Vinogradova, Kulyamina, Koroleva, & Larionova, 2015).

A focus on exports will likely ensure the preservation of Russian agricultural machinery production even with a loss of positioning in the domestic market. However, when planning state strategies for the support of national production, it is not expedient to rely on the moods of players in financial markets alone,

Table 3. Tree of changes in prices and demand in the Russian agricultural machinery market under conditions of international trade integration

Situation	Scenario	Probability of scenario
Fluctuations in market prices	Increase in prices	by 5% 0.3
		by 10% 0.5
	Prices are unchanged	0.1
	Reduction of prices	by 3% 0.06
		by 5% 0.04
Changes in the volume of demand and in product sales	Increase in demand	by 5% 0.4
		by 10% 0.3
	Demand is unchanged	0.2
	Reduction of demand	by 3% 0.07
		by 5% 0.03

Table 4. Final table for the scenario analysis of business development in the agricultural machinery market under conditions of international trade integration

Scenario	Changes in prices and demand	Probability	Price, RUB	Volume of sales, items	Financial results, RUB million
Most likely scenario	Increase of prices	by 10% 0.5	502,237.17	46,042	4,624.85
	Increase in prices	by 5% 0.4			
Highly probable scenario	Increase in prices	by 5% 0.3	479,408.21	48,235	2,081.18
	Increase in prices	by 10% 0.3			
Scenario with moderate probability	Prices are unchanged	0.1	456,579.25	43,850	400.42
	Demand is unchanged	0.2			
Unlikely scenario	Reduction of prices	by 3% 0.06	442,881.87	42,534	79.12
	Reduction of demand	by 3% 0.07			
Least likely scenario	Reduction of prices	by 5% 0.04	433,750.29	41,657	21.68
	Reduction of demand	by 5% 0.03			

as these moods change and the Central Bank of the Russian Federation imposes active monetary policies aimed at strengthening the national currency (Popkova, Yurev, Stepicheva, & Denisov, 2015).

Our analysis of the development of the Russian agricultural machinery market under conditions of international trade integration shows that increased demand and price levels in this market are to be expected, and so it is possible to anticipate enterprise profit growth. Enterprise profit dynamics in the agricultural machinery market for 2010-2014 are shown in Fig. 2.

Fig. 2 shows that over the last five years, there has been overall decline in enterprise profits in the agricultural machinery market. Despite 67% growth occurring in 2012, this was followed by a rapid decline of 64% in 2014. Profits declined by 45% over five years (RUB 16,638 million).

From our analysis of statistical information on the Russian agricultural machinery market, it is possible to conclude that in 2014, sales volumes in the market involved 43,850 items of machinery that earned RUB 20,021 million for enterprises in this market. Thus, the average annual price for agricultural machinery amounted to RUB 456,580. Comparison results for the tree of price change and demand scenarios for the Russian agricultural machinery market under conditions of international trade integration are shown in Table 3.

Table 3 shows that the most likely scenarios involve price increases of 10% (0.5) and 5% (0.3) as well as increased demand of 5% (0.4) and 10% (0.3). Price and demand declines of 5% are the least probable (0.04 and 0.03, respectively). Scenarios of Russian agricultural machinery market development under conditions of international trade integration for the next 5 years (until 2020) are shown in Table 4.

Table 4 shows that the most likely scenario involves price growth of 10% and growth in demand of 5%. For this condition, the average market price of an agricultural machinery item will be RUB 502,237.17, the volume of sales in the market will amount to 46,042 items, and agricultural machinery manufacturer profits (financial results) will amount to RUB 4,624.85 million. This scenario does not involve state support for manufacturers of agricultural machinery.

A scenario involving a price increase of 5% and increased demand of 10% is highly probable. Then, the average annual price of an agricultural machinery item will be

RUB 479,408.21, the volume of market sales will amount to 48,235 items, and agricultural machinery manufacturer profits (financial results) will amount to RUB 2,081.18 million. This scenario does not involve state regulation of the Russian agricultural machinery market.

A scenario of moderate probability involves fixed price and demand levels in the Russian agricultural machinery market and a financial value of RUB 400.42 million. Conditions involving an insignificant reduction of prices and demand of 3% is unlikely. In this case, the average market price for agricultural machinery will decrease to RUB 442,881.87. Sales volumes will amount to 42,534 items with financial results equal to RUB 79.12 million.

The least probable scenario would involve a significant decline in demand and prices for agricultural machinery of 5%. Under such conditions, the price for an item of agricultural machinery would decline to RUB 433,750.29, sales volumes would amount to 41,657 items, and profits would amount to RUB 21.68 million. If this scenario is realized, full-scale state interference and agricultural machinery market development for stimulating demand and support for national production will be necessary.

Conclusion

Our research results show that the Russian agricultural machinery market develops dynamically under the influence of multiple favorable factors and positive tendencies, including population income growth, the expansion of farm crop areas, and state programs for agricultural machinery modernization, among others. In view of recent trends in the currency market, Russian manufacturers of agricultural machinery have been better able to export their products.

The results of our scenario analysis of business development in the agricultural machinery market under conditions of international trade integration show that there will be no urgent need for state interference in Russian agricultural machinery market processes in the next five years, as according to our forecasts, this market will likely witness increased demand and market prices to 2020, which should result in significant profits.

Under such conditions, spending assets of state budgets to elicit additional support for national production is not effective. However, for the realization of the least probable scenarios, which assume

reduced price levels, sales volumes and profits, state regulation of the Russian agricultural machinery market will be necessary.

The results of the present study are limited by a number of factors affecting our forecasts of Russian agricultural machinery market development under conditions of international trade integration. Despite our thorough analysis of possible influencing factors, such factors are difficult to interpret and require further study; the precise treatment of their effects is also difficult to achieve. Therefore, our results should closely, but not fully, reflect real processes.

Further research in this area may involve monitoring the Russian agricultural machinery market to 2020 to identify realized scenarios, to verify the precision of formulated forecasts, and to identify additional factors shaping this market under conditions of international trade integration for the purposes of formulating new forecasts and increasing their precision.

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