Digitization of the agro-industrial complex of Russia as a factor of increasing the investment attractiveness of innovative start-ups

E G Sheina and M Yu Zavyalova
Ural State University of Economics, 62, 8 Marta street, Yekaterinburg, Russia

E-mail: shekat@mail.ru

Abstract. Modern realities of the Russian economy create new challenges in the development of the agro-industrial complex. The instability of the financial and economic environment leads to a slowdown in the growth rate of the industry. The data of the Russian federal state statistics service on the dynamics of agricultural development show successful attempts of the state authorities to digitize the agro-industrial sector through the development of state programs and creation of an agricultural ecosystem. The comparative characteristic of small business and start-ups is given. Key difficulties in the development and implementation of start-ups in the agricultural sector of the economy are identified.

1. Introduction
At the present stage of the Russian economy development in conditions of uncertainty, increasing competition, rapidly changing consumer preferences in the agricultural sector, there are a number of problems that need to be solved immediately. By 2019, one of the key problems in the field of agricultural development is the increase in prices for imports of agricultural products, the unstable exchange rate, rising interest rates on loans, the lack of the necessary agricultural infrastructure, and weak support from public authorities. Agricultural production has a seasonal nature of activity, therefore, with the onset of the summer season, prices for equipment (fixed capital) and fertilizers (working capital) increase by several times, which pushes investors to invest in this industry, because of the lack of financial the sustainability of agricultural enterprises as a result of investments may result in the loss of investments [1-2].

2. Research methods
At the legislative level, active work is under way aimed at resolving existing problems. The Ministry of Agriculture together with the Ministry of Economic Development and the Ministry of Finance of the Russian Federation developed the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food Markets for 2013-2020, which includes ensuring the development of the agro-industrial complex of Russia through the implementation of the departmental program “Digital agriculture, increasing exports of agricultural products through the introduction of the project "Export and agro-industrial complex", sustainable development of rural areas through the activities of Support and implementation of measures for the integrated arrangement of settlements located in rural areas. Federal Law No. 264-FZ dated December 29, 2006 “On the Development of Agriculture”, Decree of the President of the Russian Federation No. 1662-r dated
November 17, 2008 “Concept of the Long-Term Social and Economic Development of the Russian Federation for the Period up to 2020”, Decree of the President of the Russian Federation №120 dated January 30, 2010 “The Doctrine of Food Security of the Russian Federation” are the main regulatory documents for the development of agricultural enterprises that ensure food, financial and economic security of the country as a whole. Further, the authors analysed the dynamics of key financial and economic indicators of the agricultural sector of the Russian Federation over the past 5 years.

3. Main part
It should be noted that during 2014-2018 the agricultural sector observed a decline in output by 0.6% (figure 1). Crop production for the entire analysed period is reduced and by 2018 it is 2.1%, while the livestock industry, on the contrary, is growing, increasing by an average of 0.3% per year.

![Figure 1. Dynamics of agricultural production in 2014-2018, mln. rub.](image1)

According to the forecast data of the Ministry of Economic Development of the Russian Federation following the results of 2019, the agro-industrial complex of the Russian Federation should demonstrate an increase of 1%.

For 2014-2018 in the agricultural sector, there is an increase in investment in fixed assets of about 7% per year due to the increase in the share of agribusiness enterprises operating mainly at the expense of their own sources of financing (figures 2 and 3). It is important to note that, in general, this share of agricultural investment is only 0.5% of all in the amount of investment in fixed assets of the Russian Federation.

![Figure 2. Dynamics of investments into the fixed capital of the agricultural sector in the Russian Federation for 2014-2018, billion rubles.](image2)

![Figure 3. The structure of investment into fixed assets of the agricultural sector for 2014-2018 by funding sources, %](image3)
In 2019, obtaining financial support from the state causes a number of difficulties. Government agencies are ready to finance only large investment projects, but so far government support for small peasant farms remains inaccessible due to the excessive complexity of the procedure for obtaining it and the bureaucratization of the system [3].

For five years, the leading regions in terms of investments in fixed capital have been raw material regions of Russia: the Central Federal District (FD), the North-West Federal District, and the Ural Federal District (figure 4).

**Figure 4.** Dynamics of investments in fixed capital by federal districts of the Russian Federation for 2014-2018, million rubles.

The volume of investment into the top three regions in terms of attracting investment by 2018 exceeds 1406 billion rubles. High rates of investment attractiveness are ensured through the development of manufacturing industries, mechanical engineering, and the IT technology industry. The industry of agro-industrial production in the investment structure of the Central Federal District accounts for less than 2%, the North-West Federal District (1.2%), and the Urals Federal District (0.8%).

In 2014-2018 the largest share in the agro-industrial complex is occupied by enterprises engaged in the cultivation and processing of sugar beet, grain, and sunflower seeds. One of the strategic objectives of the development of agriculture in the Russian Federation is to stimulate production of growing potatoes, vegetables, and milk production (figure 5). From February 2017 to March 2018, there is a decrease in the interest rate on loans to non-financial organizations by 1.73% due to a fall in the key rate from 10% to 7.25% (Fig. 6). However, a gradual increase in the interest rate on loans from April to December 2018 indicates a rise in the cost of loans, which in turn served to increase the number of unprofitable enterprises in the agricultural sector in 2018 compared to 2017 by 20.4% or 292.6 billion rubles.

**Figure 5.** Structure of production of main types of agricultural products by categories of farms for 2014-2018, %.
In the period from 2015 to 2016, due to the imposition of economic sanctions on the part of Western countries on the import of imported products in the Russian Federation, state programs were actively developed aimed at digitizing agriculture as one of the attractive sectors of the economy, financial support was provided to agricultural enterprises in subsidies. These measures allowed in December 2018 to accelerate the growth rate of exports to 28.7% in annual terms (figure 7). The fall in imports of agricultural products in 2018 reached 2.9% (figure 8).

According to statistics in 2018, about 4.8 million people were employed in the agricultural sector. At the same time, there is only one specialist in the field of information technology for one thousand employees, which indicates a low digitization of the agro-industrial complex in the Russian Federation. In modern realities, key trends in accelerating the pace of agricultural development are population growth, trade globalization, and the development of bio-and nano-technologies [4].

The creation of a digital ecosystem of agriculture of the Russian Federation should represent a platform where emerging entrepreneurs jointly with the support of the state develop innovative projects in the agro-industrial sector in the following areas: modernization of agricultural equipment, production of agricultural production, growing seeds, production of fertilizers and animal feed [5].

The ecosystem of agriculture includes five components:

- investors;
- Insurance companies;

Figure 6. Weighted average rates on loans submitted to non-financial organizations.

Figure 7. Dynamics of agricultural exports for 2014-2018, millions of dollars.

Figure 8. Dynamics of imports of agricultural products for 2014-2018, millions of dollars.
According to the authors, one of the effective ways to improve production results in the sectors of the agro-industrial complex is the transition to digital agriculture through the development and financial support for start-up as a key link in the agricultural ecosystem of the Russian Federation. The place of a start-up in any business system is ambiguous [9]. This is the most initial level, which represents a zero, nascent stage of business, since a start-up is the stage from which any innovative enterprise starts its development, including in the sphere of agriculture passing through all stages of expanding its scale (figure 9). In addition, the start-up has distinctive features (table 1).

![Figure 9. Business growth and development model.](image)

| Characteristic            | Start-up                                                                 | Small business                                                                 |
|---------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Innovation                | Creating new business solutions, innovation                               | Follows on ready-made business solutions                                         |
| The limits of enterprise growth | Unlimited, aims to occupy a larger market share                           | Limited by entrepreneur, often created for a specific circle of clients           |
| Rates of growth           | 1 year                                                                   | 3-5 years                                                                      |
| Priority goal             | Creating a competitive product, then receiving revenue from its sales and profits. | Making a profit from the first day of business                                   |
| Profit                    | In the early stages of loss                                              | Possible from the first day of business                                          |
| Sources of financing      | Own funds, funds of venture funds, business angels, investors, crowdfunding| Own funds, funds of a close circle of persons, bank loans, investor funds        |
| Technology                | Technology, innovation - the main product of a startup                    | Creating new technologies is not required - there are ready-made solutions.     |
| Life cycle                | Origin, R & D, Pilot production, Commercialization, Mass production, Recession | Origin, Formation, Growth, Maturity, Recession                                  |
| Duration of business      | 92% of enterprises close in the first 3 years                             | 32% of enterprises close in the first 3 years                                   |
| Amount of workers         | Changes with the scale of the start-up                                   | Constant required for current defined production scales                         |
| Exit strategy             | Sale of start-up, IPO                                                     | Selling a business, Inheritance                                                 |

4. Conclusion
Russia has an interest in the development of innovations and innovative forms of business, especially in such important sectors as agriculture is for the country. But today, the problem of searching for available sources of start-up financing due to the long period of financial investments, the increased level of financial risk and the uncertainty of the final financial result remains a significant problem.
Despite the fact that start-ups are an innovation for the Russian Federation, the pace of their development is rapidly gaining momentum. It is necessary to build a high-quality and uninterrupted interaction of each of the components of the agricultural ecosystem of the Russian Federation as part of building a business growth model in the agro-industrial complex - from start-up to large-scale enterprises. Currently, there are start-up platforms in the agricultural sector of the economy, but their number is not enough to accelerate the growth rate of the agricultural sector. Attracting talented and creative start-up entrepreneurs to the development of innovative ideas in the field of agriculture, on the one hand, and financial resources from the state, on the other hand, will ensure the successful commercialization of these ideas into actual production, while increasing the competitive advantages of the entire industry, its quality and quantitative indicators, which will also entail an increase in its investment attractiveness.

References
[1] Balashov I A 2018 Digitalization as a basis for changes in the regional economy Regional problems of economic transformation: integration processes and mechanisms of formation and the socio-economic policy of the region Proceedings of the IX International Scientific and Practical Conference pp 305-7
[2] Kharitonov A V 2017 Assessment of the development of agriculture in the region: problems and solutions Strategic directions of development of the agroindustrial complex of the CIS countries Proceedings of the XVI International Scientific and Practical Conference: in three volumes pp 175-8
[3] Ivashentseva T A 2014 On the role and features of investments in startups in the context of the modernization of the Russian economy Economy and society 1-1(10) 621-4
[4] Kichikhanov P M 2016 Startups: state and development Young scientist 3(107) 529-31
[5] Ognivtsev S B 2019 Digitization of economics and economics of digitization of the agro-industrial complex International Agricultural Journal 2(368) 77-80
[6] Cherednikov O 2016 High-tech startups in the world and Russia World economy and international relations 10 68-75
[7] Rytova N S 2018 Digitalization as the determining factor of modernity in the global economy Economy: yesterday, today, tomorrow 8(12A) 547-53
[8] Yamalov I M 2011 Methodical aspects of managing the development of rural households in the region (Chelyabinsk: Chelyabinsk State University)
[9] Draper W 2017 Startups of the Silicon Valley Professional Games (Moscow: Ser. RVK Library)