
GLOBAL EXPERIENCE OF FINANCIAL REGULATIONS OF THE AGRO-INDUSTRIAL COMPLEX AND SERBIAN ENTREPRENEURIAL AGRICULTURE IN MODERN BUSINESS

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ABSTRACT

The paper analyzes international practices in the financial regulation of the agro-industrial complex, with a special focus on the Republic of Serbia and the improvement of sustainable sector development under economic challenges. Particular attention is given to innovative financial instruments, including agrifintech, crowdfunding, and index insurance, as well as to the experiences of the United States, the European Union and China. The research applies a comparative analysis of financial regulatory models, institutional frameworks, and financing mechanisms. The findings highlight the importance of digitization and innovative financial models for improving access to capital and strengthening the competitiveness of small and medium-sized agricultural farms. The study also identifies key barriers, including inadequate infrastructure, low digital literacy, and regulatory limitations. The paper contributes to the literature by integrating traditional and modern financial instruments within the context of transition economies.

Introduction

The financial regulation of the agro-industrial complex (AIC) plays a key role in ensuring the stable and sustainable development of agriculture at the national and global levels. The focus of this topic is conditioned by the need to ensure food safety, stabilize the income of rural producers, and promote rural development. In the

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conditions of globalization, financial instruments and regulatory mechanisms become important tools to support the agricultural sector, while entrepreneurship in agriculture is recognized as the driving force of innovation and economic growth. One of the main problems of financial regulation in agribusiness is inadequate financing and limited access to credit resources. Many farmers, especially in developing and transition countries, face difficulties in obtaining credit due to high risks and low profitability, which limits opportunities to modernize and increase productivity (Swinnen, 2018). Bogdanov, Božić, and Munćan (2008) state that the smallholder structure in Serbia is an additional challenge for the efficient use of financial instruments, while effective risk management requires the application of instruments such as crop insurance, forward contracts, and state subsidies. The topic of financial regulation includes various models of support (National Program of Agriculture of the Republic of Serbia, 2018–2021). Government support through subsidies, grants, and tax breaks reduces the financial burden of producers and enables investments in the modernization of production and the application of new technologies. International financial institutions, including the World Bank, provide loans and grants for agricultural development, which is especially important for countries with limited domestic investment and high business risks. Sedlak et al. (2016) point out that in transition conditions, it is necessary to adapt support mechanisms in order to stimulate entrepreneurial behavior, not just existential maintenance. The use of innovative financial instruments, such as microcredits, funds for startup projects, and financial derivatives, enables the reduction of uncertainty and encourages investment in new production technologies (Ferreira & Castro Junior, 2019). Accordingly, producers increasingly rely on crop insurance and index insurance, which provide better protection against financial losses caused by climate disasters (Abdi et al., 2022; Di Falco et al., 2014). Ferreira and Castro Junior (2019) show that forward and option contracts allow farmers to plan production and stabilize income in volatile market conditions. The integration of modern financial technologies in Serbia, including digitization and blockchain technologies, enables more transparent monitoring of supply chains, reduces the risk of fraud, and facilitates access to loans and subsidies (Aničić et al., 2023; Yadav & Singh, 2019; Li et al., 2020). Financial management software solutions further assist farmers in accurately tracking costs, planning investments, and estimating return on capital. The main goal of the research was to identify and analyze aspects of financial regulation of agribusiness with a focus on entrepreneurial initiatives in Serbia. The research included the analysis of innovative financial instruments, the assessment of the potential of financial technologies, and the study of the impact of environmental standards on financial regulation in the domestic context. Special attention was paid to the identification of obstacles to access to finance, including insufficient information for producers, complex administrative procedures, and high risk of losses. It also analyzed the role of the private sector and financial institutions in strengthening the capacity of farmers through microcredits, credit lines with reduced interest rates, and various types of insurance. The effectiveness of state support programs in increasing productivity and competitiveness was also evaluated, as well as areas in which legislative regulation can be improved. Taking into account global

trends, especially the impact of climate change, market volatility, and environmental regulations, effective financial regulation must combine government policies, international support, and innovative financial technologies to ensure sector stability, encourage entrepreneurship, and increase risk resilience. Continuous monitoring and evaluation of the effects of financial instruments are crucial for adapting to changes in market and climate conditions. The paper uses a combined methodological approach that includes qualitative and quantitative analysis of secondary data. The methods of comparative analysis, descriptive statistics, and inductive-deductive reasoning were used, with the aim of identifying key patterns in the financial regulation of the agro-industrial complex. The quantitative part of the research is based on the analysis of time series of selected indicators in the period 2018–2025, while the qualitative part includes the interpretation of regulatory models and institutional frameworks in the observed economies.

Literature review

Financial regulation of the agro-industrial complex is a key instrument for ensuring the stability of production, managing risks, and encouraging investments in agriculture. Contemporary literature by previously mentioned authors and researchers indicates a gradual transition from traditional forms of financial support, such as subsidies and credit lines, to integrated models that combine market mechanisms, institutional support, and digital innovations. One of the main challenges in the agricultural sector is limited access to financial resources, especially for small and medium-sized farms (Polukhin & Panarina, 2022; Bornhofen et al., 2019). Previous research results show that the insufficient availability of financing represents a significant limitation to the growth and development of entrepreneurship in agriculture, especially in developing and transition countries (Beck & Demirgüç-Kunt, 2006). This problem is further expressed in rural areas, where the financial infrastructure is less developed, which limits investment activities and modernization of production (Ilić, Stanković, & Ostojić, 2024). Risk management occupies a central place in modern approaches to financial regulation. Agricultural production is exposed to numerous threats to its business, including climate change, price volatility, and yield uncertainty. According to Garrido et al. (2017), the combination of public and market instruments, such as insurance, stabilization funds, and diversification of funding sources, significantly contributes to risk reduction. In this context, the institutional framework and the quality of public policies, according to Acemoglu et al. (2001), have for many years played a key role in shaping effective systems of financial support. The development of digital technologies significantly affects the transformation of financial flows in agribusiness. According to Aker & Mbita (2010), the application of mobile technologies and digital financial services enables easier access to financial services, especially in areas with limited banking infrastructure. Digitization contributes to the reduction of information asymmetries, increases transparency, and facilitates the making of investment decisions. Alternative sources of financing, such as crowdfunding and crowdlending, are gaining more and more importance in the modern agricultural

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sector. These models enable raising capital without the mediation of traditional financial institutions, which is particularly important for small producers and startup projects (Belleflamme et al., 2014). This increases financial inclusion and encourages the development of entrepreneurial initiatives in rural areas. Contemporary research indicates that tourism demand is becoming increasingly dynamic and unpredictable, which requires flexible management models and continuous adaptation of the offer to changing market conditions (Ilić & Anđelić, 2022). At the level of agricultural policy, the importance of an integrated approach to risk management and financial support is emphasized. Analyses show that successful systems combine various policy instruments, including subsidies, insurance, and investment incentives, to increase the sector's resilience to external shocks (OECD, 2020). In this sense, the development of competitiveness of the agricultural sector is directly related to the efficiency of financial and institutional mechanisms. In the context of transitional economies, special attention is paid to improving the competitiveness and efficiency of agribusiness. According to Matkovski and colleagues (2020), institutional reforms and the development of market-oriented financing models are key to increasing productivity and integrating into the international market. Additionally, contemporary literature emphasizes the importance of financial inclusion as a key factor in the development of the agricultural sector. Financial inclusion means the availability and use of financial services by all categories of producers, including small farms and vulnerable groups. According to Demirgüç-Kunt et al. (2018), previous research shows that increased availability of financial services directly affects productivity growth, income growth, and poverty reduction in rural areas. In addition, the development of agribusiness value chains has a significant impact on financing models. The integration of producers into organized supply chains enables better access to credit, safer placement of products, and reduction of market risks. According to Miller & Jones (2010), financing based on value chains is an effective model for improving the competitiveness and sustainability of the agricultural sector. Based on the review of the relevant literature, it can be concluded that modern systems of financial regulation in agribusiness tend towards the integration of traditional and innovative instruments. However, the successful implementation of these models depends on the level of institutional development, the availability of financial resources, as well as the degree of digitization and education of producers (Pavićević & Ilić, 2026). These factors represent the key determinants of the further development of the agricultural sector in countries such as the Republic of Serbia.

Methodology

The research used various data sources, including statistics from the Republic Statistical Office (RSO), reports and annual publications from the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia (2024), as well as international databases such as Statista (2024). These data enabled the monitoring of key economic and production indicators in agribusiness in the period from 2018 to 2025, including the value of production, investments in infrastructure, credit exposure, and the participation of small and medium-sized agricultural holdings in the financial system. Academic

publications used in the research included papers on innovative financial instruments, analyses of agrarian policy in Serbia, as well as studies on global trends in agricultural financing (Ferreira & Castro Junior, 2019; Heyl et al., 2021; Abdi et al., 2022; Bogdanov et al., 2008). The research provided a systematic analysis of existing financial regulations in the agribusiness sector, with the aim of identifying key trends, problems, and areas for improvement. The comparison of international experience included an analysis of support systems in the United States, the European Union, China, and Serbia, with a particular focus on measures that encourage entrepreneurship, stabilize producer incomes, and increase the sector's resilience to risks (Heyl et al., 2021; Aničić et al., 2023; Polukhin & Panarina, 2022). The paper examines how different countries combine subsidies, tax breaks, loans, and insurance as tools for financial stabilization and innovation. The research also included a critical assessment of the effectiveness of national and international support programs. Key indicators such as access to financial resources, the efficiency of subsidy programs, the degree of use of innovative instruments such as financial derivatives and crop insurance, as well as the implementation of modern financial technologies in agribusiness were analyzed (Ferreira & Castro Junior, 2019; Abdi et al., 2022; Kovačević et al., 2022; Stojanović et al., 2019).

Based on these data sources, the paper allowed the identification of the main challenges in domestic agribusiness, including insufficient financing, limited access to credit lines, high costs of adaptation to sustainable production standards, and limited application of digital technologies in financial management. It also pointed out the need to integrate international experiences into national policies in order to ensure better coordination between state institutions, financial organizations, and farmers. This multidimensional approach enabled the formulation of recommendations for improving financial regulation, as well as the identification of the potential for innovative financing instruments and technological tools that can contribute to the sustainability and competitiveness of agribusiness in Serbia.

Results

Agribusiness financial regulation plays a key role in ensuring the sustainable development of the sector. In recent years, there has been a growing interest in innovative financial instruments, such as agrifintech (Assa et al., 2025). Crowdfunding and crowdlending have become increasingly popular instruments, especially for small and medium-sized enterprises, as they provide access to capital independent of traditional bank loans. These tools reduce financial risk and enable faster start-up of investment projects, which is crucial for the development of entrepreneurial agriculture (Sedlak et al., 2016). Blockchain technology and the application of smart contracts ensure a high level of transparency and security of transactions, which is particularly important for tracking the origin of products and verifying quality standards (Mollick, 2014). These instruments can increase trust between producers, processors, and end consumers, as well as facilitate access to financial services such as loans and subsidies (Polukhin & Panarina, 2022). Index insurance is an innovative approach based on objective

indicators such as weather conditions, yields, or market prices. It allows for faster payments and reduces administrative costs, thereby promoting the financial stability of producers (Abdi et al., 2022; Stojanović et al., 2019). In addition, index insurance contributes to greater resilience of agribusiness to climate risks and price volatility, enabling long-term production planning (Di Falco et al., 2014; Moritz et al., 2025). The development of agrifintech platforms enables better access to financial services, as well as the integration of tools for risk management, supply chain monitoring, and financial planning (Assa et al., 2025; Kovačević et al., 2022). The integration of digital solutions also encourages greater efficiency, transparency, and sustainability in the entire agribusiness sector (Bornhofen et al., 2019). Although the application of these instruments in Serbia is still in its infancy, there is significant potential for development, especially in the context of climate risks and the need to modernize and improve access to financial services (Aničić et al., 2023; Lutovac et al., 2024). The introduction of agrifintech solutions can be key to stimulating innovation, strengthening entrepreneurial behavior, and increasing the competitiveness of domestic agribusiness in the European market (Glavonjić & Golubović, 2021). The results obtained indicate a positive correlation between the application of innovative financial instruments and the level of investment activity in the agricultural sector (Bornhofen et al., 2019; Assa et al., 2025). The role of digital platforms in reducing information asymmetries and transaction costs is particularly highlighted, which directly affects the increase in the availability of capital for small and medium-sized agricultural holdings (Lutovac et al., 2024). This finding confirms that the integration of financial technologies is a key factor in the transformation of traditional financing models in modern agribusiness.

The United States experience

The USA is one of the leading agricultural powers in the world, with a developed system of regulations and mechanisms for supporting agriculture. In the USA, the agricultural sector records a significant production value and a high export value of manufactured products, which makes it one of the most important participants in the global agricultural market (Coble & Barnett, 2012). According to Statista, in 2023, the value of US agricultural exports amounted to over 170 billion USD, which reflects the significant volume of trade activity of the country in the agricultural sector. The agricultural support system in the USA includes direct subsidies to producers, developed insurance mechanisms, risk management programs, and a comprehensive legislative framework, such as the “Farm Bill”, which includes credit support measures, modernization incentives, environmental programs, and other forms of financial assistance. These measures contribute to the stabilization of enterprise income, reduction of risks associated with price changes and climate conditions, as well as stimulation of innovation in agribusiness. Data on the total value of agricultural production in the United States are not readily available in a single public reporting table like exports, but estimates show that the value of agricultural production and the contribution of agriculture to the overall economy remain high, with increasing values over the past decade. For example, USDA data indicate that the value of

agricultural exports continued to grow in 2024, reaching one of the highest values at around \$176 billion, which testifies to the strong foreign trade position of American agriculture. These support mechanisms and the high value of exports are indicators of the effectiveness of the American system of regulations and incentive policies, which allow the stable functioning of the agricultural sector in the face of global economic challenges. Table 1 shows the growth trends in gross production value and export value in the period from 2018 to 2023.

Table 1. US agricultural output from 2018 to 2023, in billions of USD

Years	Gross production value	Export value
2018	≈ 375	≈ 83
2019	≈ 373	≈ 82
2020	≈ 391	≈ 90
2021	≈ 458	≈ 177
2022	≈ 543	≈ 196
2023	≈ 491	≈ 178

Source: Data processing based on Statista (2024)

Table 1 shows the trend in the gross value of agricultural production and exports in the United States from 2018 to 2023. Significant production growth is observed, especially in 2021 and 2022, which is a consequence of rising agricultural prices and increased global demand. The value of exports increases sharply from 2020 and reaches a peak in 2022. After that, in 2023, there is a slight decline, but exports remain at a high level. These data show that US agriculture is very competitive and has a strong impact on the global food market.

The European Union's experience

Agricultural production in the European Union is supported by the Common Agricultural Policy (CAP), which promotes environmental sustainability, competitiveness, and balanced rural development (Heyl et al., 2021; Bornhofen et al., 2019). Table 2 shows the value of agricultural production in the EU in the period 2018–2023.

Table 2. Value of EU agricultural production (total), in billions of EUR

Years	Value (billion EUR)
2018	≈ 435
2019	≈ 446
2020	≈ 417
2021	≈ 449
2022	≈ 537
2023	≈ 524

Source: Eurostat (2024)

Table 2 shows the total value of agricultural production in the European Union from 2018 to 2023. A decline is observed in 2020, which is a consequence of the disruption caused by the pandemic. This is followed by a recovery and significant growth, which

reaches a peak in 2022 (Aničić et al., 2023). The high value in 2022 is the result of rising agricultural prices and production costs. In 2023, there is a slight decline, but the value of production remains at a high level. The CAP focuses on direct payments to producers and the development of rural areas, to encourage sustainable production and increase competitiveness in the market. France and Germany are the largest beneficiaries of the funds, reflecting their significant participation in EU agribusiness. In addition to financial incentives, the CAP also includes measures to preserve the environment, certify organic products, and support innovation in agriculture (Heyl et al., 2021). The data shows that the total value of production in the EU is stable with a growth trend after 2020, indicating a positive impact of policy and support on the development of the sector.

China's experience

China has a dynamic agricultural support system, which includes subsidies for mechanization, modernization, the application of new technologies, and incentives for environmentally friendly production (Bornhofen et al., 2019). Table 3 shows the results of the gross value of agricultural production in the period from 2018 to 2023. Table 3 shows the growth of the gross value of agricultural production in China from 2018 to 2023. Continuous growth is observed year after year, without significant declines. This trend is the result of strong state support, modernization of production, and a large domestic market (Assa et al., 2025).

Table 3. Results of China's agriculture from 2018 to 2023

Year	Gross value (RMB billion)
2018	≈ 6145
2019	≈ 6635
2020	≈ 7775
2021	≈ 8300
2022	≈ 8835
2023	≈ 8970

Source: National Bureau of Statistics of China

The growth is particularly significant after 2020, when the agricultural sector is experiencing accelerated development (Abdi et al., 2022). China's agricultural policy emphasizes the strategic importance of supporting small and medium-sized producers, as well as the development of technologically innovative solutions to increase productivity. The subsidy system allows for the purchase of modern mechanization and the improvement of infrastructure for the storage and transportation of products. In addition, the government provides incentives for the application of digital tools, such as crop monitoring sensors and agrifintech platforms. The results show a continuous growth in gross production value, which indicates the effectiveness of these measures and their positive impact on the economic stability of the sector (Bornhofen et al., 2019). By implementing integrated policies, China manages to ensure a more balanced development of rural areas and increase the competitiveness of its products in the

global market. An additional effect is the encouragement of innovation in agribusiness and greater resilience to climate change and price volatility (Abdi et al., 2022). The government is also integrating crop insurance mechanisms and low-interest credit lines to reduce producer risks. Research shows that this support system is relatively flexible and adaptable to changing economic and environmental conditions. In addition, the support policy is also aimed at educating farmers and training them in the application of modern resource management techniques (Munćan & Živković, 2012).

Financial regulation and entrepreneurship in agriculture in the Republic of Serbia

Agriculture in Serbia is a strategic sector, but it faces problems of fragmentation, small scale of individual farms, and a lack of capital. Entrepreneurship in agriculture involves a transformation from subsistence to market production, which requires a different and more innovative approach to financing. Access to favorable sources of financing is key to the development of entrepreneurship, primarily through credit lines supported by state interest rate subsidies (Ljubičić et al., 2019). In Serbia, the support system includes direct incentives per hectare, subsidies for fuel and fertilizer, as well as special credit lines developed by the Ministry of Agriculture in cooperation with commercial banks (Ferreira & Castro Junior, 2019). The main challenge remains the high level of indebtedness of agricultural farms and difficulties in meeting banking requirements, including providing collateral.

Table 4. Basic indicators of agriculture in the Republic of Serbia (2018-2023)

Year	Agriculture's share in GDP (%)	Export of agricultural and food products (million USD)
2018	6,1	≈ 3.300
2019	6,2	≈ 3.620
2020	6,3	≈ 4.150
2021	6,7	≈ 4.900
2022	5,9	≈ 5.000
2023	6,0	≈ 5.400
2024*	6,1	≈ 5.600
2025*	≈ 6,0	≈ 5.800

Source: Republic Statistical Office of Serbia (RSO, 2024); Ministry of Agriculture, Forestry and Water Management of the RS (2024). *(estimate based on available trends)*

Table 4 shows the trend in the share of agriculture in Serbia's GDP and the value of agricultural and food exports in the period from 2018 to 2025. It is noted that the share of agriculture in GDP remains relatively stable and fluctuates around 6%, with minor oscillations due to weather conditions and economic trends. On the other hand, the value of exports is continuously growing, which indicates the increasing competitiveness of this sector in the international market. A particular decline in the share of GDP was observed in 2022, which is a consequence of unfavorable climatic conditions, such as drought.

Projections for 2024 and 2025 indicate continued growth in exports and stabilization of the importance of agriculture in the overall economy. Of particular importance for the development of entrepreneurial agriculture in Serbia are IPARD funds, which enable investments in farm modernization, product processing, and marketing (Sedlak et al., 2016). Migration of the population from rural areas is one of the key problems that can be solved by strengthening entrepreneurial business models, and not only by traditional subsidy measures. Rural development programs specifically target young farmers, providing them with start-up capital and professional support for starting business activities (Pavićević & Ilić, 2026). In addition to financial incentives, the emphasis is on education, professional training, and the application of modern technologies to increase productivity. Strengthening agribusiness encourages innovation and product diversification, which can increase competitiveness in domestic and foreign markets. Financial regulation in Serbia also includes support for crop insurance (Stojanović et al., 2019), the creation of venture capital, and access to agrifintech platforms. The support system seeks to increase the resilience of producers to economic and climate challenges, including price volatility and variable benefits (Ilić & Anđelić, 2022). The development of innovative financial instruments enables easier access to credit, as well as better risk management in small and medium-sized farms. The key effect of these measures is to stabilize incomes, encourage long-term investment, and reduce dependence on state subsidies. The analysis indicates that, despite the existence of various forms of state support, financial regulation in Serbia still has a limited capacity to encourage the development of an entrepreneurial model of agriculture (Ilić, Stanković, & Ostojić, 2024). A key problem is the insufficient integration of innovative financial instruments into the existing institutional framework, as well as the low availability of alternative sources of financing. Compared to practices in the European Union and the United States of America, there is an evident lag in the development of market-oriented financing mechanisms, which limits the competitiveness of domestic agribusiness (Ljubičić et al., 2019).

Discussion

Financial regulation plays a key role in the development of agriculture, ensuring the stability and predictability of agricultural producers' income. While developed countries, such as the US and the EU, are increasingly focusing on innovative instruments such as income insurance, index insurance, and smart contracts, transition countries, including Serbia, continue to face fundamental challenges in accessing capital. In Serbia, it is necessary to develop specific financial products tailored to the needs of farmers, taking into account the specificities of agricultural production, climate risks, and market price volatility (Njegomir et al., 2017). The introduction of blockchain technology in Serbia could contribute to solving the problem of mistrust between producers and processors, as well as improving product traceability, which is an important prerequisite for exporting to demanding EU markets (Mollick, 2014). This technology provides greater transparency of transactions and security, but, as in other countries, low digital literacy and underdeveloped infrastructure, especially in rural areas, remain significant obstacles.

Support programs for young farmers in Serbia show positive results, providing access to start-up capital, vocational training, and financial incentives (Bajagić et al., 2022; Lutovac et al., 2024). However, it is necessary to increase the intensity and scope of this support to retain the young population in rural areas, which is crucial for stimulating entrepreneurial behavior and innovation. Environmental standards are becoming an increasingly important factor in agriculture. The transition to “green” and organic production requires significant investments that are often inaccessible to small farms in Serbia without adequate financial support. Therefore, “green loans”, subsidies for organic production, and incentives for the application of environmental technologies are key elements of future financial regulation (Bajagić et al., 2022). At the same time, the integration of modern financial technologies and agrifintech solutions can facilitate access to credit, improve risk management, and increase productivity. The research results confirm that modern models of financial regulation are moving from a dominantly subsidy approach to integrated systems that combine market mechanisms, digital technologies, and risk management. In this context, Serbia is in a transitional phase in which it is necessary to redefine the role of the state – from a direct financier to a facilitator of the development of financial markets and innovative instruments (Njegomir et al., 2017). Such an approach would enable a more efficient allocation of resources and a long-term increase in the productivity of the sector. Education and training of farmers in the use of new tools and techniques are necessary in order to increase resilience to climate and economic changes. Financial regulation that combines traditional instruments and innovations enables income stabilization, encourages long-term investments, and reduces dependence on direct subsidies (Ljubičić, et al., 2019). In conclusion, Serbia has the potential to improve the system of financial regulation in agribusiness through the development of innovative instruments, support for young entrepreneurs, and the implementation of environmental standards, but it is necessary to provide a greater scope of support, improve infrastructure, and invest in education in rural areas to achieve sustainable and competitive agricultural production.

Conclusions

Research has shown that successful financial regulation in agribusiness requires the integration of traditional measures, such as subsidies, loans, and direct incentives, with innovative approaches such as fintech and agrifintech solutions, index insurance, and smart contracts. Analysis of the experiences of the United States of America, the European Union, and China indicates that the active role of the state in managing risks and ensuring the stability of the income of agricultural producers is crucial for the sustainable development of the sector. For the Republic of Serbia, the research results point to the need to continue reforms aimed at developing an entrepreneurial model of agriculture. It is necessary to simplify the procedures for obtaining loans and incentives, provide easier access to favorable sources of financing, and improve the education of farmers in the application of modern technologies and innovative tools. Also, more efficient use of pre-accession funds of the European Union, such as the IPARD program, can significantly contribute to the modernization of farms, development of processing, and

improvement of product placement. The development of agrifintech solutions in Serbia has significant potential to contribute to overcoming the problem of limited access to finance, improve risk management, and increase productivity. However, the successful implementation of these solutions requires coordination and cooperation between the state, financial institutions, commercial banks, and the educational system in order to provide comprehensive support to farmers. The improvement of financial regulation in the agro-industrial complex of Serbia requires a systemic approach that includes the development of institutional capacities, digitalization of financial services, and strengthening of market-oriented financing mechanisms. The integration of agrifintech solutions, the improvement of the regulatory framework, and the continuous education of agricultural producers are key prerequisites for increasing the competitiveness and sustainability of the sector.

However, the research has certain limitations. It is based predominantly on secondary data and comparative analysis, which may limit the depth of insight into specific institutional and market conditions in the observed countries. Also, the limited availability of completely comparable and up-to-date data for certain indicators can affect the comprehensiveness of the analysis. Future research should be focused on the quantitative evaluation of the effects of individual financial instruments on the productivity and competitiveness of the agricultural sector. A special focus can be on empirical analyses of the application of agrifintech solutions and their impact on small and medium-sized agricultural holdings. Also, a more detailed investigation of the role of institutional reforms and digital transformation in improving financial inclusion in rural areas is recommended, in order to enable the adoption of empirically based policies in the field of agrarian economy.

Conflict of interests

The authors declare no conflict of interest.

References

1. Abdi, M. J., Raffar, N., Zulkafli, Z., Nurulhuda, K., Rehan, B. M., Muharam, F. M., Khosim, N. A., & Tangang, F. (2022). Index-based insurance and hydroclimatic risk management in agriculture: A systematic review. *International Journal of Disaster Risk Reduction*, 67, 102653. <https://doi.org/10.1016/j.ijdrr.2021.102653>
2. Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review*, 91(5), 1369–1401. <https://doi.org/10.1257/aer.91.5.1369>
3. Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, 24(3), 207–232. <https://doi.org/10.1257/jep.24.3.207>
4. Aničić, J., Vujić, M., Aničić, D., & Vojinović, Ž. (2023). Serbian agrarian policy in the vortex of high inflation and geopolitical risks. *Economics of Agriculture*, 70(1), 309–321. <https://doi.org/10.59267/ekoPolj2301309A>

5. Assa, H., Liu, P., & Wang, S. (Eds.). (2025). *Quantitative risk management in agricultural business*. Springer. <https://doi.org/10.1007/978-3-031-80574-5>
6. Bajagić, M., Stošić, N., Rašković, V., Cvijanović, V., & Đukić, V. (2022). Potential of organic production from the perspective of youth in Serbia. *Economics of Agriculture*, 69(2), 411–424. <https://doi.org/10.5937/ekoPolj2202411B>
7. Beck, T., & Demirgüç-Kunt, A. (2006). Small and medium-sized enterprises: Access to finance as a growth constraint. *Journal of Banking & Finance*, 30(11), 2931–2943. DOI: <https://doi.org/10.1016/j.jbankfin.2006.05.009>
8. Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014).
9. Bogdanov, N., Božić, D., & Munćan, P. (2008). Rural non-agricultural economy of Serbia and poverty reduction. In *Agrarian and Rural Policy of Serbia 2* (pp. 19–32). DAES – Society of Agrarian Economists of Serbia. Retrieved from <https://daes.org.rs/wp-content/uploads/2023/10/2009-Poljoprivreda-i-ruralna-podrucja-Srbije.pdf>
10. Bornhofen, E., Ramires, T. G., Bergonci, T., Nakamura, L. R., & Righetto, A. J. (2019). Associations between global indices of risk management and agricultural development. *Agricultural Systems*, 173, 281–288. <https://doi.org/10.1016/j.agsy.2019.03.006>
11. Coble, K., & Barnett, B. J. (2012). Why do we subsidize crop insurance? *American Journal of Agricultural Economics*, 95(2), 498–504. <https://doi.org/10.1093/ajae/aas093>
12. Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, 29(5), 585–609. <https://doi.org/10.1016/j.jbusvent.2013.07.003>
13. Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. World Bank. DOI: <https://doi.org/10.1596/978-1-4648-1259-0>
14. Di Falco, S., Adinolf, F., Bozzola, M., & Capitanio, F. (2014). Crop insurance as a strategy for adapting to climate change. *Journal of Agricultural Economics*, 65(2), 485–502. <https://doi.org/10.1111/1477-9552.12053>
15. Eurostat. (2024). Agriculture statistics. Eurostat Database. Retrieved from <https://ec.europa.eu/eurostat>
16. Ferreira, J. B., & Castro Junior, L. G. (2019). Agricultural derivatives: The use of bibliometrics and sociometry. *Malaysian E-Commerce Journal*, 3(3), 11–17.
17. Garrido, A., Iglesias, E., & Blanco, M. (2017). Agricultural risk management in Europe. *Agricultural Systems*, 159, 1–4. <https://doi.org/10.1016/j.agsy.2017.07.001>
18. Glavonjić, B., & Golubović, S. (2021). The role of IPARD funds in the development of agriculture in Western Serbia. *Analytical Review*, 12(4), 110–125.
19. Heyl, K., Döring, T., Garske, B., Stubenrauch, J., & Ekaradt, F. (2021). The Common Agricultural Policy beyond 2020: A critical review. *Review of European, Comparative & International Environmental Law*, 30(1), 95–106.
20. Ilic, B., Andjelić, S. (2022). Management in Tourism and Integration of the Tourism Demand Segment, *JESD*, 9 (2), 21-31. https://www.jesd-online.com/dokumenti/upload/separated/JESD_9_2-25-35.pdf

21. Ilić, B., Stanković, S., & Ostojić, B. (2024). Key factors of promoting innovative performance in agrobusiness SMEs: A project using an empirical method. *Economics of Agriculture*, 71(1), 135-154 <https://doi.org/10.59267/ekoPolj2401135I>
22. Kovačević, V., Janković, I., & Minović, J. (2022). Crop receipts as alternative financial instruments. *Economics of Agriculture*, 69(3), 849–861. <https://doi.org/10.5937/ekoPolj2203849K>
23. Law on Agriculture and Rural Development of the Republic of Serbia. Official Gazette of RS, Serbia, No. 41/2009, 10/2013.
24. Li, X., Wang, D., & Li, M. (2020). Convenience analysis of sustainable e-agriculture based on blockchain technology. *Journal of Cleaner Production*, 271, 122503. <https://doi.org/10.1016/j.jclepro.2020.122503>
25. Ljubičić, I. D., Radenković, D., & Bulatović, I. (2019). Sustainability of agricultural farm financing in the Republic of Serbia. *Economics of Agriculture*, 66(4), 1201–1211. <https://doi.org/10.5937/1201-1211>
26. Lutovac, J., Borojević, N., & Djokić, A. (2024). The influence of factors on the costs of different types of loans in the agricultural business. *Economics of Agriculture*, 71(1), 311–330. <https://doi.org/10.59267/ekoPolj2401311L>
27. Lutovac, J., Veličković, M., & Zimonjić, M. (2024). Conditions of obtaining loans from the perspective of management of agricultural farms and medium-sized agricultural enterprises. *Economics of Agriculture*, 71(3), 1003–1016. <https://doi.org/10.59267/ekoPolj24031003L>
28. Matkovski, B., Zekić, S., Jurjević, Ž., & Đokić, D. (2020). The agrarian competitiveness of transition economies: The case of Serbia. *Outlook on Agriculture*, 49(1), 66–74. <https://doi.org/10.1177/0030727019899968>
29. Miller, C., & Jones, L. (2010). *Agricultural value chain finance: Tools and lessons*. FAO & Practical Action Publishing. <https://doi.org/10.3362/9781780442018>
30. Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia. (2024). Annual Reports and Publications. Belgrade: Ministry of Agriculture, RS.
31. Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29(1), 1–16. <https://doi.org/10.1016/j.jbusvent.2013.06.005>
32. Moritz, L., Kuhn, L., & Bobojonov, I. (2025). The impact of agricultural index insurance on farmers' welfare and climate resilience. *Australian Journal of Agricultural & Resource Economics*, 69(3), 598–610. <https://doi.org/10.1111/1467-8489.70023>
33. Munćan, P., & Živković, D. (2012). *Management of agricultural business systems*. Faculty of Agriculture, Belgrade, Serbia.
34. National Bureau of Statistics of China. (2024). China Statistical Yearbook: Agriculture. Retrieved from <http://www.stats.gov.cn>
35. National Program of Agriculture of the Republic of Serbia (2018–2021). Official Gazette of RS, Belgrade, Serbia.
36. Njegomir, V., Pejanović, L., & Keković, Z. (2017). Agricultural entrepreneurship, environmental protection, and insurance. *Economics of Agriculture*, 64(3), 1035–1047. <https://doi.org/10.5937/ekoPolj1703035N>

37. OECD. (2020). *Strengthening agricultural resilience in the face of multiple risks*. Paris: OECD Publishing. <https://doi.org/10.1787/2250453e-en>
38. Pavićević, N., & Ilić, B. (2026). *Methodology for evaluating development opportunities of sustainable projects through economic-ecological management of natural resources*. Niš, Serbia: Društvo ekonomista Ekonomika.
39. Polukhin, A. A., & Panarina, V. I. (2022). Financial risk management for sustainable agricultural development based on corporate social responsibility. *Risks*, 10(1), 17. <https://doi.org/10.3390/risks10010017>
40. Republic Statistical Office of Serbia (RSO). (2024). *Statistical Yearbook of Agriculture*. Belgrade: RSO.
41. Sedlak, O., Jovin, S., Pejanović, R., Ćirić, Z., & Eremić Đodić, J. (2016). Access to finance for micro, small, and medium-sized business units in Serbian agribusiness. *Economics of Agriculture*, 63(4), 1219–1235. <https://doi.org/10.5937/ekoPolj1604219S>
42. Statista. (2024). *Agriculture – United States*. Retrieved from www.statista.com
43. Stojanovic, Z., Rakonjac-Antic, T., & Koprivica, M. (2019). Farmers' willingness to purchase crop insurance: Evidence from wheat and raspberry sectors in Serbia. *Economics of Agriculture*, 66(4), 1107–1125. <https://doi.org/10.5937/ekoPolj1904107S>
44. Swinnen, J. F. M. (2018). *The Political Economy of Agricultural and Food Policies*. Palgrave Macmillan.
45. Yadav, V. S., & Singh, A. R. (2019). A systematic literature review of blockchain technology in agriculture. In *Proceedings of the International Conference on Industrial Engineering and Operations Management* (pp. 973–981). IEOM Society International.