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Prospective Effects of Transformation of Forms of Credit Relations in Ecosystems

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Abstract: The relevance of developing credit relations in ecosystems is associated with the growing popularity of platform and ecosystem business models not only in innovative industries and E-commerce, but also in traditional industries such as agriculture. FinTech, in particular Open API and the related concepts of Banking As Services and Embedded Finance, significantly change the form of implementing credit relations, turning a loan into an embedded service. Another factor is the convergence of government digital services and the formation of an industry ecosystem that ensures proactive receipt of government services, in particular preferential lending. The purpose of this article is to identify promising effects from the transformation of forms of credit relations in industry ecosystems of the agro-industrial complex. It is shown that for credit institutions, the positive effects of joining third parties and developing their own ecosystem solutions are associated with the use of information and network effects and are manifested in: mitigating geographic and administrative barriers to entry into the industry market, leveling the playing field with state-owned banks, reducing transaction costs, deepening partnerships between financial market entities, developing tools for monitoring and automating transactions, growing a new client base, increasing lending volumes, and diversifying the loan portfolio. For agro-industrial complex entities, the ecosystem model for satisfying credit needs is attractive due to: increased convenience and expanded consumer choice, faster and simpler loan application review procedures, and comprehensive satisfaction of financial needs. For the state, noticeable positive effects can be seen in the case of developing ecosystem business models based on the collaboration of government and business services, which will contribute to: increasing the efficiency of budget expenditures to support the agro-industrial complex, expanding the possibilities for automating routine control procedures, developing new channels and tools for implementing state agricultural policy.

1 INTRODUCTION

One of the key trends in the modern economy is the growing popularity of platform and ecosystem business models, driven by FinTech and E-commerce. The emerging changes affect not only trade and services, they significantly change the architecture of the payment and financial market, forcing traditional financial intermediaries to adapt competitive strategies to maintain a market niche. In practice, this is reflected in the formation of their own ecosystems by banks (Sber, T-bank, Rosselkhozbank, etc.), in the acquisition of banking businesses by innovative or trading ecosystems (Yandex Bank, MTS Bank, Wildberries Bank, Ozon Bank, etc.), or in the convergence of the activities of non-financial ecosystems, banks and FinTech companies in embedded financing services. Regardless of the specific competitive strategy, at the level of the user of ecosystem products, financial services, including credit services, are becoming a familiar element of their everyday transactions, which significantly changes the form of their receipt (they are available proactively and remotely) and forms the corresponding consumer preferences.

With regard to credit relations, their implementation within ecosystems, in addition to embedded financing instruments, is associated with the formation of at least two independent business models. The first is the basis for the activities of financial information aggregator sites (World of Interest, Vyberu.ru, bankiros, etc.), whose activities are associated with selecting the best offer for the client and submitting requests to banks or

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microfinance organizations on his behalf, with subsequent interaction between the lender and the borrower occurring as usual. The second is represented by financial platforms (marketplaces) for individuals registered in a special register of the Bank of Russia (their number has reached 9). Their activities are distinguished by the ability to make financial transactions directly in the marketplace information system, that is, in addition to information services, they form the infrastructure for communications and payments between the lender and the borrower. Further development of FinTech and information security technologies will contribute to the emergence of full-fledged financial marketplaces for legal entities, including those based on blockchain and decentralized (DeFi) finance.

In agriculture, the immediate prospects for the development of an ecosystem model of credit relations are associated with the integration of disparate industry state information systems (GIS) into a single information system of digital services of the agro-industrial complex, integrated with the Unified Identification and Authentication System, the State Services portal and other GIS. The project will begin in March 2026, and in 2028, the design of all measures of state support for the agro-industrial complex will be transferred to a proactive digital format, including in the field of preferential lending. Even greater transformations in the form of credit relations in the agro-industrial complex can be expected as a result of the formation of hybrid ecosystems (Korobeynikov, 2024), combining commercial and state services in a single architecture.

The aim of the article is to identify the promising effects for credit institutions, industry borrowers and the state from the transformation of forms of credit relations in the ecosystems of the agro-industrial complex.

2 MATERIALS AND METHODS

The foundations of the study of digital ecosystems are laid in the works of Thomas L., Autio E. (Thomas, Autio, 2020), Jacobides M. G., Cennamo C., Gawer A. (Jacobides, Cennamo, Gawer, 2018), Shastitko A.E., Kurdin A.A., Filippova I.N. (Shastitko, Kurdin, Filippova, 2023), Foss N., Schmidt J., Teece D. (Foss, Schmidt, Teece, 2022), Gawer, A. (Gawer, 2021). The problems of ecosystem development in the financial sector and the development of financial relations in business ecosystems are studied by Kleiner G.B., Rybachuk M.A., Karpinskaya V.A. (Kleiner, Rybachuk, Karpinskaya, 2020), Stepnov I.M., Kovalchuk J.A. (Stepnov, Kovalchuk, 2023), Ray, S., Pal, R.P. (Ray, Pal, 2022). The issues of ecosystem development in the agro-industrial complex are covered in the works of Treiber M., Theunissen T., Grebner S., Witting J., Bernhardt H. (Theunissen at all, 2023), Kivarina M., Yurina N. (Kivarina, Yurina, 2024), Korobeinikova O.M., Korobeinikov D., Popova L., Chekrigina T.A., Melihov V. (Korobeinikova at all, 2023).

The mega-regulator – the Bank of Russia, and the Ministry of Economic Development pay great attention to the development of ecosystem and platform business. In recent years, analytical reports, information and analytical materials, reports for public discussions on various issues of development of platforms and ecosystems of financial and non-financial organizations have been presented (for example, “Ecosystems: approaches to regulation” (https://cbr.ru/Content/Document/File/119960/Consultation_Paper_02042021.pdf), “Overview of platform services in Russia” (https://cbr.ru/Content/Document/File/146720/platform_services_20230515.pdf), “Concept of general regulation of the activities of groups of companies developing various digital services based on one ecosystem”(https://www.economy.gov.ru/material/file/cb29a7d08290120645a871be41599850/koncepciya_21052021.pdf), etc.).

However, in the regulatory framework and in specialized literature, the problems of transforming the form of credit relations in ecosystems are often overlooked. It is noted that financial technologies contribute to the modernization of traditional areas of financial services, including those related to lending (Glebova, Ivanovskaya, Lukashenko, 2022), individual models of fintech lending are considered, such as crowdlending, Peer-to-Peer lending, marketplace lending and others (Gorda, 2024), open banking and embedded financing technologies (Awrey, Macey, 2023), but the resulting effects are practically not studied. In this article, the possible effects of the development of ecosystem lending will be considered in the context of the logic of the development of financial and non-financial ecosystems in the agro-industrial complex, as well as their interaction with the unified information system of digital services of the agro-industrial complex, which in the future will ensure the formation of a common digital environment within the framework of industry value chains.

3 RESULTS AND DISCUSSION

As a basic scenario for the development of ecosystem forms of business in the agro-industrial complex, we consider the gradual convergence of corporate and government ecosystems. Such hybrid organizational models will eventually form a single digital infrastructure that will provide users with seamless access to financial and commodity markets, commercial and government services in a common interface, allowing actors to meet a variety of economic needs and proactively receive government services and support measures. That is, they will allow the potential of the ecosystem form of credit functioning to be fully revealed through the absorption and expansion of the functionality of digital and financial platforms. Therefore, this promising business model will be considered as the basis for predicting the prospective effects for different groups of actors from the transformation of forms of implementation of credit relations in ecosystems.

1) For credit institutions, the positive effects of joining third parties and developing their own ecosystem solutions can be associated with the use of information and network effects arising in the ecosystem:

- Softening of geographic and administrative barriers to entry into the industry loan capital market: a) the removal of geographic restrictions is facilitated by the possibility of remote interaction with borrowers and other actors on digital platforms of industry ecosystems (or within the framework of other third-party or own ecosystem solutions), making the physical presence of banks and other financial institutions not only in rural areas, but also in the regions unnecessary; b) the easing of regulatory restrictions will ensure the implementation of administrative functions by the Ministry of Agriculture of Russia within the contour of industry ecosystems, which will create conditions for simplifying the procedures for admitting banks to preferential lending programs for the agro-industrial complex.

- Leveling the playing field for competition with state-owned banks (Sberbank and Rosselkhozbank) that have monopolized the market. This effect will be most pronounced within the framework of the infrastructure industry ecosystem (its model is presented in the author's earlier studies (Korobeynikov, 2024)), since its architecture will ensure: a) equidistance from participants, excluding information asymmetry and information discrimination of any groups of actors; b) increased attractiveness of the agro-industrial complex as an object of lending due to simplified access to preferential lending programs and accompanying procedures for interaction with the Ministry of Agriculture of Russia, as well as scaling the ecosystem channel for promoting credit products (not only on preferential, but also on market terms) in general to a large sector of the economy. An increase in the number of participants and the absence of preferences for state banks will objectively lead to market compaction and increased intensity of competition.

- Reduction of transaction costs based on information effects arising in the ecosystem. The main information advantages for creditors, typical in general for any ecosystem solutions, may be associated with: a) simplification of the procedure and increased reliability of the borrower's creditworthiness assessment - partial automatic formation of the borrower's credit profile is possible based on disclosed (taking into account legislative and other restrictions) data on his actions and operations within the ecosystem (the infrastructure industry ecosystem will additionally provide access to the information bases of the Ministry of Agriculture of Russia and other departments); b) formation of the client information profile and customization of the offer for various target groups of borrowers - the openness of the information generated by the ecosystem and its availability in an impersonal form to any interested actors will increase the efficiency of bank marketing and the targeting of credit offers. The infrastructure industry ecosystem will additionally ensure a reduction in transaction costs when interacting with the Russian Ministry of Agriculture, for example, authorized banks within the framework of the preferential lending mechanism when determining and confirming budgetary obligations for subsidies to reimburse interest rates, since the ecosystem will ensure transparency of the relevant transactions for the department.

- Development of partnerships between financial market entities. The functionality of the infrastructure industry ecosystem will ensure seamless interaction (based on the "one-stop shop" principle in the personal account on the ecosystem platform) between creditors and the national guarantee system in terms of lending to small and medium-sized agricultural businesses. Relationships between banks, leasing companies, insurers, appraisers and other entities should be built in a similar manner, giving the borrower the opportunity to receive a comprehensive financial product in a single user interface and forming long-term partnerships between financial market participants. In addition, through the infrastructure industry ecosystem platform, innovative banks that form their own financial ecosystems are given the opportunity to promote them in rural areas, which will support healthy competition between different ecosystem business models.

- Development of transaction control and automation tools. Localization on the technological platform of the infrastructure industry ecosystem of the main legal actions and financial transactions that constitute the content of the mechanism of preferential lending, including approval by the industry ministry and budget subsidies, will allow the implementation of the entire system of emerging relations in the form of a smart contract containing all restrictions and controlled parameters. In addition to preferential lending in the form of smart contracts, other forms of bank lending and partner financing can also be implemented.

- Growth of the new client base, volumes of lending to the real sector and diversification of the loan portfolio. Building additional communication channels with clients throughout the Russian Federation within the framework of various ecosystem business models, deepening involvement in industry value chains, convenient business services and facilitating access to state programs for preferential lending to the agro-industrial complex will have a positive impact on the main quantitative parameters of lending operations in this sector of the economy.

2) For economic entities in the agro-industrial complex, satisfying credit needs within the framework of financial platforms or ecosystems may be attractive due to the following positive effects:

- Increased convenience and expansion of consumer choice. The technological search service that forms the user interface of financial platforms or ecosystems provides the ability to automatically compare, facilitating the selection of the "best" offer on the market (starting from the choice of the method of debt financing and ending with a specific credit product of a specific lender) in accordance with the requirements. The breadth of consumer choice will be ensured by the attractiveness of platforms (ecosystems) for banks and other financial intermediaries, stimulating the growth of the supply of loan capital through this sales channel, and the removal of geographic barriers due to remote interaction and advanced user selection tools for potential borrowers against the background of growing supply will help limit the market power of lenders and increase competition.

- Acceleration of the loan application review procedure. For industry clients, the ecosystem form of credit relations implementation will primarily be able to have a positive impact on solving one of the key problems of seasonal short-term agricultural lending - the time frame for reviewing a loan application by a bank and its approval by the Ministry of Agriculture of Russia (in the case of preferential lending). Accumulation and generalization of information on requests and transactions in the information system of the infrastructure industry ecosystem, partial disclosure of information (primarily reporting) on potential borrowers by the Ministry of Agriculture of Russia and other actors will significantly improve the quality of credit scoring and the speed of review of loan applications.

- Simplification of the procedure for preparing a credit application. The ecosystem business model for organizing credit relations, as a rule, in one form or another provides for credit consulting services, partial or full preparation of a credit application, communications with selected banks during the process of its approval. Such services are especially important for small agricultural businesses, which do not always have the financial and legal competencies necessary to implement the procedures for submitting and confirming a credit application.

- Ensuring comprehensive satisfaction of financial needs. Along with lending, the ecosystem model can offer the client a range of complementary services (insurance, collateral assessment, guarantees, statements from credit bureaus, etc.), allowing the formation of a comprehensive financial product that satisfies several financial needs at once in one offer. An additional advantage of the industry ecosystem will be the ability to proactively receive government services, budget subsidies and other measures of state support for the agro-industrial complex.

3) For the state, the most noticeable positive effects can be seen in the case of the development of ecosystem business models based on the collaboration of state and business services. The formation of an infrastructure industry ecosystem in the agro-industrial complex that puts this idea into practice will contribute to:

- Increasing the efficiency of budget expenditures to support the agro-industrial complex. Various forms and instruments of debt financing on the platform of the infrastructure industry ecosystem will proactively complement complementary measures of state support that ensure the preferential nature of agricultural credit. The efficiency and automatic mode of implementation of such measures will contribute to the growth of the multiplier, formally characterizing the efficiency of budget expenditures to support preferential lending to the agro-industrial complex - the amount of issued preferential loans per ruble of budget subsidies. Along with this, the integration of credit and government support measures into industry value chains will increase the overall multiplication of loan capital, which will be expressed in the growth of the size of the industry gross product per ruble of preferential loans (this indicator will more objectively characterize the effectiveness of budget expenditures). The possible manifestation of this effect is associated with the expected growth in the efficiency of the functioning of the credit and, in general, the economic mechanism of the agro-industrial complex in the contour of the infrastructure industry ecosystem.

- Expanding the possibilities of automating routine control procedures. For the Ministry of Agriculture of Russia, which is a system actor and IT integrator of the infrastructure industry ecosystem, all business transactions carried out within its framework will be transparent and personalized. This will create the prerequisites for automating routine procedures related to the definition and fulfillment of budgetary obligations for subsidies, including preferential loans, and will also significantly reduce the administrative burden on the department. The implementation of the mechanism of preferential lending (and other forms of preferential debt financing) in the form of smart contracts will allow integrating all controlled parameters and restrictions directly into its software algorithm, which will ensure automation of not only the execution, but also the monitoring of such contracts.

- Development of new channels and instruments for implementing state agricultural policy. The infrastructure industry ecosystem will form a digital channel for interaction between the state and economic entities of the agro-industrial complex. Proactive, remote provision of state support measures will increase the efficiency and targeting of the application of agricultural policy instruments, and information on transactions and prices generated by the ecosystem will provide feedback from the markets to monitor the effectiveness of the measures being implemented. Additionally, the functioning of the infrastructure industry ecosystem will support competition and digital innovatization of the agro-industrial complex. Competition will be enhanced by the equal distance of the ecosystem from the participants and its non-commercial nature, excluding the possibility of information discrimination against individual suppliers of services or goods, and the absence of restrictions on the number of suppliers of the same services and the reduction of barriers to entry into industry markets will objectively weaken the market power of individual banks (primarily Russian Agricultural Bank and Sberbank), suppliers, exporters, etc. To promote digital innovations in the industry, the ecosystem will ensure the formation of digital habits of users, the diffusion of digital innovations from the financial and public sectors to agriculture. The platform can also function as a business incubator, where a budding entrepreneur receives a full range of consulting, government, financial and other digital services.

In the context of the authors' proposals, the issue of the advisability and possibility of forming an industry-level ecosystem that unites commercial and government services, including for the implementation of a mechanism for preferential lending to the agro-industrial complex, remains debatable. In modern studies devoted to ecosystems, the role of the state is often interpreted more broadly than simply regulating and supporting market competition, for example, in the context of the heterogeneity of participants, manifested not only in "covering several industries, but also in attempts to overcome the boundaries between the public and private sectors" (Thomas at all, 2024). Consequently, in terms of subjectivity, the understanding of economic ecosystems goes beyond the boundaries of a simple set of interconnected entrepreneurial structures, and can include government agencies and financial institutions in the composition of ecosystem participants (Carliss, 2020). That is, the current restrictions on the interaction of state and corporate ecosystems lie in the plane of information security and technical compatibility, the overcoming of which will be facilitated by the development of digital technologies.

Researchers come to similar conclusions in matters of forming a single digital ecosystem in the agro-industrial complex. Noting the tendency for digital ecosystems to dominate in many markets, M. Treiber, T. Theunissen, S. Grebner, J. Witting, H. Bernhardt (Treiber at all, 2023) conclude that such dominant solutions are not yet available in the agricultural market, being replaced by a multitude of digital solutions within its segments. Therefore, one should agree with the opinion that “the tasks of industry digitalization are too great for one company ... and we should not talk about disparate systems and services, but about a platform that enables the joint work of disparate systems and organizations” (Akatkin at all, 2017), that is, a single ecosystem solution implemented on an industry-wide scale, including with state participation.

4 CONCLUSIONS

It is substantiated that the incorporation of credit relations into the business models of non-financial digital ecosystems of agribusiness will affect their form, since the integration of financial services of fintech companies and traditional financial intermediaries leads to the transformation of classic banking products into proactively accessible services built into the marketplaces preferred by users and into the value chains of industry business ecosystems. The identified promising ecosystem effects will be most noticeable in the segment of small and medium-sized businesses, for which the availability of services of traditional financial intermediaries is objectively limited. At the same time, the functioning of the loan as a built-in service will contribute to the transformation of business models of digital platforms in agriculture, contributing to their transformation into multifunctional industry ecosystems, including in the form of collaborations with digital government platforms and services, which will increase the availability of preferential lending for industry borrowers.

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