

Issues on Diffusion of Digital Payment Innovations in Agribusiness in Russia

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Abstract— The article states that to achieve the advanced development in agrarian sector and to ensure food sovereignty of Russia it is required to introduce a digital economy model. Diffusion of financial digital innovations into agriculture can occur through industrial adaptation of platforms and technologies, on the basis of which general and specific competencies are formed to develop payment and adjacent markets. The identified tendencies indicate towards the reduction in physical presence of banks and other financial institutions located in the peripheral territories relating to the federal center that could be agents of digital innovations in agribusiness sector. The applicability of new technologies (cloud technologies, big data, artificial intelligence and robotics, open interfaces (API), biometrics, distributed registries, mobile contactless technologies) used by representatives of agribusiness is considered. It is proposed to develop the regional banking sector and the regional payment infrastructure that create conditions not only for leveling the economic development of the regions, but also making it possible to increase the availability to innovative financial technologies that can be used in agribusiness and in other traditional industries. We propose the measures of territorial diversification to make payments and of the infrastructure development and of the diffusion of digital payment innovations used in agriculture.

Keywords— *agricultural territories, agribusiness, payment systems, payment infrastructure, payment services, digital economy*

I. INTRODUCTION

With the enactment of the Federal Act on the national payment system, in Russia the activities have intensified with the view of developing the relevant infrastructure for it, including payment system itself and its services (O.M. Korobeynikova, 2012). However, the ongoing processes address primarily urban conglomerations and financial centers of the country. Many financial as well as the payment services are not available enough for remote populations of rural areas that impedes their socio-economic recovery. The reason for it,

to our opinion, is insufficient level concerning the high-speed Internet access over the whole country and its low security. Additionally, in Russia the conventional views on making financial operations are still in dominating position. As developers involved into the implementation the State program “Digital Economy of the Russian Federation” noted that at present only 10 % of the municipal institutions meet the requirements set by the Government in terms of digitalization. Leveling the socio-economic development in different country territories is possible, to the authors’ opinion, due to the digital innovations in the economy sector. We assume that the payment systems, which are in mass servicing, should be “a conductor” in launching digital innovations in traditional economy sectors, such as agriculture.

II. MATERIALS AND METHODS

The idea about the digital economy in Russia is coming from the Conception on Economy Security, Modernized Society Development, and Information Society Strategy. The forecast in long-term social-economic development of Russia, with the purpose of rapid development and providing the national sovereignty, states the necessity to create the digital economy model, which will be based on the national innovation platforms and breakthrough technologies (I.D. Anikina *et al*, 2016).

The digital economy is considered as the vector of civilized development bot in Russia and abroad (M.L. Bech *et al*, 2008), (J.E. Stiglitz and A. Bhattacharya, 1999); there is an opinion that the global competitiveness can be achieved only through a new technological setup, which at the current stage of technological advancement is linked with digitalization and informatization of all social and economic spheres.

The level of the global competitiveness in the national economy and in the rapid development of all economic sectors in general can be achieved through the financial sector as a driver, and the payment systems in particular. All they are able

to be a conductor and accelerator for implementing the digital innovations, including the agricultural sector.

The agricultural sector ensures in general the state food security but it is very sensitive to different categories of risks, as natural and anthropogenic ones (Y. Kozenko *et al*, 2016), among them – information asymmetry that is based on the information security risks. The digital innovations are able to minimize a greater part of these risks, including particular natural ones. Agriculture in the whole world deeply depends on the state support provided in different forms – donations, protections, and etc. (R. Skokov, 2013). By supporting the program implementation oriented to digital economy measures in the agricultural sector, the State can save not only the food sovereignty and export potential of the agricultural sphere but to gain higher rates in GPD growth.

The practice shows that the payment systems and services that are the ground for the payment market, have the potential to solve the issues described above, and not only as a transmission mechanical tool but either as an accelerator in creating the digital self-developing society.

The payment systems as part of the financial world have the following properties:

- operating respond in changing inquiries involved into the economic relations,
- quickness of the scientific and technological progress diffusion, including the digital innovations,
- high degree of risks adaptation, expressed in the dynamic of innovations intrusion into the State financial system;
- openness and inherent aspiration to expansion of the territorial and operational borders, which include the potential to self-development and ability to integrate organically into the global infrastructure of the digital economy.

Theoretical reflection and practical experience on issues relating to institutionalization and modernization of the agricultural economy in Russia at the different stages of its historical development have been implemented in the context of the food security with traditional technological setup domination. As a result we observe a technological gap that can be demolished or minimalized through the digital innovations application of which will be possible when special methodologies have been developed. It can be done through increasing the availability of updating payment services and optimizing the mechanisms of communication between representatives of the agricultural sector and other players at the market.

In spite of the fact that already in post-Soviet time the fundamental Russian basis was developed it is not enough to ensure the global competitiveness in the economic security and sovereignty in dynamically changing conditions affected by environment digitalization. Nowadays, it is required the up-front technological advancement as in financial, resource extraction industry, IT-sector and in agricultural economy as well.

The dynamics of changes in IT-based communication systems creates the situation of a long gap between theory and practice, particularly regarding the potential of the digital economy for the agricultural sector. Geo-economic and political challenges, which have the orientation on the protectionism of the national economic objects, activated the applied scientific research but it is too early to speak about the holistic approach to development of the entire industrial theory on the digital economy counting the specificity of the national market and industry (D.D. Burkaltseva *et al*, 2017), on betterments in financial mechanisms used in Russia and its payment systems, which are trying to launch the impulses of the digital economy in the agricultural sector (O.M. Korobeynikova and D.A. Korobeynikov, 2015).

III. RESULTS AND DISCUSSION

A. *The current state of digitization of Russian economy and its agricultural sector*

Agriculture is one of the real sectors that form state economic security in term of providing the food security to population (A.V. Nemchenko *et al*, 2016). This traditional sector of economy that is based on land, labour and material resources. Despite the conventionality of the agricultural setup, productive resources and labour relations, this sector, needs to be invested not only technological but technical and financial innovations able to be generated in symbiosis of financial and IT-sectors. The tendencies of the recent time leading to reducing the physical presence of banks and other financial organizations, particularly in the peripheral towards the federal center territories, are proved with the importance of the innovation methods and mechanisms covering the interaction between economic agents, who work in rural areas. In order to solve the issues stated, in Russia there was adopted the Strategy on development of information-based society. The Strategy declares the promotion of human (population) rights towards the access to information; the State program Digital Economy has been launched; the project on providing the access to all state and municipal services via the Internet and to multi-functional centers is already in active operation. The main aim of Digital Economy program is to facilitate totally all economic agents and population to work in the environment of digital interaction in external settings due to the shared economic ecosystem (D. Burkaltseva *et al*, 2017). Universality and cross sectional nature of this program allow to have a hope that the digital environment will be spreading equally over the territorial borders of big cities and will be in use in difficult to access regions of the country providing the localization to all agents engaged into the work of the agricultural sector.

B. *Digital and payment innovations in agribusiness*

Diffusion of financial and digital innovations into the agricultural sector can occur on the basis of an economic sector platform and technologies adaptation, which are involved into the competence-based preparedness to develop own payment and adjunct markets. The financial market at present is developing in tight symbiosis with information

technologies (Yu.I. Korobov, 2015), the product of which are FinTech-trends, offered by symbiotic FinTech-companies.

Over the past few years, as a result of global trends relating to economy and society informatization, there has been an explosive growth of FinTech companies; new opportunities and tools used in a fight for a client have appeared; new platforms helping to create new types of business models that are being developed jointly by banks and high-tech software companies have been designed and offered.

To the example of innovative and perspective trends in development of payment services and systems we can refer the following groups of new technologies:

- cloud technologies;
- big data;
- artificial intelligent and robotics;
- open interfaces (API);
- biometrics;
- distributed resources;
- mobile contactless technologies.

The technologies introduced here in the world financial community and as well as in the Russian market are considered as key drivers in the view of transformation of the traditional business models, so called “analogue economy”. Cloud technologies allow economic agents to locate by downloading big data in a cloud that reduces costs on storing and transmitting information. In agribusiness it can be not only financial data but either some technological information about land, material, labour and financial resources; about dynamics of crop yield, animals’ productivity and etc. the big data technology enables to achieve a new qualitative level in generalization and analysis of information with the help of necessary tools and algorithms. All these are very important for the agricultural sector in order to make forecasts about future productivity and to program yield data and to plan an ecological monitoring.

Artificial intelligent and robotics replace human labour, multiplying the rate of its productivity and functionality. In agriculture of Russia there is the deficit for labour resources to be engaged into labour-consuming and low-status jobs that are needed in robotics-based automation.

The technological domain covering open interfaces is actively discussed in the bank sector community that is caused with introduction of the blockchain technology used to centralize payments without brokers. In agricultural sector the development of centralized blockchain-based platform is very reasonable that allows to create a good data base about agricultural producers, resources suppliers, agricultural production processors, logistic centers and etc. The technology of open interfaces, declared in the European Union, gives the opportunity both to banks and other organizations to get the access to clients’ accounts within following stated rules and algorithms. The trend applied in biometrical processing the data deals directly with interests of individuals. If the ethical

conflicts are depleted or are not at the stage, the technology of identification and consolidated database giving the data about clients/individuals gives the opportunity to any bank or any financial organization carry out operations upon instructions from an individual and without its physical presence. In non-financial activity that might take place in the agricultural sector the biometrics is appropriate to apply in qualitative identification of the biological assets.

The distributed registries are tested enough technology existing at the financial market and which has been already proved its promising. As other innovations, the innovations described here are at the stage of their first implementation, which is intended to identify situations with potential risks, where the methods on their minimization is a prospect to be developed or defined.

It is assumed that the technological ground of the innovative digital environment will constitute “cloud” computing based on the concepts of robotics and artificial intelligent, neurotechnology and biometrics, operations with big data based on the technology of distributed registries (blockchain).

Adaptive innovation platforms and technologies are forming the updated segments of the financial market (FinNet) and the payment market, included in its structure (PayNet). Such promoting prospects of the payment market to be used by clients of the real economic sector and the agricultural sector as well are: cloud and mobile services, big data operations, open interfaces, and the Internet of things. The tight synergetic interaction, in our opinion, is reasonable to be supported through a consortium that will unite the megaregulator or the Ministry of Economy and other authorities of financial and technological market agents.

The payment industry has been changed significantly for the recent years due to the rate of innovations implementations at the market. The motto – simply, comfortably and securely - is applicable. This motto is implemented through a phenomenon of digital technologies penetration into all spheres of human life. The diffusion property we classify as the basic one in the process of accelerating digital innovations in the Russian agricultural economy. The digital innovations underline the necessity to make some transformations in banking and payment sectors with the view to export them to other adjunct segments.

Today a financial-technological company is in competition with banks more and more. Since FinTech-companies offer more advanced solutions for digital payment industry. To mitigate the competitiveness some leading Russian banks create their own FinTech laboratories and domestic FinTech companies belonging to banks. In implementing new technologies and in offering new products to their clients, banks foresee the ground to sustainable development and to regions’ market entry.

C. Role of regional financial structures in digitalization of rural territories

Since 2014 the Bank of Russia as the megaregulator conducts the policy oriented to reorganization of the financial

sector with the aim to ensure its qualitative improvement and creates the groundwork for innovative digital competitiveness and intrabank structural optimization. Quantitative downward movements in a number of banking institutions, documented in the recent years, coincide with present-day world FinTech-trends, displacing the traditional forms and channels of the banking servicing.

In the authors' opinion, it is important to develop the regional banking sector and the regional payment infrastructure, creating the conditions not only to level off the economic development in regions, but allowing to increase availability of innovative financial technologies for all market players and particularly for the agribusiness ones (T.A. Dugina *et al*, 2015).

The Russian economy demonstrates obvious territorial imbalances in the development. Since the second half 2000s in the wide rural territories there has been the tendency when affiliated branches and systematically-important bank offices, partially government owned, stop their business. Sberbank RF, big commercial banks hesitantly expand the network to function in disadvantageous in term of financial operations numbers in rural territories (Z. Kozenko, *et al*, 2017). It is held that in modern conditions it is economically unfeasible to open new or support existing specialized territory-located financial institutions. Innovation-oriented financial institutions transfer from multi-channel to omni-channel interaction. With the view to solve the issue about availability of financial services there has been significantly enlarged the functions of "Russian Post", created profiled Post Bank and digitized the post channels.

Having said that in scale of Russia there is a strong territory specialization and specifics in agribusiness. We assume that the individuals demand, involved in agribusiness, can be fully satisfied by not merely sector-based banks as Russian Agricultural Bank but also the regional banks, who are well aware of the conditions and specificity of conducting agricultural activities in a certain region. Relatively small size of regional banks is not a barrier in their positioning as conductors of payment digital innovations into the economy of a region and particular in agricultural sector. Regional commercial banks act as agents in the national payment Russian system because they are full-fledged infrastructural elements.

Thus, in Volgograd region three regional banks are registered – Joint-stock commercial bank "KOR", commercial bank "Russian Southern Bank" (carries out emission and acquiring of payment cards Visa and Golden Corona), NOKSSBANK (carries out emission and acquiring of payment cards Visa and Master Cards), which provide to their clients in the agricultural Volgograd region the access not merely to the national payment systems but also to the international ones (Hayek, Friedrich August van. 1996), to products and services.

Initiated processes by the Russian Bank on establishing the three-level bank system is to give a boost to bank business optimization in regions and to give them the opportunity to increase the efficacy and sustainability in their development (O.G. Semenyuta, N.O. Panchenko, 2013). Bigger banks should use the preference simplified surveillance system and

the system geared at regulating banking risks, when licensing is confined compared with large-scale loans associations.

On the other hand, a relatively small bank can take excess, even catastrophic, risks and this fact is not in direct relation with a bank size or its proportionality. In our opinion, these measures allow to strengthen the competitive positions of regional banks, which, as a rule, are referred to small-size ones. The exclusively regional criteria is not enough in order to classify banks as banks of a simple operational level because at present all bank products and bank operations, clients' demands are changing dynamically in a view of new financial technologies not merely into the bank sector but into the sector of state and municipal servicing as well.

The prospects of solutions towards the Internet-banking and mobile-banking say about the importance to limit active operations, carried out by a regional bank, but not about the territorial borders. After the global financial crisis in 2008 the controlling in the banking sector has been significantly tightened; technically-complex standards were introduced to minimize risks in complex-to-fulfill financial operations (E. Travkina, S. Kovalenko 2016). However, in our opinion, to introduce tight measures for small size regional banks in the absence of complex banking products and operations is not reasonable. In general, the reforms in the controlling system along the banking system levels will allow to give impetus to the development of regional banks and their payment infrastructure in regions. This will facilitate to level off the territorial development of Russia and their industrial economic branches that are not directly involved into the processes of diffusion towards the financial innovations of the payment market.

IV. CONCLUSION

With the aim to provide to metropolitan agglomerations and rural territories the equal access to the digital payment systems, it is proposed the territorial diversification in the payment systems. To reinforce it, we propose to do:

- to create the networking of high-speed Internet and general IT-infrastructure ready to accept the payment systems. It allows to level off the Russian regions in terms of providing them with the high technological means of communication and information transmission;
- to lead the state-supported policy not only in terms of the payment systems designed in Russia, but also relating to sectoral and other banks providing innovation financial servicing in rural territories;
- to provide the technical attractiveness of the territorial diversification of the digital servicing that are offered by financial organizations due to acceptability of the technical and technological aspects allowing to implement them;
- to ensure the initial stage tax preferences allowing to launch the digital economy principles in the financial sector that services rural territories. The tax preferences can be done in a view of investing tax loans on

purchasing the payment infrastructural equipment, tax remission on all costs spent in fulfilling the priority social tasks;

- to develop systems able to carry out instantaneous bank transmissions, decentralizing bank servicing systems based on the distributed registries and blockchain technologies allowing to abstract from the territorial factors;
- to design diversified mechanisms for pricing formation concluded in ranking the prices on digital payment services offered to clients from rural territories;
- to provide information-outreach policy and state education policy in terms of increasing the level of awareness in digital financial and communication literacy among payment systems and services users. These educational trainings should cover the range of digital technologies involved into the payment servicing business and deal with practical application on how to use these instruments in real life; reveal the approaches on how to protect personal information and provide the security to own finances;

The first four measures concern the state security policy that should be provided by the Government for Russian agribusiness taking place in rural territories; the fifth and sixth measures are linked with the mission and the strategy of financial organizations, providing the digital financial services. The proposed measures of the territorial diversification in payment servicing, in infrastructural development and in the diffusion of the digital payment innovations in agriculture are in line with the state policy aimed at creating the digital society and the common digital eco-system. These measures will facilitate to strengthen the economic state sovereignty and help to level off the development of small cities and rural regions of Russia that will result in increasing their social attractiveness.

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References

- [1] I.D. Anikina, A.V. Gukova, A.A. Golodova, A.A. Chekalkina (2016) Methodological aspects of prioritization of financial tools for stimulation of innovative activities, *European Research Studies Journal*, Volume. 19, no. 2 Special Issue. pp. 100-112.
- [2] M.L. Bech, C. Preisig and K. Soramaki, *Global Trends in Large-Value Payment*, FRBNY Economic Policy Review, 2008.
- [3] D.D. Burkaltseva, O.V. Boychenko, O.S. Sivash, N.M. Mazur, S.A. Zotova, A.V. Novikov, “The Construction of the Digital Organizational, Social and Economic Production Mechanism in the Agro-industry”, *European Research Studies Journal*, vol. XX, 2017, iss. 4B, pp. 350-365.
- [4] D.D. Burkaltseva, O.S. Sivash, O.V. Boychenko, L.V. Savchenko, T.N. Bugaeva, S.A. Zotova, “Realization of Investment Processes in the Agricultural Sector of the Digital Economy”, *European Research Studies Journal*, vol. XX, 2017, iss 4B, pp. 366-379
- [5] T.A. Dugina, E.A. Likholeto, A.V. Nemchenko, A.V. Belyakov, A.A. Likholeto, “Regional aspect of rural sector support”, *Biosciences Biotechnology Research Asia*, vol. 12, no. 1, pp. 549-555.
- [6] F.A. van Hayek, *Private money*. Moscow: The Institute Of National Economy Model, 1996, p. 229.
- [7] Z. Kozenko, N. Ivanova, I. Shmyreva, Y. Kozenko, K. Kozenko, “Marketing instrumentarium of provision of food security”, *Contributions to Economics*, 2017, no. 9783319454610, pp. 183-188.
- [8] Y. Kozenko, Z. Kozenko, A. Bobicheva, K. Kozenko, M. Filin, “Perspectives of development of agriculture in crisis by the example of present-day Russia”, *European Research Studies Journal*, 2016, vol. 19, no. 2 Special Issue, pp. 171-178.
- [9] O.M. Korobeynikova, and D.A. Korobeynikov, “The problems of the transmission of monetary and credit resources in the context of monetary policy” [Problemy transmissii denezhnykh i kreditnykh resursov v kontekste provedeniya denezhno-kreditnoi politiki], *Proceedings of the lower Volga agrodiversity complex: science and higher professional education*, no. 2(38), 2015, pp. 246-251.
- [10] O.M. Korobeynikova, “Development of local payment systems due to the potential of credit cooperation” [Razvitie lokal'nyh platezhnykh sistem za schet potenciala kreditnoy kooperacii], *Proceedings of the lower Volga agrodiversity complex: science and higher professional education*, no. 2(26), 2012, pp. 228-233.
- [11] Yu.I. Korobov, “The development of the banking system: modernisation or transformation?” [Razvitie bankovskoi sistemy: modernizatsiya ili transformatsiya?], *Science and society*, no. 3(22), 2015, pp. 39-41.
- [12] A.V. Nemchenko, T.A. Dugina, E.A. Likholeto, A.V. Malofeev, and A.A. Likholeto, “Conditions for developing sustainable growth of region's agricultural industry”, *International Journal of Economics and Financial Issues*, vol. 6, no. 2, 2016, pp. 207-211.
- [13] O.G. Semenyuta, N.O. Panchenko, “The banking sector of Russia – the basis of modernization of the domestic economy” [Bankovskii sektor Rossii – osnova modernizatsii otechestvennoi ekonomiki], *Finance and credit*, no. 41 (569), 2013, pp. 2-7.
- [14] R.Yu. Skokov, “Vvedenie v teoriyu rynkov «addiktivnykh blag»” [Introduction to the theory of markets of "addictive goods"], *Modern economy: problems and solutions*, vol. 5 (41), 2013, pp. 13–20.
- [15] J.E. Stiglitz and A. Bhattacharya, *Underpinnings for Stable and Equitable Global Financial System*, New-York: World Bank, 1999
- [16] E.V. Travkina, S.B. Kovalenko, “Supervision of Bank of Russia behind activity of commercial banks” [Nadzor Banka Rossii za deyatelnost'yu kommercheskikh bankov], In *Proc. of International scientific-practical conference*. Ufa: Aeterna, 2016, pp. 139-141 [Traditional and innovative science: history, modern condition, prospects, 2016]