

Fintech as a Precondition for Transformations on Global Financial Markets

Sergey Belozyorov

Chief Researcher, Laboratory of Asian Economic Studies; Head, Department of Risk Management and Insurance,
s.belozerov@spbu.ru

Olena Sokolovska

Leading Researcher, Laboratory of Asian Economic Studies, e.sokolovskaya@spbu.ru

St. Petersburg State University, 7–9 Universitetskaya Emb., St. Petersburg 199034, Russian Federation

Young Sik Kim

Professor, Department of International Commerce and Area Studies, yskim@gwnu.ac.kr

Gangneung-Wonju National University, 254571, 7 Jukheon-gil, Gangneung-si, Gangwon-do, Republic of Korea

Abstract

The article considers the opportunities, risks, and challenges associated with the development of digital financial technologies. To identify them, we used the scenario approach. We determined three main development scenarios for the market of innovative financial technologies — “domination of traditional financial companies”, “segmentation of market of new financial technologies”, and “domination of digital financial companies” in terms of their probability and possible consequences for the global financial markets. The results of analysis allowed us to suggest that among main scenarios of fintech development the most probable is the splitting of existing market, which in the future can turn into a market of digital transnational financial corporations, which will squeeze out both small companies and traditional financial giants. However, although the scenario of capturing the financial market by large players is currently unlikely, it is certainly more important in terms of the consequences for global markets.

The main prerequisite for the latter scenario is the promotion of international cooperation in the regulation of digital financial companies. Such a condition requires new models of country-level interaction in the regulation of innovative financial companies in order to address the risks and challenges of different scenarios of fintech development on global financial markets. This article includes a comparative analysis of digital development in Russia and the Republic of Korea, which is one of the key players on the Asian fintech market, as a possible benchmark that can be used to shape the policies of intergovernmental cooperation on global financial markets. These policies include 1) regulatory cooperation that reduces risks due to growing experience in the regulation of innovative financial companies; 2) cooperation in investments that allow one to acquire additional experience in regulatory practices and to develop infrastructure, which meets the new requirements of digital finance; and 3) cooperation in the taxation of fintech companies that reduces cross-border regulatory arbitrage.

Keywords: fintech; digital economy; scenario approach; global financial markets; financial inclusion; international cooperation; regulation; finance; investment; regulation; risks; Russian Federation; Republic of Korea; comparative analysis

Citation: Belozyorov S., Sokolovska O., Kim Y. (2020) Fintech as a Precondition for Transformations on Global Financial Markets. *Foresight and STI Governance*, vol. 14, no 2, pp. 23–35. DOI: 10.17323/2500-2597.2020.2.23.35



© 2020 by the authors. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

With the development of global digital communication technologies, various forms of international cooperation have become exceptionally important. They allow one to efficiently exploit opportunities, bypass limitations, and balance the risks arising from differences between countries, mainly in the legal field. Sharing experience and disseminating more effective practices in the private and public sectors alike contributes to identifying the best tools for regulating the international financial market, taking into account national specifics while ensuring global consensus. Countries' cooperation in the field of financial technology (fintech) is actively discussed by the World Bank and the International Monetary Fund (IMF). At the end of 2018, these organisations proposed the Bali Fintech Agenda which reflects the main objectives of cooperation on relevant markets [IMF, World Bank, 2018]:

- promoting competition;
- extending coverage of the public;
- promoting the development of financial markets;
- monitoring changes in financial systems;
- creating a sustainable financial and information infrastructure to maintain the benefits of using fintech tools;
- promoting international exchanges of information.

Since the main cooperation mechanisms in the field of innovation remain local, national, or regional in nature, most of the relevant studies tend to be of the practical type, focused on preparing economic policy recommendations for national and regional authorities. However, some authors turn to conceptual aspects of such cooperation [Lundquist, Tripp, 2011; OECD, 2013; Makkonen et al., 2017; Meissner et al., 2013] or to specific features of digital economic development in the regional and sectoral contexts (Table 1).

The mass adoption of digital financial tools is due to advances in electronic payment systems, governments' new regulatory policies, and the emergence of next-generation financial services available via mobile devices with internet access, that is, everything collectively referred to as "fintech".

The goal of this study of the current state of the fintech market is identify a potential scenario for its development, assess the results of this scenario's implementation, and evaluate the risks and challenges associated with the proliferation of fintech tools. This will help identify the most promising areas for countries' cooperation to alleviate the

risks of implementing financial technologies on global markets.

Methodology of the Study

The methodology of this study is based on the scenario approach. The tools presented in [van Notten, 2006] were applied to build the scenarios. Adapting this approach in line with the available statistical data and assessments of the factors under consideration allowed us to identify the following scenario development stages: determining the object; describing the development drivers; building a scenario; assessing the likelihood of its implementation; and assessing relevant opportunities and risks.

The object of the study being the development of fintech in global financial markets, the following major drivers were identified:

- the emergence of new (digital) technologies;
- the costs of, and the time required for new companies entering the market;
- the rate of new technologies' and companies' proliferation (cross-border flows and cooperation);
- market "rules of the game";
- companies' operating costs (which depend upon the coverage of the population and small and medium businesses (SMEs) by financial services and the application of cheaper technologies).

The following techniques were used to actually build scenarios:

- trend-based scenario techniques;
- creative-narrative scenario techniques.

Both these approaches belong in the predictive scenarios category (Börjeson et al., 2006) closely related to the probability and credibility concept, since any attempt to predict anything one way or another comes down to assessing, sometimes subjectively, the chances of certain events' taking place. Other classifications do not distinguish predictive scenarios but include them in the explorative scenarios group [Alcamo, 2001; Greeuw et al., 2000; van Notten et al., 2003; Eurofound 2003; Kosow, Gaßner, 2008; etc.].

The trend extrapolation technique involves building the most likely (reference, trend) scenarios (typically just one) to compare them and range on a "low-high" scale. Qualitative trend analysis and "soft data"¹ are used to describe the development paths. Such scenarios are more often called "forecasts" (prognoses) or outlooks rather than "scenarios" proper [Kosow, Gaßner, 2008].

¹ "Soft data" is data which cannot be measured quantitatively.

Also, certain elements of the creative and descriptive approach to scenario building were applied, in particular the assessment on the scales “implementation probability – impact strength”, “low – high probability”, and “significant – insignificant consequences” of the scenario implementation for the development of the system [Kosow, Gaßner, 2008] (Fig. 1).

Depending on the research object, the likelihood/impact balance allows one to range scenarios along the following system of coordinates:

- significant market trends (high probability, high impact);
- shaping the market context (high probability, low impact);
- potential for unexpected problems (low probability, low impact);
- uncertainty factors play a major role (low probability, high impact).

Scenarios in this category are built to assess forecasting potential, implementation probability, key factors affecting the development of the system under consideration, and directions for its development [Alcamo, 2001; Kosow, Gaßner, 2008; Sokolov et al., 2019]. The following predictive scenarios’ features determined the application of this technique in our study:

- suitability for the conceptual assessment and analysis of anticipated challenges, opportunities, and prospects, along with the identification of potential problems subject to certain conditions of the system’s development;
- the opportunity to build scenarios for individual system structures;
- suitability for stable trends, that is, those which can be extrapolated confidently enough.

Let us take a look at the current state and development trends of the global fintech market.

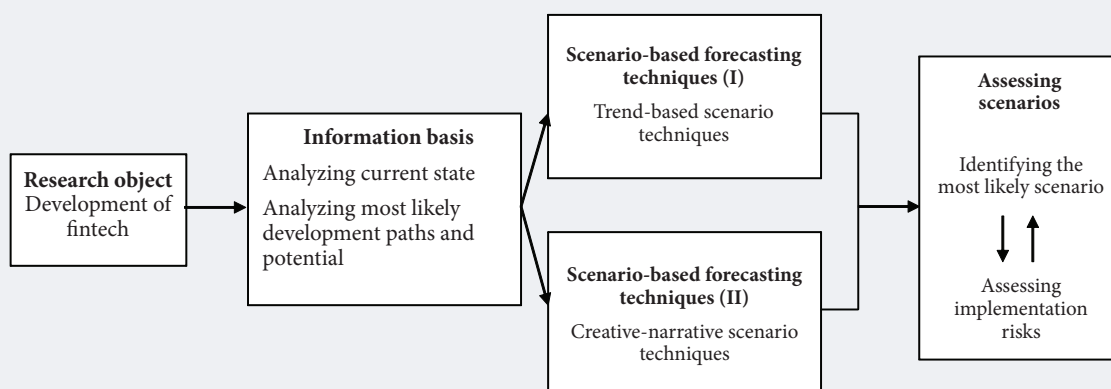
Proliferation of Fintech

Various innovations, including in the service sector, are a major factor of increasing social prosperity, while the state traditionally plays a key role in regulating relevant issues [Meissner et al., 2013; Miles, 2016; Mention, 2019]. Today many countries pursue policies designed to extend the public’s access to financial services (financial inclusion), at the national and international levels alike. Such inclusion (first of all use of electronic transfers and payment cards) can turn into an economic growth driver due to democratization of investment instruments through mobile banking and lower transaction costs, thus leading to increased income [Demirguc-Kunt et al., 2018]. These aspects are especially critical for Russia, where low purchasing power is one of the main obstacles hindering the development of digital financial services. Financial inclusion will not only allow one to optimize individual risk management, but will also contribute to increased savings and the reduction of the shadow economy and corruption due to the transition from cash to electronic payments.

Figure 2 compares fintech coverage and the level of the sector’s development in various countries.

In most high-income countries the difference between these two indicators is not significant. In the regional context, the largest gap is observed in Asian countries, which are the world leaders in terms of rate of development for fintech. Although North America, especially the US, remains the world’s leading player (experts expect the regional market to reach \$80.85 billion by 2023), it is in Asia that the fintech market is expected to achieve

Figure 1. Building and Assessing Scenarios: Flow Chart



Source: compiled by the authors basing on: [Börjeson et al., 2006; Alcamo, 2001; van Notten et al., 2003; Xiang, Clarke, 2003; Jäger et al., 2007; Kosow, Gaßner, 2008; Wodak, Neale, 2015].

Table 1. Studies of International Cooperation in the Field of Digital Economy: Regional and Sectoral Contexts

Context	Research Topic	Literature
Regional	Asian countries	[Zhang, 2018; Yoon, 2019]
	Latin American and Caribbean countries	[Patiño et al., 2018]
	South American and African countries (South-South cooperation)	[Banga, Kozul-Wright, 2018]
	BRICS countries	[Banga, Singh, 2019]
	European countries	[Heimerl, Raza, 2018]
Sectoral	International trade	[Ascencio, 2016]
	Higher education and development of human potential	[Grimm et al., 2018; Lavrinenko, Shmatko, 2019]
	Tax administration and tax information sharing	[Heikura, 2018]

Source: compiled by the authors.

the highest growth rates, at 43.3% in 2018-2023 [Netscribes, 2019]. This will be due to the increased number of start-ups in various segments of the financial market, primarily the banking, insurance, and asset management sectors in countries such as India, China, the Republic of Korea, and Japan. For example, the headquarters of the world's largest fintech company, Ant Financial Services Group (formerly Alipay), with more than 10,000 employees and assets in excess of \$150 billion is located in China. Latin America is gradually becoming one of the most promising regions in terms of fintech

development, mainly due to Mexican and Brazilian efforts [Netscribes, 2019].

Various combinations of the aforementioned drivers allow for building the following scenarios for financial markets' development:

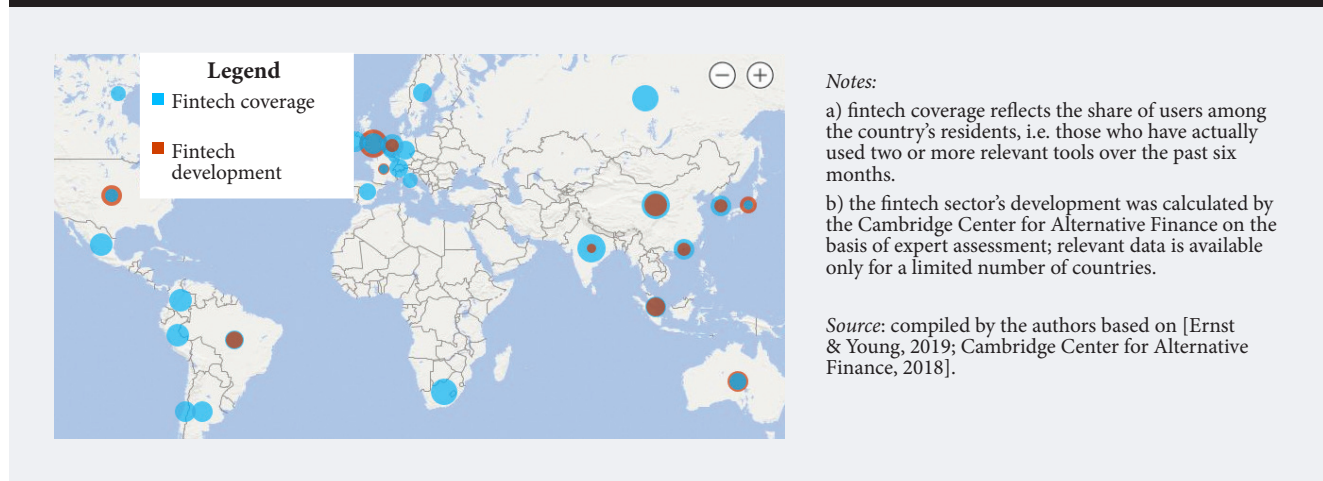
1. Conventional financial companies, primarily banks, insurance companies, and other intermediaries retain market control by accumulating cutting-edge advances of the innovative fintech industry.
2. The market is split into numerous narrow segments and niches that provide financial services focusing on consumers' specific social, psychological, economic, and geographical needs, with the traditional major players maintaining their positions.
3. The rapid growth of multinational digital corporations pushes back the traditional financial market players.

The implementation of these scenarios not only implies certain risks, but opens a number of opportunities, the analysis of which is presented below. Each scenario's content is described as taking into account the following quality criteria: no unfounded (erroneous) assumptions; credibility (reliability); fullness; description of development paths; and a causal relationship [Mietzner, Reger, 2005].

Scenario 1

Traditional financial intermediaries may be able to maintain their strong positions despite the growing pressure from new players due to the combined effect of various factors such as consumers' inertia, excessive regulation of the sector, and complex market mechanisms. Under such circumstances, traditional financial market players will have enough time to develop effective competitive strategies.

Figure 2. Fintech Development Indicators by Country, 2018



Given the rate of and the development forecasts for new fintech tools, the likelihood of this scenario seems to be low. As to its positive aspects, one of them is the absence of (or very small) need for regulatory changes.

Scenario 2

The current trends for and the rate of fintech development give grounds to see this scenario as very likely in the short term. The traditionally high costs of companies' entering the financial services markets are limited by the increased number of new players, while large dominant firms maintain their positions. At the same time, the costs of entering the market and the time new companies need to do so and obtain a foothold there are rapidly decreasing due to the digitalization of technologies and regulatory changes. Accordingly, new start-ups are taking over certain segments and niches, including those previously unclaimed due to high costs and technological limitations.

The key result of this scenario's implementation will be increased coverage of the public and SMEs by financial services. The following measures will help achieve this:

1. Reduced or zero costs of receiving and providing financial services, which is particularly important for residents of remote rural areas and more vulnerable social groups such as women, the poorest segments of the urban population, and migrants.
2. Simplified customer due diligence (CDD) procedures.
3. The diversification of financial services including the development of financial products for low-income groups.
4. Reduced information asymmetry between parties to transactions, which is particularly important for consumers with no previous access to banking services as they lack the information required to adequately assess the risks.

The likelihood of this scenario's implementation can be assessed by analyzing the example of the lending segment and distribution platforms. Online lending, P2P lending², and crowdfunding can increase financial services' coverage by granting loans to people with insufficient (by the "conventional" intermediaries' standards) credit histories, while securing them (loans) using new data sources such as, for example, clients' smartphone applications or online sale and shopping histories.

For SMEs, such platforms provide access to funding even if the former's credit histories are insufficient or their credentials incomplete. These platforms provide specialized services using cloud technologies that reduce small businesses' operational costs. At the preparatory stage of supply chain formation, lending platforms can increase long-term funding, the securing of which on conventional financial markets tends to be problematic for SMEs. For very small or newly created enterprises, donations and crowdfunding can be an important and, frequently, the only source of initial capital.

Distribution platforms, yet another highly specialized market segment that has been actively developing in recent years, may prove useful both for the wholesale distribution of goods (product distribution platforms) and the distribution of financial resources (funds distribution platforms)³. Platforms of this type give investors, financial advisors, or private asset managers access to a wide range of third-party products and services at specialized venues. The application of algorithms can reduce products' or services' costs and increase customers' awareness when they are looking for the best solution. Most of the distribution platforms have emerged in mature economies (primarily in the US), but now they are actively developing on emerging markets too, including on the basis of robo-advising technologies (e.g., in India, the Republic of Korea, Mexico, China, and Brazil, or even in low-income countries such as Kenya).

Muslim countries and regions whose fintech markets are segmented in accordance with so-called Islamic finance principles, stand somewhat apart. According to the Global Findex Database, in 40 out of 56 members of the Organisation of Islamic Cooperation (OIC), the proportion of the population who have accounts with financial institutions (50%) does not exceed the world average [Demirguc-Kunt *et al.*, 2018]. The proliferation of "Islamic" financial services can be an effective tool for increasing the share of the "covered" population. Some fintech instruments match the Islamic finance principles quite well such as the ones designed for asset-backed transactions and risk sharing. IMF research shows that about 70% of all currently operating Islamic fintech companies are focused on supporting businesses and providing funding to clients through equity-based crowdfunding and P2P lending [IMF, 2019].

The use of digital financial tools guarantees the security of sukuk transactions⁴. In 2018, blockchain

² P2P lending is providing loans to persons unrelated to each other through specialized online platforms without involving conventional financial intermediaries such as banks or other credit institutions.

³ Fund distribution platforms act as intermediaries between securities brokers and asset management companies (or individual managers), providing administrative services such as distribution agreements, order routing, and discount calculation.

⁴ Sukuk is a financial instrument popular in Sharia countries, the Islamic equivalent of bonds. A sukuk provides non-guaranteed income from profits generated by the funded activity.

technologies were used for the secondary sale and placement of sukuk in the amount of \$500 million by one of the UAE private banks, due in September 2023. A project that allows retail investors to buy sukuk using blockchain technology has also been launched in Indonesia [IMF, 2019].

Scenario 3

Digital financial companies' advancing to leading positions in regional rankings suggests that the trends described in *Scenario 3* are a natural continuation of those presented in *Scenario 2*. A key factor in this scenario's implementation is stronger international cooperation in regulating the activities of digital financial companies, while the expected result is the emergence of new cross-border financial flow formats due to the development of innovative fintech. These include new capital market transaction tools (among others, for cross-border transactions) such as tokenized securities – a digital analogue of classic stock market shares – and securities purchased using blockchain technologies. Cross-border crowdfunding will also become possible in the near future. All these developments can gradually change the role of conventional centralized intermediaries, transform the nature and characteristics of cross-border capital flows in global financial markets, and, as a result, diversify and decentralize the very model of international finance.

The above analysis allows one to make a qualitative assessment of various scenarios' likelihood. We will distribute them along the proposed coordinate axes: the implementation probability as such and the impact upon financial markets. Of particular interest are the scenarios with potentially serious consequences and different likelihoods (or, alternatively, certainty) of actually taking place.

The current global fintech development trends can be projected into the future in the framework of the suggested scenarios (Figure 3).

Scenario 1. Taking into account the development rate of new fintech tools and relevant forecasts, this scenario's likelihood can be assessed as low.

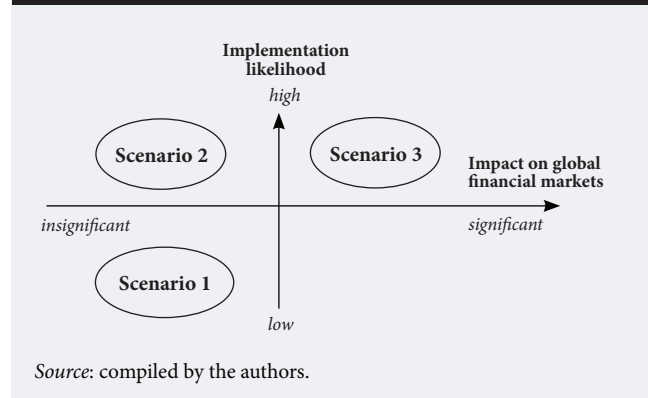
Scenario 2. The current trends and the rate of development of new fintech tools allow one to assess the short-term likelihood of this scenario as very high.

Scenario 3. Given the digital financial companies' advancing to leading positions in regional rankings, this scenario can implement as a result of the gradual transformation from the previous scenario.

Each of these scenarios implies certain risks.

Scenario 1. Fintech coverage grows at a slower rate and overall development of innovative financial tools also slows down.

Figure 3. Possible Fintech Development Scenarios on Global Financial Markets



Scenario 2. Conventional financial intermediaries gradually lose most of their customers because the latter go to companies whose services better meet their needs.

Other risks are associated with the limited scope for the implementation of the scenario, first of all because the infrastructure does not meet the new digital finance requirements such as high transaction speed, deferred interaction, automated decision-making, widespread use of data, reduced use of paper media for storage of transaction and account records, and involvement in transactions of intermediaries and organizations whose activities have not yet been properly regulated. In their turn, these limitations may negatively affect consumers' awareness of new financial opportunities and risks, which is particularly relevant for the most vulnerable social groups and those who have never used such services before.

Another "technical" risk associated with the implementation of this scenario is discrimination against borrowers. Despite the fact that fintech tools do ensure compliance with the impartiality principle for all parties to transactions and guarantee the absence of accounts payable in the amount of controlling interest, automatic algorithms themselves are fraught with errors caused by developers, accidentally or deliberately (e.g. intentional discrimination against minority borrowers when developing a smart contract algorithm). Therefore combining "manual" and automatic decision-making modes seems to be the best approach.

Less-than-perfect consumer protection mechanisms can lead to the disclosure of personal data, breaches of confidentiality, inadequate tools for restoring violated rights, a low level of cybersecurity, and digital illiteracy. The main consequence of all these risks is the theft of personal data, which is the more likely to happen the lower the level of

customers' financial and digital literacy, and the smaller the range of alternative digital products.

A separate group of risks associated with this scenario is related to regulating innovative financial companies, primarily the lack of relevant experience. Regulators represented by national legislative and law enforcement authorities insist on the need to develop international standards for managing and supervising fintech companies' and service providers' activities, since the relevant regulatory practices remain very limited even in "established" market segments such as mobile banking. In other fintech market segments, only a few countries have legally regulated use of crypto-assets and related services, P2P lending, and algorithmic trading. Essentially there are no similar regulatory solutions for areas such as digital insurance technologies (InsurTech), robo-advising, and artificial intelligence-based lending. This is partly due to the lack of resources for developing adequate regulatory measures. The above limitations become critically important when it comes to managing cybersecurity risks, operational risks (including those of third parties), and the theft of borrowers' information (especially legal entities) provided in accordance with information disclosure requirements. Low-income countries are particularly vulnerable in this regard, forced to balance between a threat to financial stability and the prospect of losing the opportunities provided by new fintech tools.

In the context of international economic law, cross-border regulatory arbitrage risk deserves special mention, which allows countries to use differences in specific jurisdictions' regulatory frameworks to their advantage. A key feature of new digital economy business models is that there is no need for the seller or buyer to be physically present in a certain jurisdiction to conduct a transaction, which significantly increases the scope for applying various tax avoidance and tax evasion schemes. Digital fintech tools expand access to hybrid mismatch arrangements applied by hybrid and reverse hybrid companies⁵. In particular, such schemes include double non-taxation, double tax deduction, the deduction of interest expenditures in one country, and the non-inclusion of the corresponding income in the tax base in another country.

Scenario 3. The risks associated with the implementation of this scenario are related to the need

to upgrade capital flow management mechanisms and strengthen macro-prudential measures. P2P transactions are difficult to monitor and limit. The increased number of channels for cross-border capital flows can lead to increased demand for regulatory arbitrage, aggravated adverse consequences of contagious (infectious) risks, loss of liquidity risks, and spillover effects.

A particular problem is the issuing and circulation of digital currencies, which if widely adopted, can change the key factors supporting the reserve currency status: the structure and nature of foreign trade and the financial network effects. Depending upon the new cryptocurrencies' liquidity and the level of confidence in them, they can affect the need for reserves (buffered inventories and/or liquid assets) or promote the emergence of new reserve currencies. In turn, this will affect gold and foreign exchange reserves, the choice of the exchange rate regime, and the size and structure of the global financial safety net (GFSN).

The above challenges and risks lead to the need to strengthen countries' cooperation to achieve a balance between the efficiency and risks associated with the emergence and development of new formats of global financial flows and minimize undesirable conflicts in international transactions. Cooperation between individual countries on the fintech market can improve the interaction between private players and national regulators, for example, it facilitates fintech companies' access to regulatory sandboxes⁶ in other jurisdictions.

Before moving on to a review of the main areas of cooperation between Russia and the Republic of Korea in the financial sphere, let us take a look at the current level of innovative fintech in these two economies.

Russia and the Republic of Korea: the Development of Digital Fintech Tools

Digital Development in Russia and the Republic of Korea

The Republic of Korea has the most efficient startup promotion system in Asia, which allows the country to vigorously compete with China and India. For example, if in 1999 there were 2,000 startups in Korea, by 2018 this number reached 37,000 [Kong, 2016].

⁵ Hybrid companies (also called double-classification companies) are not tax residents (they do not pay corporate income tax in the jurisdiction where they conduct business), but are tax residents and do pay corporate income tax in a foreign jurisdiction. Reverse hybrids (companies with reverse classification), on the contrary, do not pay income tax in foreign jurisdictions but do pay it in the jurisdiction of conducting business. See: <https://www.fatca.hsbc.com>, accessed on 10.05.2020.

⁶ Regulatory sandboxes, or platforms, allow for exploring innovative financial services and technologies by practically testing them or evaluating them in the scope of limited regulatory experiments. Fintech companies, primarily startups, use such sandboxes to test innovative financial tools and services by providing them to consumers in a limited way and under the control of a regulator. The participants can be fully or partially exempted from existing regulatory requirements. Projects implemented in regulatory sandboxes are mainly related to the application of artificial intelligence, biometric technologies, blockchain, cryptocurrencies, and crowdfunding.

Figure 4 presents a comparison of digital financial services' coverage in the Russian Federation and the Republic of Korea, and the overall digital competitiveness of these economies. For benchmarking purposes, the figure also presents aggregated values of relevant indicators for East Asian and Pacific (EAP) countries, which according to the World Bank classification include Korea and for European and Central Asian (ECS) nations includes Russia.

The data presented in Figure 4 shows that digital development indicators in the Republic of Korea, for the public and for overall economy alike, significantly exceed the average values in the region. The gap in the number of fintech users is especially wide. In Russia, the situation is reversed: the Digital Competitiveness Index and the coverage of the population by digital financial services are below the average for the relevant region. However, going back to fintech coverage (see Figure 2 above), as of 2018 its value in Russia was 82% (third place in the world, after India and China), while in Korea it was 64%, with a global average of 65% [Ernst & Young, 2019].

Such a significant gap is explained by the specific features of the calculation methodology: Ernst & Young experts, unlike those at the World Bank, used only observational data for Moscow and St. Petersburg to compile the FinTech Adoption Index. Concentration in large cities is one of the main features of the fintech sector's development in Russia (unlike in the US and the EU), along with insufficient regulation of many of its segments (e.g. P2P lending, collective investments, and cryptocurrency operations). At the same time, Russia remains one of the largest suppliers of IT professionals to the global fintech market: Russian programmers emigrate in search of higher salaries [Deloitte, 2018].

The regulation issue is relevant for the Republic of Korea too, but in a different way: strict regulatory requirements for the banking sector are hindering its digitalization and the growth of the domestic fintech market is primarily due to services provided by the non-banking sector. Another important feature of South Korean fintech is the key role of the government which was the main proponent of this sector's development in the country [Ihn, 2018]. The proximity to North Korea negatively affects cybersecurity for cryptocurrency operations: a significant proportion of transactions suffer from theft. According to FireEye, a US cybersecurity company, peaks of hacker attacks originating in North Korea have been noted since April 2017. Experts believe that the US economic sanctions against this country were the reason for the increased number of cryptocurrency crimes [The Economist, 2017].

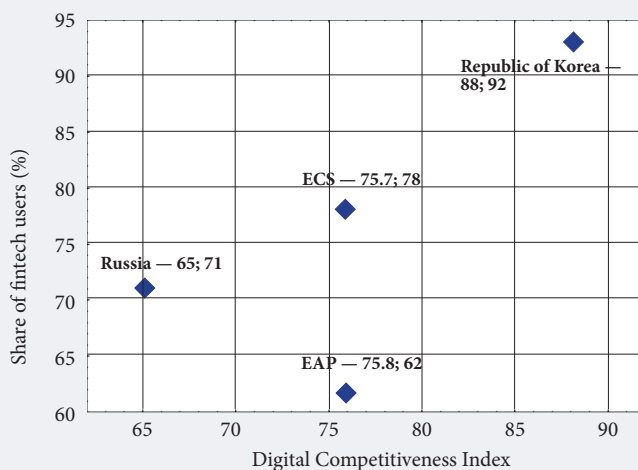
The Fintech Ecosystems in Russia and the Republic of Korea: Investment and Regulatory Aspects

The development of fintech and the rate of creation of relevant innovative products and services depend upon the formation and efficient functioning of the appropriate ecosystem comprising a set of interrelated factors such as access to funding, regulation, technology, demand, and human capital, which are developing in parallel (see, e.g., [Nicoletti, 2018]). Let us consider two elements of the fintech ecosystem which are of critical importance for both Russia and the Republic of Korea: investments and regulation.

I. Access to Funding

According to CB Insights, about \$75 million were invested in the Russian fintech market in 2011-2016. Approximately 90% of that sum came from

Figure 4. Digital Development in the Russian Federation and the Republic of Korea Compared with Relevant Regional Indicator Values



Notes:

- a) The share of fintech users: the share of people aged 15+ who made or received digital payments using mobile banking, debit or credit cards, or mobile phones, or paid for purchases and bills online over the previous 12 months.
- b) The Digital Competitiveness Index reflects the country's position in the digital environment; it is calculated by the International Institute for Management Development (IMD) based on 50 ranked criteria divided into three groups of factors: knowledge, technology, and readiness for digital transformation.

Source: compiled by the authors based on [IMD, 2018; Demircuc-Kunt et al., 2018].

leading Russian banks actively applying innovations in their business processes, both those developed in-house and those obtained from promising start-ups they supported.⁷

In the Republic of Korea, fintech companies are mainly funded by large corporations. For example, investments in local start-ups by giants such as Samsung and Naver are estimated at \$500-600 million a year.⁸

Table 2 presents the main fintech investment promotion areas in Russia and South Korea.

An alternative way of financing the fintech sector in the Republic of Korea is through equity crowdfunding. Apart from start-ups, so-called social enterprises also can get additional capital this way (companies licensed by the Ministry of Employment and Labor, whose activities are aimed at improving financial and social welfare and the environmental situation through commercial initiatives such as providing employment for disabled people, contributing to urban development, etc.).

Debt financing in the form of P2P loans remains one of the most popular funding sources, with a constantly improving regulatory system (P2P Loan Guidelines). A new version of P2P Loan Guidelines has been in force since January 2019, setting borrowing limits between 10 and 40 million Korean won a year depending on the borrower’s income. Investments in mortgage loans through P2P loans (e.g. project funding) are limited to 20 million won. No such limits are set for corporate or accredited individual investors.

The Korean government provides special incentives, mainly in the form of tax preferences. Small and medium fintech companies located outside densely populated cities can get a 50% discount on corporate income tax for up to five years. Companies with venture capital firm status (which make up a significant proportion of fintech market players) can also claim this benefit; no location requirements apply to them. Plus, there are benefits for conducting R&D: tax deductions for certain types of costs including labor and material ones [Financial Stability Board, 2019; Lee, Yim, 2019; Lee, Kim, 2016; Yi, 2019]. Finally, since mid-2019, a 10% VAT rate applies to global corporations providing digital services in the country.

II. Regulation

In the current situation, the fintech market regulator’s main objective is to create a legal environment that would promote innovation while at the same

Table 2. Promotion of Investments in the Fintech Sector in Russia and the Republic of Korea

Russia	Republic of Korea
Various investment promotion mechanisms	Equity crowdfunding P2P loans
Initiatives to support Russian fintech start-ups and promote investments	A system of benefits, including: <ul style="list-style-type: none"> • Tax benefits for SMEs • Capital tax benefits • Tax deductions for investments in R&D
Increasing the public’s financial literacy	
<i>Source:</i> composed by the authors based on [Financial Stability Board, 2019; Lee, Yim, 2019; Lee, Kim, 2015], and the National Programme “Digital Economy in the Russian Federation” (see: https://data-economy.ru/ , accessed on 17.02.2020).	

time effectively monitoring and minimizing the risks on the market.

Table 3 summarizes the main responsibilities of fintech market regulators in Russia and in the Republic of Korea.

Major efforts of Russian and South Korean regulators are focused on creating regulatory sandboxes. In Russia such a platform was launched in April 2018, and in August, Sberbank already started using it for a pilot project: a service for credit organizations that allows them to integrate a platform for managing corporate clients’ accounts remotely with the authority to conduct transactions on their behalf in bank branches. The objective is to reduce the costs of banking services users. To date, more than 30 applications to take part in the regulatory platform have been submitted, mainly by credit organizations and technology companies. More important subject areas include distributed ledger technology (DLT), big data and machine learning, digital profiles (user identification and collecting data on individuals and legal entities from government databases). Projects related to the use and development of cryptocurrencies are not supported by the Bank of Russia due to the lack of regulatory requirements and principles for regulating these operations.

In the Republic of Korea, a regulatory sandbox was created in April 2019 and already in May the Financial Services Commission⁹ approved 18 projects proposed by South Korean fintech companies. Since January 2019, a total of 105 applications have been submitted, 19 of which were given priority. Content-wise, the accepted projects are aimed at providing financial services using advanced technology platforms and mechanisms including

⁷ See https://investinrussia.com/data/files/sectors/0_EY-focus-on-fintech-russian-market.pdf, accessed on 14.03.2020.

⁸ See <https://seoulz.com/korean-startup-ecosystem-and-blockchain-in-korea/>, accessed on 14.03.2020.

⁹ The Republic of Korea’s central government body responsible for financial policy, supervision and control in this area.

¹⁰ See https://www.fsc.go.kr/eng/new_policy/fintechpolicy.jsp for more, accessed on 15.08.2019.

Table 3. Fintech Market Regulators in Russia and the Republic of Korea and their Main Responsibilities

Country (regulatory authority)	Responsibility
Russia (Central Bank)	<ul style="list-style-type: none"> • Designing a mechanism for cross-regulating and coordinating activities aimed at developing fintech in Russia • Developing an electronic information exchange and document management system for financial market participants • Creating a “regulatory sandbox” • Extending international cooperation in the framework of various integration associations to promote the development of the fintech market
Republic of Korea (Financial Services Commission)	<ul style="list-style-type: none"> • Creating a “regulatory sandbox” • Reforming the financial regulation system by reviewing its formal and informal mechanisms hindering the development of fintech • Eliminating regulatory restrictions for financial companies’ investments in fintech • Identifying and structuring business activities in which financial companies are allowed to invest • Taking part in the development and implementation of national technology initiatives

Source: composed by the authors based on [Deloitte, 2018; Mittal, 2019; Choi M., Choi H.-L., 2016], and data published by the Financial Services Commission of the Republic of Korea (see https://www.fsc.go.kr/eng/new_policy/fintechpolicy.jsp, accessed on 15.08.2019).

blockchain technology.¹⁰ According to experts, the main challenges the South Korean fintech sector faces have to do with regulation. In the scope of the Innovation Platforms Program, the government is implementing a reform aimed at deregulating technological development [Kim, Choi, 2019].

Conclusion

The current situation can be described as the emergence of Fintech 4.0 (similar to Industry 4.0), with start-ups and technology companies providing services to economic agents (individuals and companies alike) directly, bypassing the conventional financial intermediaries. Of course, digital technology *per se* does not facilitate access to financial services. This requires having in place an advanced payment system and physical infrastructure, an efficient regulatory framework, and an effective consumer protection system. The reduced costs of providing financial services should lead to their increased availability.

Our analysis shows that the most likely of the main fintech development scenarios involves the fragmentation of the existing market into numerous narrow segments and niches, which potentially can evolve into a market for multinational digital financial corporations capable of pushing back small firms and established conventional giants alike. At the same time, the scenario where major players conquer the financial market, despite being less likely to implement, might make a more significant impact upon the global markets.

Increased coverage of the public by digital fintech instruments will be a key result of certain scenarios’ implementation, identified on the basis of analyzing the current trends of the sector’s development. Adequately meeting the challenges and risks associated with various fintech evolution paths on

global markets requires new models of countries’ interactions in regulating digital financial companies. Over the course of the analysis, the example of Russian-Korean relations was used to assess the areas of international cooperation in the field of finance at the current stage of market segmentation and the global digital transformation.

The first such area concerns sharing experience and best practices in setting up a regulatory sandbox mechanism. Relevant efforts will reduce regulatory risks by accumulating experience in creating and maintaining favorable conditions for innovative financial companies as well as the provision of financial products and services. The Russian experience of promoting the development of fintech instruments in the banking sector (which is going through a stage of profound deregulation in present-day Korea) seems to be relevant here.

Another area of bilateral cooperation which will contribute to accumulation of regulatory experience and promote the development of infrastructure meeting the new digital finance requirements, is international investment projects. Innovative fintech tools are one of the most popular investment areas. Of particular importance for Russia and the Republic of Korea in this regard is the successful completion of 2018 projects: the Agreement on Investment Protection and Trade in Services (regarding mutual investments in fintech and innovative insurance products), and cooperation in the framework of the Global Infrastructure Fund which includes plans for approximately \$100 million of Korean investments in Russia to develop digital infrastructure in the Far Eastern regions.

The digital transformation of international financial markets makes countries’ cooperation regarding the taxation of fintech companies extremely important, since it allows them to significantly reduce the risks of regulatory arbitration. Partnership

in the taxation sphere first of all concerns the implementation of the so-called “BEPS plan”¹¹ which defines a set of major changes in bilateral agreements to avoid double taxation and adapt tax regimes to new business models for the digital economy. The accumulated experience of Russian and Korean cooperation indicates the need to amend the current Convention “On Avoiding Double Taxation of Income” regarding the definition of the permanent representation concept. This would allow one to officially recognize the significant scale of businesses’ presence in two jurisdictions in the context of the digital economy (where most fintech companies belong), and identify double and reverse classification companies. This, in turn, would allow for clearly identifying payments received by Russian and South Korean non-resident investors and counter hybrid cross-border schemes.

Generally, there are obvious gaps in the international regulation of the financial sphere, which provide incentives for using the legal asymmetries and loopholes to the advantage of one of the parties. This situation in itself presents a serious challenge that can undermine international economic cooperation and the sustainable development of global financial markets. Harmonizing individual countries’ legislation on digital development will help them adopt uniform rules of the game for all and promote the rapid dissemination of innovative fintech tools on a global scale.

This study was carried out with the financial support of the Russian Foundation for Basic Research in the framework of the research project No. 20-010-00785 “Digital financial technologies as a factor in the development of the insurance market in the Russian Federation”.

References

- Alcamo J. (2001) *Scenarios as tools for international environmental assessments. Experts’ corner report*, Copenhagen: European Environment Agency.
- Ascencio L. (ed.) (2017) *Trade and Competition in the Era of the Digital Economy. Economic and Technical Cooperation. Report for the VII Annual Meeting of the Working Group on Trade and Competition of Latin American and the Caribbean (WGTC), San Salvador, El Salvador, 12–13 October 2017 (SP/VIIRAGTCCALC/DT 2-17)*, San Salvador: Sistema Económico Latinoamericano y del Caribe. Available at: <http://www.sela.org/media/3205125/vii-ragtccalc-if-n-1-17-ingles.pdf>, accessed 27.02.2020.
- Banga R., Kozul-Wright R. (2018) *South-South Digital Cooperation for Industrialization: A Regional Integration Agenda (UNCTAD/GDS/ECIDC/2018/1)*, Geneva: UNCTAD.
- Banga R., Singh P.J. (2019) *BRICS Digital Cooperation for Industrialization (Working Paper 4/2019)*, Geneva: UNCTAD, University of Johannesburg.
- Börjeson L., Höjra M., Dreborg K.-H., Ekvall T., Finnveden G. (2006) Scenario types and techniques: Towards a user’s guide. *Futures*, vol. 38, no 7, pp. 723–739.
- Burton N., Bach N., Calvin P., Meissner D., Sarpong D. (2019) Understanding cross border innovation activities: The linkages between innovation modes, product architecture and firm boundaries. *Journal of Business Research* (online, in press). Available at: <https://doi.org/10.1016/j.jbusres.2019.05.025>, accessed on 27.03.2020.
- Cambridge Center for Alternative Finance (2018) *Future of Finance is Emerging: New Hubs, New Landscapes. Global Fintech Hub Report*, Cambridge (UK): University of Cambridge.
- Choi M., Choi H.-L. (2016) Building a National System of Technology Foresight in Korea. *Deploying Foresight for Policy and Strategy Makers: Creating Opportunities Through Public Policies and Corporate Strategies in Science, Technology and Innovation* (eds. L. Gokhberg, D. Meissner, A. Sokolov), Heidelberg, New York, Dordrecht, London: Springer, pp. 227–244.
- Deloitte (2018) *Private FinTech as a Tool for Sustainable Business Development in Russia and Kazakhstan. FinTech Market Trends*, Moscow: Deloitte CIS Research Center.
- Demirguc-Kunt A., Klapper L., Singer D., Ansar S., Hess J.R. (2018) *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*, Washington, D.C.: World Bank Group.
- Ernst & Young (2019) *Global FinTech Adoption Index 2019* (ed. G. Hwa), London: Ernst & Young.
- Eurofound (2003) *Handbook of Knowledge Society Foresight*, Dublin (Ireland): European Foundation for the Improvement of Living and Working Conditions. Available at: <http://www.eurofound.eu.int>, accessed 25.01.2020.
- Financial Stability Board (2019) *FinTech and market structure in financial services: Market developments and potential financial stability implications*, Basel (Switzerland): Financial Stability Board. Available at: <https://www.fsb.org/wp-content/uploads/P140219.pdf>, accessed 27.03.2020.

¹¹ The full name is Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting. The signatories are the OECD and the G20 countries.

- Greeuw S., van Asselt M., Grosskurth J., Storms C., Rijkens-Klomp N., Rothman D., Rotmans J. (2000) *Cloudy Crystal Balls: An Assessment of Recent European and Global Scenario Studies and Models*, Copenhagen: European Environment Agency.
- Grimm S., Hörig M., Wolf T. (2018) *Digital Transformation: Higher Education and Research for Sustainable Development*, Bonn: DAAD, DIE.
- Heikura M. (2018) Digital transformation challenges and possible solutions through international cooperation. *Impact of Digitalisation on the Transformation of Tax Administrations* (eds. M.S. Pinta, A. Kővágó, M. Crawford), Budapest: Intra-European Organisation of Tax Administrations (IOTA), pp. 10–13.
- Heimerl V., Raza W. (2018) *Digitalization and development cooperation: An assessment of the debate and its implications for policy*, Vienna: Austrian Foundation for Development Research (ÖFSE).
- Ihn J. (2018) *The Future of Fintech in South Korea*. Available at: <https://medium.com/qara/the-future-of-fintech-in-south-korea-37a0a1315742>, accessed 15.08.2019.
- IMD (2018) *IMD World Digital Competitiveness Ranking 2018* (eds. A. Bris, C. Cabolis), Lausanne: IMD World Competitiveness Center.
- IMF, World Bank (2018) *The Bali FinTech Agenda*, Washington, D.C.: International Monetary Fund (IMF), World Bank Group.
- IMF (2019) *Fintech: The Experience So Far* (IMF Policy Paper, June 2019), Washington, D.C.: International Monetary Fund. Available at: <https://www.imf.org/~media/Files/Publications/PP/2019/PPEA2019024.ashx>, accessed on 15.04.2020.
- Jäger J., Rothman D., Anastasi C., Kartha S., van Notten P. (2007) *Scenario development and analysis. Module 6. A training manual on integrated environmental assessment and reporting*, Nairobi (Kenya): UNEP.
- Kim S.S., Choi Y.S. (2019) The Innovative Platform Programme in South Korea: Economic Policies in Innovation-Driven Growth. *Foresight and STI Governance*, vol. 13, no 3, pp. 13–22. DOI: 10.17323/2500-2597.2019.3.13.22
- Kong A. (2016) *The State of FinTech in South Korea*. Available at: <https://yostartups.com/the-state-of-fintech-in-south-korea/>, accessed 15.08.2019.
- Kosow H., Gaßner R. (2008) *Methods of Future and Scenario Analysis. Overview, Assessment, and Selection Criteria*, Bonn: Deutsches Institut für Entwicklungspolitik.
- Lavrinenko A., Shmatko N. (2019) Twenty-First Century Skills in Finance: Prospects for a Profound Job Transformation. *Foresight and STI Governance*, vol. 13, no 2, pp. 42–51. DOI: 10.17323/2500-2597.2019.2.42.51.
- Lee J.M., Yim S. (2019) *Korea: FinTech 2019. FinTech Laws and Regulation. The International Comparative Legal Guides (ICLG)*. Available at: <https://iclg.com/practice-areas/fintech-laws-and-regulations/korea>, accessed 15.08.2019.
- Lee T.-H., Kim H.-W. (2015) An Exploratory Study on Fintech Industry in Korea: Crowdfunding Case. *Open Journal of Applied Sciences*, vol. 6, no 11, pp. 771–782.
- Lundquist K., Trippel M. (2011) Distance, Proximity and Types of Cross-Border Innovation Systems: A Conceptual Analysis. *Regional Studies*, vol. 47, no 3, pp. 450–460. DOI: 10.1080/00343404.2011.560933
- Makkonen T., Widenfeld A., Williams A. (2017) Cross-Border Regional Innovation System Integration: An Analytical Framework. *Tijdschrift voor Economische en Sociale Geografie*, vol. 108, pp. 805–820. DOI: 10.1111/tesg.12223.
- Meissner D., Roud V., Cervantes M. (2013) Innovation Policy or Policy for Innovation? *Search of the Optimal Solution for Policy Approach and Organization* (eds. D. Meissner, L. Gokhberg, A. Sokolov), Heidelberg, New York, Dordrecht, London: Springer, pp. 247–255.
- Mention A.-L. (2019) The Future of Fintech. *Research-Technology Management*, vol. 62, no 4, pp. 59–63. DOI: 10.1080/08956308.2019.1613123.
- Mietzner D., Reger G. (2005) Advantages and disadvantages of scenario approaches for strategic foresight. *International Journal Technology Intelligence and Planning*, vol. 1, no 2, pp. 220–239.
- Miles I. (2016) The Future of Services. *Deploying Foresight for Policy and Strategy Makers: Creating Opportunities Through Public Policies and Corporate Strategies in Science, Technology and Innovation* (eds. L. Gokhberg, D. Meissner, A. Sokolov), Heidelberg, New York, Dordrecht, London: Springer, pp. 227–244.
- Mittal V. (2019) *South Korea FinTech Landscape*. Available at: https://www.researchgate.net/publication/330701592_South_Korea_FinTech_Landscape, accessed 15.08.2019.
- Netscribes (2019) *Global Fintech Market (2018–2023)*, Mumbai (India): Netscribes Pvt Ltd. Available at: <https://www.marketresearchhub.com/report/global-fintech-market-2018-2023-report.html>, accessed 14.03.2020.
- Nicoletti B. (2017) *The Future of FinTech. Integrating Finance and Technology in Financial Services*, London: Palgrave Macmillan.
- OECD (2013) *Regions and Innovation: Collaborating across Borders*, Paris: OECD. Available at: <http://dx.doi.org/10.1787/9789264205307-en>, accessed 15.08.2019.
- Patiño J.A., Roja E.F., Agudelo M. (2018) *Regional digital market. Strategic aspects*, Santiago (Chile): Economic Commission for Latin America and the Caribbean.

- Sokolov A., Veselitskaya N., Carabias V., Yildirim O. (2019) Scenario-based identification of key factors for smart cities development policies. *Technological Forecasting and Social Change*, vol. 148, art. 119729. Available at: <https://doi.org/10.1016/j.techfore.2019.119729>, accessed 14.03.2020.
- Sparrow O. (2000) Making use of scenarios — From the vague to the concrete. *Scenario & Strategy Planning*, vol. 2, no 5, pp. 18–21.
- The Economist (2017) *Fintech strategies diverge over crypto-currency regulation*. Available at: <http://country.eiu.com/article.aspx?articleid=1545990738&Country=South%20Korea&topic=Economy&oid=1306119914&aid=1>, accessed on 15.08.2019.
- van Notten Ph. (2006) Scenario development: A typology of approaches. *Think Scenarios, Rethink Education*, Paris: OECD, pp. 69–84.
- van Notten Ph., Rotmans J., van Asselt M., Rothman D. (2003) An updated scenario typology: An attempt at synthesis. *Futures*, vol. 35, pp. 423–443.
- Wodak J., Neale T. (2015) A critical review of the application of environmental scenario exercises. *Futures*, vol. 73, pp. 176–186.
- Xiang W.-N., Clarke K.C. (2003) The Use of Scenarios in Land-Use. *Environment and Planning B: Urban Analytics and City Science*, vol. 30, no 6, pp. 885–909. Available at: <https://doi.org/10.1068%2Fb2945>, accessed 15.08.2019.
- Yi H. (2017) *SME Financing & Fintech in Korea*, Busan, Korea: Korea Technology Finance Corporation.
- Yoon D. (2019) R&D Innovation Strategy for International Cooperation of Science and Technology in Asia. *Dynamic Perspectives on Globalization and Sustainable Business in Asia* (ed. P. Ordoñez de Pablos), Hershey, PA: IGI Global, pp. 1–11. DOI: 10.4018/978-1-5225-7095-0.
- Zhang M. (2018) *China's Digitalization and its Implications for China-South Korea Economic Cooperation* (KIEP Research Paper 18–31), Korea Institute for International Economic Policy (KIEP). Available at: <http://dx.doi.org/10.2139/ssrn.3299410>, accessed 15.08.2019.