IRSTI 06.73.02 https://doi.org/10.26577/be.2021.v138.i4.04

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NEW FINANCIAL TECHNOLOGIES: NEW OPPORTUNITIES AND NEW CHALLENGES OF THE XXI CENTURY

Financial technology, or "Fintech", is a sphere comprising from firms which are related to technology, and work in order to create a competitive environment for existing financial companies, and to create new services in the markets.

Fintech is created in order to offer new convenient solutions in the financial environment. On the one hand, these innovations work and bring high profits to the creators. Fintech provides an opportunity for renewed activity in underdeveloped markets that are less attractive to investors, especially in today's environment (for example, money transfers).

On the other hand, such a drive motivates to create innovations in the financial markets. Organizations built on these models are now at the forefront of the modern technologies in finance. The actual reason of this article is to find and show the nature of the modern concept, trends, and challenges for new financial technologies in Kazakhstan and abroad.

The article discusses the financial technologies concepts and their impact on to the economy; analyzes the main indicators of financial technology development in Kazakhstan mostly in the banking sector. The article explores the theoretical and methodological foundations of modern Fintech process based on the analysis of relevant works in this field of study. Issues of modern references, magazines, and Internet resources were used for the research.

The theoretical and practical significance of this work determines a wider range of disclosure of the basic conceptual apparatus and the search for modern ways to use the results in the activities of various institutions for the development of measures to improve them.

Key words: financial technologies, digital technologies, mobile wallets, P2P.

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Жаңа қаржылық технологиялар: XXI ғасырдың жаңа мүмкіндіктері мен жаңа сын-қатері

Қаржылық технологиялар немесе «Финтех» – бұл қаржылық қызметтер нарығында банктер мен делдалдар ұсынатын классикалық экономикалық ұйымдармен бәсекелестік жасау үшін технологиялар мен инновацияларды құратын немесе/және қолданатын фирмалардан тұратын сала.

Финтех қаржы ортасында жаңа ыңғайлы шешімдерді ұсыну үшін құрылған. Бір жағынан, бұл инновациялар жұмыс істейді және жасаушыларға жоғары пайда әкеледі. Финтех инвесторлар үшін әсіресе қазіргі жағдайда (мысалы, ақша аударымдары) онша тартымды емес дамымаған нарықтарда қызметті қайта бастауға мүмкіндік береді.

Екінші жағынан, мұндай драйв қаржы нарықтарында инновацияларды құруға ынталандырады. Осы модельдерге негізделген ұйымдар бүгінде ең жаңа технологиялардың алдыңғы қатарында. Осы мақаланың мақсаты жаңа тұжырымдаманың мәнін ашу және Қазақстанда және шет елдерде жаңа қаржылық технологиялардың алдында тұрған жаңа үрдістер мен сын-тегеуріндерді анықтау болып табылады.

Мақалада қаржылық технологиялар ұғымдары және олардың экономиканың дамуына әсері қарастырылады, банктік сектор мысалында Қазақстандағы қаржылық технологиялардың даму көрсеткіштері талданады. Мақалада осы зерттеу саласындағы тиісті жұмыстарды талдау негізінде Финтех процесінің теориялық және әдіснамалық негіздері зерттеледі. Жұмыста қазіргі әдебиеттің мерзімді басылымдары, журналдар мен интернет-ресурстар пайдаланылды.

Жұмыстың теориялық және практикалық маңыздылығы концептуалды аппаратты және зерттеу барысында алынған нәтижелерді әртүрлі мекемелердің қызметінде олардың қызметін жақсарту шараларын әзірлеу үшін пайдалану мүмкіндігін кеңінен ашудан тұрады.

Түйін сөздер: қаржылық технологиялар, жаңа сын-қатері, сандық технологиялар, мобильді әмияндар, P2P.

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Новые финансовые технологии: новые возможности и новые вызовы XXI века

Финансовые технологии, или «Финтех», – это отрасль, состоящая из фирм, которые создают или/и используют технологии и инновации для конкуренции с классическими экономическими организациями, представленными банками и посредниками на рынке финансовых услуг.

Финтех создан для того, чтобы предлагать новые удобные решения в финансовой среде. С одной стороны, эти инновации работают и приносят создателям высокую прибыль. Финтех предоставляет возможность для возобновления деятельности на слаборазвитых рынках, которые менее привлекательны для инвесторов, особенно в современных условиях (например, денежные переводы).

С другой стороны, такой драйв мотивирует к созданию инноваций на финансовых рынках. Организации, построенные на этих моделях, сегодня находятся на переднем крае новейших технологий. Целью данной статьи является раскрытие сущности новой концепции и выявление новых тенденций и вызовов, стоящих перед новыми финансовыми технологиями в Казахстане и зарубежных странах.

В статье рассматриваются понятия финансовых технологий и их влияние на развитие экономики, анализируются показатели развития финансовых технологий в Казахстане на примере банковского сектора. В статье исследуются теоретико-методологические основы Финтех-процесса на основе анализа соответствующих работ в данной области исследований. В работе использовались периодические издания современной научной литературы, журналы и интернет-ресурсы.

Теоретическая и практическая значимость работы заключается в более широком раскрытии понятийного аппарата и возможности использования результатов, полученных в ходе исследований, в деятельности различных учреждений для разработки мероприятий по совершенствованию их деятельности.

Ключевые слова: финансовые технологии, новые вызовы, цифровые технологии, мобильные кошельки, P2P.

Introduction

Currently, the main task for the state is to develop an economy that will be able to generate innovations and sustainable growth. Last decade our economy has been significantly influenced by technological revolution, including the introduction of new financial technologies on the financial market.

Recently the President Kassym-Jomart Tokayev in his Message (State, 2019) to the citizens of our state identified the main factors of global progress among them “The knowledge Economy”, increasing of productivity, innovations, introduction of artificial intelligence. This shows that in coming years ensuring the full evolution of marketplace and specific strong mechanisms with a stabilizing activity of the state becomes a top priority. So it is necessary to be able to assess rapidly changing environmental conditions in order to find ways to develop with minimal costs. In these circumstances, it is very important for the companies’ owners and top managers to understand the importance of introducing new financial technologies and the influence of digitalization of the economy.

In work of Boyko et al., (Boyko et al., 2017) The definition of the digital economy is presented as a set of certain types of activities based on digital technologies, and a specific infrastructure for their functioning. Urmantseva (2017) also understands digital technologies as technologies that are inextricably linked to the creation, collection, processing, storage and transmission of information based on special digital systems and notes that within these economic conditions, the business model and the value-added model are undergoing a

transformation, while increasing the importance of an individual approach to product formation.

In the foreign literature, the authors found Ziegler's definition of the digital economy as a worldwide network of economic activity, commercial transactions and professional interactions that are provided by information and communication technologies (ICT) (Ziegler, 2017).

According to Arenkov (2018), digital transformation sets the conditions for creating changes in management. In these conditions, directors (or managers) face new challenges, and in general, all this affects the business environment. For example, Top management takes on special functions that are related to the management of Information technology. But, it should be noted that in the digital economy, data is transferred to the assets of the organization, and in some cases it is the only asset (for example, Uber). All this expands the powers and responsibilities that the management process covers. Gadasina et al. (2017) noted that in this example, it is very important to combine the work of companies and IT management. The process of digitalization has not bypassed the financial services market. At the present time has been actively developed new financial technologies as an element of digitalization.

New financial technologies are currently transforming the form in which existing financial products and services are offered to customers. We should not underestimate the ability of traditional market participants to assimilate innovative ideas, but we are seeing a truly revolutionary transformation in the financial sector. At the same time, such transformations will be most active in the near future in the consumer banking and payments sectors (where revolutionary changes are already being observed), followed by insurance and asset management.

As noted in global foreign studies (Global fintech, 2016), FinTech is an actively developing sector in the field of finance and information technology, where startups and market participants create innovative approaches.

Effective financial policy under the influence of modern trends plays a significant role in shaping the prerequisites for ensuring the effectiveness of management. In our case, the digitalization of the economy with new financial technology.

Using digital technologies such as artificial intelligence, blockchain and big data analytics, FinTech start-ups develop, test and deliver a wide range of innovative financial services like digital payment solutions, securing them new opportunities and disrupting the course of traditional banking (Lee and Shin, 2018). However, FinTech start-ups face barriers to development due to the high cost of compliance and a lack of regulatory knowledge (Arner et al., 2015; Haddad and Hornuf, 2018; IOSCO, 2017; UNSGSA et al., 2019), potentially leading to firm failure and disruption in financial markets (Pai, 2017).

The authors of this article assess new types of financial technologies, give their conceptual framework and reflect the spread of technologies in the financial sector abroad and in the Republic of Kazakhstan. In addition, the authors offer some strategic solutions as a response to this constantly changing environment.

In addition, the relevance of this study is due to the following important gaps in previous systematic reviews of the literature:

1) none of the studies was devoted to identifying an indicator of the effectiveness of the use of fintech tools in Central Asian countries;

2) none of the studies has comparative analysis to identify a leading player in this field in Central Asia.

This study attempts to fill in these gaps. The object of the research is the development of new financial technologies. This paper aims to elaborate comparative review is to study the scientific foundations of the need for a new direction-Fintech, focused on the accelerated and effective development of business processes, to identify new Fintech trends in the Republic of Kazakhstan and a comparative analysis of their effectiveness, as well as to reflect the level of support from the state. The objectives of the comparative review are:

1) identify and compare trends in the development of scientific areas of modern fintech tools;

2) identify and compare the effectiveness of Fintech implementation based on the Global Innovation Index of Central Asian Countries;

3) identify the distinctive features inherent in Fintech in the Republic of Kazakhstan, focused on the development of business processes in the financial sector.

Methodology

The methodological basis of the research is the fundamental research of foreign and Kazakh authors in the field of digital economy, digitalization of the banking sphere and financial innovations development. The governmental Program "Digital Kazakhstan-2020", as well as reports of the Government and International data

in the field of realization of creation of modern financial technologies, the experience of Western Europe in implementing digital economy programs. The article also discusses the wide expansion of the FinTech market in the national economy. The analysis tool is statistical research of the financial market. The central result is the determination of the modern global trends in the financial technologies development. The next stage of the study examines the main directions of financial technologies along with new challenges and opportunities for the economic entities' development.

The article uses general scientific methods of synthesis and analysis, systematization, generalization, induction and deduction.

The analysis assesses the transition of Kazakhstan's economic entities to the digital platform and, in general, the consumer's readiness for the expected changes.

While some research has focused only on the description of differences, other work has sought to how the development of modern technology of the state factional environment and their advisability.

Scientific research, as well as global data, confirms that Fintech services provide increased personalization, flexibility, and ease of financial service delivery (PWC Report, 2017), which in turn leads to increased productivity, profitability, and availability of financial services (EY, 2016). The scope of Fintech services has now expanded beyond e-banking and the digitalization of traditional financial services. Currently, the financial services industry is focused on the consumer perspective to successfully develop and implement innovative technologies to meet the financial and user needs. Fintech services have the potential to increase efficiency, reduce risk, and promote inclusive growth (RBI Report, 2018). In addition, these technological innovations can significantly affect the traditional business models of the highly regulated financial services industry to provide a differentiated customer experience (Leong et al., 2017).

Big4 companies and the state program "Digital Kazakhstan" (Digital Kazakhstan, 2018), where the impact of financial technologies on the economy was fully reflected in a digital format, thanks to which we can speak of a sufficiently large impact and changes in financial market.

After carefully analyzing of various academic sources, the empirical basis of the study consists of the most valuable recourses: Fintech related reports of the BIG4 companies; International Monetary Fund and World Bank has a practical meaning, interest and relevance for the studies; reports of National Bank of Kazakhstan and Astana International Financial Centre and state program "Digital Kazakhstan-2020".

The research results can be used in perfect conjunction to other studies to agree or even oppose modern views regarding the running of the Fintech and economies. This publication looks at all aspects of the research and pays special attention to key issues.

Below we will try to show the essence and causes of the emergence of financial technologies, paying special attention to focus on new types of financial technologies within the framework of the coexistence of the traditional financial sector and Fintech. Being limited by the scope of the article, we consider mainly banks as representatives of the traditional financial sector, although the main theses we put forward are also true for others traditional financial structures.

Literature Review

The article consists from primary works of overseas authors in the scope of information technology, digitalization and financial technology. The authors relied on data from the state program "Digital Kazakhstan-2020", foreign and domestic experience of digitalization of the financial sector in the analysis.

With the general growth of economic function on the improvement of modern technology of the world in many academic fields, it is hardly surprising that the relationship between technology and the economy of the world has attracted considerable attention in recent years. Some aspects of technological and digital development are considered in the research of the domestic authors as Doszhan, R., Nurmagambetova, A. Pukala, R. Omar and A.Sabidullina (Doszhan, 2020).

The main challenges and perspective view of the process of digitalization of the economic sphere of Kazakhstan are considered. In contrast to numerous publications on this topic, article examines the influence of digitalization on economy and assessment of the success of adaptation to Kazakhstan conditions. The article includes data from foreign studies on the development of digitalization Arner & Barberis, C.Ray, G. Lodge, H.Zhang, J.Jegher and etc.

From the viewpoint of Khan H. (Khan, 2011), digitalization of economic mode can be characterized as the state of the most rational use of data economic indicators, liquidness and solvency, repay on capital, within its limits». Moreover,

we can agree with the Scientist J. Klomp (Klomp et.al., 2011), who believe that digitalization of financial process stand in for a state of the enterprise that allows expanding financial solvency and stability, and liquidity of the economic subjects in the long run and satisfies the requires of the enterprise in financial process for the sustainable development certain adequate economic autonomy allows resisting certain risks and threats, where economic damage to the enterprise, or undesirable change in the structure of capital.

Results and Discussion

The development processes and influence of Fintech on the financial market: overseas

"Financial innovation" as a new definition in finance is much broader. Of course, the term "digital economy" includes innovations in the field of finance. From the overseas sources about the Fintech, it is defining as:

The US Financial Stability Board (FSB, 2017) defined FinTech as financial technological innovation resulting in new business models, applications, processes or products.

The scope of technical startups that are making a revolution in such areas as online payments with mobile, transfers of money, providing loans, also the processes of fundraising, and even asset management (Munch, 2016).

Lee and Teo (2015) defined FinTech in five principles: low profit margin, light asset, expandability, innovation and easy compliance.

The short word "Fintech" was created in Silicon Valley. There most of that many IT projects were created, which later became something of an "accelerator" for modern Fintechs. Currently, London is considered the capital of financial technologies due to its big number of innovations in finance and its investment flows. In the UK, we see a main four factors for the improvement of Fintech (Douglas et al., 2015):

- active infrastructure;
- a good structured legal system;
- a transformable tax system;
- support by the Government entities to invest.

According to Chan Ray (Chan Ray, 2015), this evolution leads to the emergence of large risks and causes imbalance.

Most of the modern technology startups and large firms that are trying to develop and create new their financial services are considered Fintech. At the end of 2014, investments in this segment reached us $ 197 billion (Lodge et al., 2014). After that, the term began to refer to a large and rapidly growing industry. Further, this concept was assigned to a large and relevant industry. After studying more than 200 scientific articles that mention the word "Fintech", foreign professor Patrick Schueffel (2017) from the Fribourg School of management told that Fintech is a financial industry of modern time that uses technology to grow financial activity results of financial subjects. Speaking about the work procedures themselves, it should b noted that Fintech is inextricably linked to the Internet. In modern reality, it is impossible to imagine work without an intermediary-a bank or an insurance company. This process works through the API (Application programming interface) and is mainly controlled by special laws and regulations.

However, the main distinguishing feature is the ability of Fintech companies to create innovations. The Bank of Russia considers big data and data analysis, mobile technologies, artificial intelligence, robotics, biometrics, distributed registries, and cloud technologies to be the most promising financial technologies.

It must be said that Fintech companies are capable of creating something new. In Russia, for example, big data, mobile technologies and artificial intelligence, as well as robotics are currently being issued.

According to research by the Bank of Russia (Bank of Russia, 2018), the following areas are the fastest growing:

- payments and transfers: online payment services and cloud cash registers;
- terminals, mass payment services;
- financing: P2P;
- money management: Robo-consulting, etc.

Until 2008, Fintech developed thanks to the full support of financial institutions themselves. Now it works, for example, in the context of expanding online payment systems, as SWIFT (Swift, 2020) and also Visa (Visa, 2019), securities, for example, NASDAQ (Nasdaq.com, 2020). From 2008, the main driver for Fintech development has been a new policy activity of Fintech startups (Kolkman and Myers 2016).

In addition, the creation of this modern trend can be questioned, based in the previous experiences, including Bloomberg (Wigglesworth, 2015) in the early 1980s and PayPal's (Chesher et al., 2013) in the 1990s, we see no doubt that over the last ten years, the number of new subjects in financial services have raised sharply (Barnes, 2015). Differences arise not in what, but in who (i.e., the participant type of market entity – startups versus actors (Ruiz

et.al., 2016)). This modern approach of Financial technologies has been worked and developed over the past 10 years from, i.e. it is created in specific startups and they are trying to break traditional rules, for example, Bitcoin (Böhme et.al., 2014; Eyers, 2015).

The influence of Fintech on the financial market comes through:

1) through increased competition in the market itself;

2) increasing the impact of:

- an established market infrastructure
- an established structure of back – and front-office procedures in traditional financial institutions;

3) new tools of traditional institutions themselves;

4) by strengthening financial control;

5) by optimizing the risk management process.

In order to better understand new financial technologies, the authors drew Table 1 with the most actively implemented IP technologies and their brief description with the main directions of their application (problems that they help to solve).

Table 1 – Core FinTech technologies

Technologies by theme	Description	Problem being solved
Artificial intelligence	A set of technologies to enable computers to execute "smart" tasks through technologies such as natural language processing, expert systems and machine learning, a process that applies algorithms to analyze data to generate insights and make predictions.	Automates labor-intensive tasks and helps improve customer experiences by generating insights and making predictions.
Big Data/ Analytics	Uses analytical tools to process large data sets from multiple different sources driving business decisions.	Significantly reduces the time and error from traditional and often manual business intelligence methods.
Quantum Computing	Applies principles from quantum theory to develop computers with significantly more processing power.	Solves complex problems much more effectively than conventional computers.
Peer 2 Peer Finance	A technology-based service that connects businesses directly with investors, through a web-based platform for a fee.	Expands access to financing, in particular for SMEs, and makes verification/credit checking easier for investors
Open Banking	Uses application program interfaces (APIs) that allow third-party service providers to access customer banking data.	Uses application program interfaces (APIs) that allow third-party service providers to access customer banking data.
Mobility	Describes the ability to access information or applications in an untethered manner, usually through portable, networked computing devices such as smartphones.	Enables user to access information and applications "on the go", without needing to be in a fixed location.
Blockchain	Tracks and records data using a distributed digital ledger system – verifying and storing data across hundreds or thousands of computers globally.	Removes the need, and associated cost, of keeping transactions/ contracts in a central repository database, improves accountability and improves security.
Cybersecurity	A set of technologies, processes and practices used to protect networks, computers, programs and data from attack or unauthorized access.	Data breaches are a major issue, impacting 22 global financial institutions, incl. Lloyds and Santander. A global market worth ~$75 billion in 2015.
Cloud adoption	Stores resources on the internet (in a "cloud") and retrieves them using web-based tools and applications instead of on a direct server connection.	Cloud adoption significantly reduces banks' capital expenditure on expensive internal servers.
Note – compiled by authors		

As can be seen from table 1, we can say that the variety of new financial technologies is very wide and is growing every year. The rapid change in the economic situation in the world, such as the COVID-19 pandemic, gives even more drive to the development of this area. The region is expanding both abroad and in Kazakhstan.

In Fintech's most rudimentary area of digital/ mobile banking, an estimated 2 billion users worldwide were accessing retail-banking services via smartphones, tablets, PCs and smart watches, and that number is projected to reach 3 billion by 2021. In terms of adoption, 33% of consumers in 20 major markets are estimated to use Fintech services. This rate is higher at 46% across the emerging markets of Brazil, China, India, Mexico and South Africa. Investments across Fintech space is on the rise and are also a good indicator of Fintech's size and scale. According to the KPMG Pulse of FinTech report, global Fintech investment reached $57.9 billion in the first half of 2018, across 875 deals. This is a significant increase from the $38.1 billion invested in all of 2017 (KPMG, 2019).

Cooperation between countries in the field of Fintech is actively discussed by the World Bank and the International monetary Fund (IMF). These organizations proposed the Baltic Fintech promotion agenda in 2018 (Bali Fintech Agenda), which reflects the main goals of cooperation in the relevant markets (IMF and World Bank Group, 2019):

- Development of competition;
- Expanding the reach of the population;
- Development of financial markets;
- Monitoring changes in financial systems;
- Providing a sustainable financial and information infrastructure to support the benefits of using Fintech tools;
- Ensuring international information exchange.

Now an interesting era is beginning in Fintech. The stage of digitalization of the classic Bank has ended, when traditional business models were simply adapted for digital channels. Now we see digital-native scenarios that are being born in the world of 2020: a world where people live the digital experience and businesses are built among platforms and ecosystems.

Fintech include asset management technologies, insurance, legal technologies, and sub-categories such as lending, Analytics, digital identity and cybersecurity, crowdfunding, robotic advisors, neo-banking, and so on.

In this new world, companies have the opportunity to influence user behavior more deeply and faster, and I wonder where Fintechs armed with AI and platform multipliers will put their efforts.

Thus, the main development trends are observed not only in banking, but even in financial management in any organizations. Blockchain, Cybersecurity and Cloud adoption are receiving close attention from all over the world and are being used in a wide variety of areas. These innovations are often based on blockchain technology. It, in turn, can be closely intertwined with more General areas: cloud technologies, the Internet of things, artificial intelligence, machine learning, and biometrics. The confrontation between flexible and relatively low-cost FINTECH and the cumbersome bureaucratic "traditional" financial system is gaining momentum. This is already most noticeable in the following segments:

- traditional banks vs. online banks;
- traditional lending vs. P2P lending;
- traditional asset management vs. robotic expert advisors.

The development and impact of Fintech on the financial market: Kazakhstani practice

New digital technologies are currently transforming the form in which existing financial products and services are offered to customers. We should not underestimate the ability of traditional market participants to assimilate innovative ideas, but we are seeing a truly revolutionary transformation in the financial sector. At the same time, such transformations will be most active in the near future in the consumer banking and payments sectors (where revolutionary changes are already being observed), followed by insurance and asset management.

68% of respondents surveyed by EY in 2019 are willing to consider the financial offer of a non-financial service company. 45% of them are open to offers from retail and 44% – for Telecom companies. This means that consumers are increasingly trusting Fintech companies and non-banking organizations (inbusiness.kz, 2020).

In financial markets, regulatory authorities have set up several initiatives, including regulatory sandboxes and innovation hubs, to engage and support financial technology (Fintech) start-ups (ESMA, 2019; UNSGSA et al., 2019). These examples illustrate an increasing focus on supporting sector-specific incubator organizations to foster novelty in regulated sectors. Scholars such as Stayton and Mangematin (2019) hold that individualized investigation of these industries is necessary due to their peculiarities (e.g., regulatory environment), making each relevant for dedicated

research. Thus, we investigate regulatory sandboxes as important support instruments for Fintech start-ups in financial markets, following recent contributions investigating this sector (Gazel and Schwienbacher, 2020; Haddad and Hornuf, 2018; Laidroo and Avarmaa, 2019).

Regulatory framework

1. Astana Financial Services Authority

AIFC regulatory sandbox – Fintech Lab AIFC's financial services regulator, the Astana Financial Services Authority (AFSA) is fostering financial innovation in AIFC and the wider region, and it strives to establish a favorable regulatory environment for Fintech enterprises. AFSA is independent of the Kazakhstani financial regulators, i.e. the NBK and Financial Agency. In January 2018, AFSA launched the first regulatory sandbox in the region called the "Fintech Lab", which allows firms to test out and develop innovative products, and services under a special regulatory regime with tailor-made regulatory requirements applicable for each individual firm. In addition, Fintech Lab participant firms may also obtain individual guidance from the regulator about how the rules are applied to new business models and innovative financial services. Currently, there are 26 firms that have been accepted to the Fintech Lab in total from 11 jurisdictions, offering 7 different types of innovative financial services (Ministry of National Economy and Ministry of Digital Development, 2020).

In July 2018, the AFSA developed the legal framework to regulate the activities, related to operations with Digital Assets such as: operating crypto-exchanges; providing custody of digital assets; and Initial Coin Offerings (ICOs).

In June 2019, the AFSA with the support of European Bank for Reconstruction and Development (EBRD), and the leading UK law firm, Clifford Chance LLP has developed, and introduced a regulatory framework for loan- and investment-based crowdfunding platforms in the AIFC.

In January 2020, the AFSA extended the list of regulated activities in the AIFC (two new Regulated and three new Market Activities, such as: operating payment systems, operating a multilateral trading facility, etc. were introduced).

The AFSA's priorities in 2020 will include further strengthening of the Fintech regulatory environment. Upcoming initiatives will cover the development of the Frameworks on E-Money and Payment services, Mobile/Digital Banking, Venture capital financing, IP rights, E-commerce, and others. Global Financial Innovation Network (GFIN) AFSA is a member of the GFIN Coordination Group, which is a supreme body in designing the regulatory policies of the network functioning. During 2019, AFSA participated in the pilot phase of GFIN's cross-border sandbox testing work stream, which provides opportunity for FinTech firms to apply for testing innovative financial services in multiple jurisdictions, including the AIFC, UK, Hong Kong and Singapore, and to gain real-time insight into how a product or service might operate in those markets.

2. The central bank (National Bank or NBK) and the Agency on Regulation and Development of the financial market of Kazakhstan (Financial Agency).

In July 2018, by virtue of amendments to the Law of the Republic about NBK, a "special regulatory regime", i.e. a regulatory sandbox was launched by the NBK. With the formation of a Financial Agency in November 2019, the competences of both financial regulators of Kazakhstan have been assigned regarding the regulatory sandbox as follows: the NBK has introduced a special regulatory regime regarding payment organizations and/or other legal entities not being financial organizations for the purposes of providing payment services, and regulates their activities within its remits; and the Financial Agency has introduced a special regulatory regime regarding the financial organization and/or other legal entities, and regulates their activities within its remits.

The NBK is working to create Open API standards and regulations for commercial banks in Kazakhstan. The NBK, within the framework of the "Digital Kazakhstan" state program, plans to launch the "Implementation of regulation regarding the creation of open platforms (Open API) in the financial industry" project. It aims to boost competition in the financial market by young Fintech-challengers. The implementation of the project will stimulate Fintech companies' development, simplify the procedures of the interaction of customers with financial market participants and Fintech companies, and ensure geographic accessibility. The project has software which requires a description of the interaction between participants, the composition of transmitted data, and examples of transmitted messages. A number of legislative initiatives have been launched to define the legal status of new technologies and create a regulatory environment conducive to their development. For example, draft laws on remote identification, big data and artificial intelligence have started to be actively drafted.

In June 2020, the presentation of a new Concept on the use of digital technologies in the financial sector was held by the NBK, and the Financial Agency.

The aim of that Concept is to form an environment for the implementation of innovations, stimulate collaboration between market participants and build a friendly environment for Fintech areas. The concept will be implemented in three stages from 2020 to 2025:

- 2020-2021: the anti-crisis agenda and creation of Foundation for digital infrastructure;
- 2022-2023: creation of the regulatory framework and building the main elements of the digital infrastructure;
- in 2024-2025, further development of digital financial infrastructure. This includes the launching of a national digital currency, expanding the Open API services and Open banking infrastructure, expanding opportunities for cross-border payments within the framework of the EU. The project includes three main areas – "Digital Regulator", "Digital Infrastructure" and "Living Environment".

Internet and mobile penetration rates have significantly increased in the region over the past few years. Banks are leveraging mobile and internet banking to provide better financial access in the remote and rural areas. Low access to the formal financial sector but high and increasing mobile, and internet penetration provide a massive opportunity for Fintech companies in the region to offer financial services to traditionally underserved segments. The volume of digital payments in Kazakhstan increased by more than 2 times in 2019. The growth was due to the Kaspi.kz strategy (see Kaspi's case on the next page), development of the infrastructure of trading POS-terminals, the entry of Apple Pay and Samsung Pay into the markets of Kazakhstan, further encouragement for cashless payments bonuses and cashback, as well as the active use of cashless payments on all types of the public transportation. Kazakhstan is developing its policy towards the fostering and development of a digital economy and innovations. The "Digital Kazakhstan" state program envisages the development of the economy through the diversification and development of alternative financing strategy engaging Fintech. The objective of the program is to accelerate the pace of the country's economic development and improve quality of life for the population, using digital technologies in the medium term and developing the processes of formation of a digital economy for the long-term.

Fintech cluster develops for and around the banks, by introducing innovative technological solutions and products into their business processes and operational activities.

"Kaspi.kz" is the largest Payments, Marketplace and Fintech Ecosystem in Kazakhstan with a leading market share in each of its key products and services. The Company is revolutionizing the way people pay, shop and manage their personal finances with their popular Kaspi.kz Mobile App, which currently has over 6 million users and has become an integral part of their daily lives. The initial hook was payments, allowing users to pay P2P to both friends and small businesses, pay bills, and send gift payments. But overtime, the app has fleshed out its offering. It lets users log onto their tax accounts through the app, pay their bills, and purchase items – be that household appliances or loans – through its marketplace, with the option of paying in instalments.

Figure 1 shows non-cash volume circulation in Kazakhstan over the past 5 years. Calculations are provided by the AIFC.

The figure shows that slow growth occurred from the beginning of 2015 to 2017 (from 3.2 to 15.9 billion $). Since the beginning of 2018, with the introduction of new financial technologies by Kaspi Bank, the country has started to actively increase non-cash payments (up to $34.8 billion). A rapid doubling of growth occurred over the year (from 2018 to 2019).

In 2019, Kaspi made 515 mln USD profit (74 mln. USD marketplace, 369 mln. USD FinTech platform and 73 mln. USD payments business). Kaspi.kz Mobile App has become the leading mobile app in Kazakhstan, with Monthly Active Users has increased by 2.9 million to 6.0 million in December 2019 from 3.1 million in December 2018. Kaspi had a 32% market share in consumer lending in 2019, 46% in ecommerce and was number one by growth in the country's savings sector.

The infrastructure and legal framework for the development of financial technologies remains an open question. After all, they create an eco-environment for the development and introduction of new financial technologies in the country.

Nowadays Kazakhstan is developing its own FinTech ecosystem. In order to determine the opportunities for the development of FinTech, the authors created a table with the adopted programs of the state authorities, highlighting regulatory sandboxes and the availability of exchanges for digital tools, taking them as the main base for the formation of the FinTech sector of countries as a whole, while creating a favorable climate.

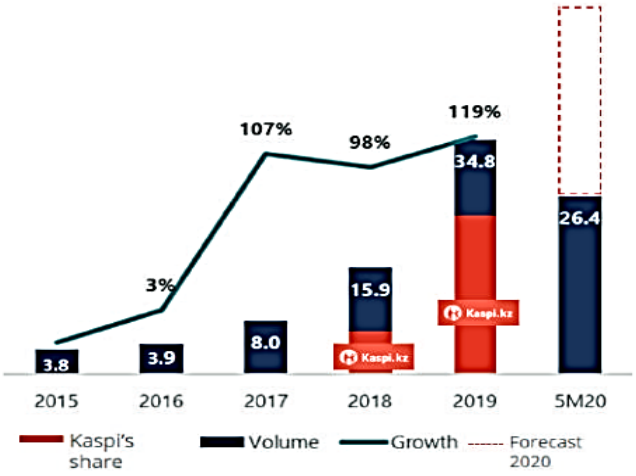

Figure 1 – Volume of non-cash payments, bln. USD
Source: Astana International Financial Centre (AIFC, 2020)

Table 2 – Infrastructure for the FinTech market

Kazakhstan	Uzbekistan	The Kyrgyz Republic	Tajikistan and Turkmenistan	Russia
The "Digital Kazakhstan" state programme Global Financial Innovation Network	"On the measures for further development of the circulation of crypto assets in the Republic of Uzbekistan" "On additional measures to improve the mechanisms for financing projects in the field of entrepreneurship and innovation"	"The Concept for the Development of Digital Payment Technologies in the Kyrgyz Republic for 2020– 2022"	Tajikistan – not technically ready for the implementation of new digital technologies Turkmenistan- There is an acute insufficiency of available information	Digital Economy program (adopted in 2019)
There are two regulatory sandboxes: one is driven by the National Bank and the Financial Agency, the other, Fintech Lab, was launched by the AIFC.	One regulatory sandbox "Uzbekistan Blockchain Valley	-	Not available information	The Bank of Russia also provides a regulatory sandbox
-	Uzbekistan Cryptocurrency Exchang (UzNEX)	-	Not available information	-
Note – compiled by authors				

As can be seen from Table 2, Uzbekistan has created its own new exchange for cryptocurrencies and is taking active steps to introduce FinTech at the legislative level. Russia is trying to develop the FinTech sector at approximately the same pace as Kazakhstan, and there is not enough information for research on the countries of Turkmenistan and Tajikistan. Kyrgyzstan also began to adopt changes at the legislative level.

Today, innovation, research and development are an important part of political ambitions in most developed and growing countries. In order to identify the level of innovations and the positions of countries by aggregate indicators of, a comparative table 3 is provided below. Malaysia, as one of the leaders in FINTECH innovation, is also taken for comparison with the developing countries of Central Asia.

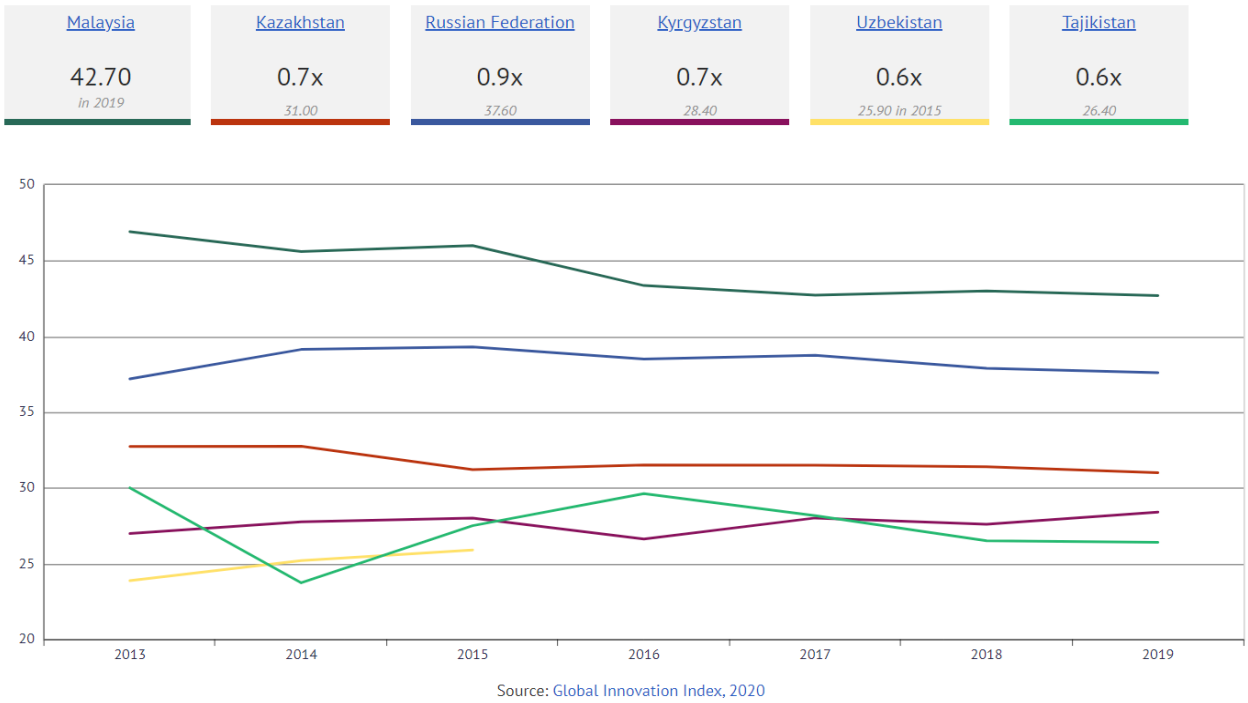

Figure 2 – Global Innovation Index comparison
Note – compiled by authors based on Global Innovation Index, 2020

Malaysia is the top country by score – global innovation index among 5 countries. As of 2019, score – global innovation index in Malaysia was 42.7 score, 100=max strength 0=weakest that accounts for 25.71% of total score – global innovation index. The top 5 countries (others are Russian Federation, Kazakhstan, Kyrgyzstan, and Tajikistan) account for 100.00% of it. The technologies used in the financial services industry, creating solutions that simplify, reduce and make more transparent for consumers, whether a company or an individual, doing business, investments, payments, insurance, etc. The Demand for Fintech is growing, especially in these difficult times when the world is experiencing an economic crisis and faced with global pandemic.

However, the legal status of Fintech services in the field of lending in Kazakhstan has not yet been determined. For companies that provide credit services via the Internet, this situation is risky, since at any time the state can unilaterally change the rules of the game. To limitation of the risks, the Kazakhstan Fintech Association started a dialogue with the authorized body represented by the National Bank. The main task of interaction is to make appropriate changes to the legislation.

At the same time, there are new challenges are emerging that are facing new opportunities. New challenges to further digitalization of financial relations are the absence in the Republic of Kazakhstan according to Digital Kazakhstan program:

- effective regulation;
- unified standards for the electronic interaction of the financial sector with state information systems and databases;
- universal mechanism for remote client identification;
- insufficient financial literacy of the population;
- fraud.

At the same time, according to our President (www.gov.kz), Digital Kazakhstan did not pass even the preliminary exams caused by the state of emergency. Certain indicators have not been achieved, but this is the first document that shows the need for technology development and reflects new challenges that are still not resolved.

Kazakhstan is no different and has its own FinTech development specifics. Strong competition in the banking sector has the potential to boost the development of a FinTech cluster.

Conclusion

Summing up, we can say the following:

Fintech, being based on innovative models of financial services, is a manifestation of the process of informatization of the financial sector under the influence of new technologies;

since fintech at the present stage is associated with the entry of non-financial companies into the financial services market, it can be interpreted as one of the areas of financialization of the economy;

It can be assumed that the financial services market will be dominated by companies that combine traditional and innovative models and tools for providing financial services in one form or another. Fintech operators will migrate towards the introduction of certain traditional technologies in their activities, while traditional financial institutions will gradually apply elements of Fintech. The Fintech industry continues to grow rapidly, and now it is no longer just the intersection of finance and technology. Modern Fintech is not just one, but several areas at once, which, however, are often closely interrelated.

The Global Innovation Index is a global survey and its accompanying ranking of countries in the world by the level of innovative development. This indicator revealed a serious backwardness in the development of the Central Asian countries and reflects the need to strengthen measures to ensure the growth of innovation activity in a number of the countries listed above, including Kazakhstan.

Moreover, it should be noted that the digitalization of financial markets in the world will stimulate the creation of new ways of further economic development with positive results. It should also be created under the influence of modern realities and trends in the development of the economic situation in the country and in the world. Consumer demand is a leading driver for accelerated adoption of new financial technologies. At the same time, it is necessary to take into account the state of infrastructure in the country and adopt the experience of leading countries in order to avoid mistakes.

The risks of cyber threats increase with the development of new technologies. In this regard, the National Bank and the Astana International Financial Center should pay great attention to security measures in the field of information and financial infrastructure. Thus, the evolutionary nature of Fintech requires constant monitoring in order to identify and eliminate emerging risks to financial stability. As Fintech spreads, regulators and central banks should prioritize monitoring macro-financial risks and preventing the use of new technologies for fraud, money laundering and terrorist financing; identifying and managing operational risks associated with third-party service providers; maintaining the resilience of financial institutions and reliable and efficient payment systems in light of the growing role of non-financial companies.

There is a positive investment trend in the Fintech industry all over the world. In any case, Fintech is designed to resolve many contradictions and form the basis for deep transformations that go far beyond the sphere of finance. Kazakhstan's financial market realities are a vivid example of the accelerated development of new financial technologies, which strongly affects the structure of doing business in general.

The data for the publication were collected with the financial support of the grant project AP08053346 "Research of sustainable development innovations from the point of view of their economic feasibility and building effective enterprise management in the Republic of Kazakhstan".

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