FINTECH MARKET AND RELATIONSHIP OF THE FINTECH INVESTMENTS TO BANKS REVENUES: EVIDENCE FROM KAZAKHSTAN COMPARED WITH UNITED STATES

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ABSTRACT

Nowadays, banks are experiencing a period in which financial technology is changing the fundamental concepts of banking products. The first step that every bank should take is proper investment in financial technologies. Instead of Kazakhstani banks, however, it is the government that is making huge efforts to develop the FinTech market. The goal of this review paper is to evaluate the development of the FinTech market of Kazakhstan and demonstrate the inefficiency of investments for the main industry of the financial market, namely, Kazakhstani second-tier banks. Review of studies on Kazakhstan's fintech market development made along with testing the hypothesis that government investments have no relationship with bank revenues. A relationship analysis was conducted between on the one hand "FinTech investments in Kazakhstan" and on the other hand "revenues from account management", "Revenues from lending and financing", "Revenues from payments", and "Revenues from financial assets and capital markets" of the banking industry of Kazakhstan and the US. The analysis showed the weakest relationship of "FinTech investments in Kazakhstan" to "revenues from lending and financing" for Kazakhstan and equally weak relationship to "revenues from account management", "Revenues from payments", and "Revenues from financial assets and capital markets". In addition, analysis shows that all four types of revenue have a strong relationship with investment for the US and correlation analysis resulted in the strongest relationship to "revenues from payments" for the US. Analysis points out positive relationship of investments to fintech market of US and reverse state for Kazakhstan.

Findings: The level of penetration of FinTech in the Kazakhstani market is markedly below that of developed economies. Investments in FinTech are more income efficient for US banks than is the case with Kazakhstani banks. Kazakhstan's financial market mostly consists of commercial banks and efforts to develop the FinTech market largely sourced from the government have no relation with bank incomes.

Keywords: Government, Program, AIFC, Banking, Correlation, Investments, Revenues, Development.

JEL Classification G15, G21, O32

INTRODUCTION

The development of internet technology has tremendously transformed industries across all economic sectors, bringing about notable benefits for firms, consumers, and government authorities around the globe. The banking sector is one of the areas that potentially stands to change the most in the future as a result of the new technologies being introduced (Salnikova, 2019). The potential of the latest waves of technologies (all of which are designed for seamless integration into people's lives) is such that the very existence of traditional banks is brought into question (Lipton et al., 2016). The digitalization of services often results in the creation of brand-new digital platforms (Aitbenbetova et al., 2018) and disrupts the value chain of financial services (Bachaev & Karpova, 2018). The latest technologies force institutions such as banks to adapt or be left behind. Among these technologies, is a phenomenon called FinTech. There is no universally accepted definition of FinTech, but it is described in this paper as a method through which technology is utilized to develop new financial services (Thakor, 2020). According to Frost (2020), FinTech can contribute to more comprehensive financial inclusion. However, the ease with which it can be adopted depends on factors such as demographics, regulation, and the cost of more traditional financial services.

Kazakhstan is a country in Central Asia that, in the long term, strives to become a financial centre for the Commonwealth of Independent States (CIS) countries. In addition, the government of Kazakhstan, aware of the boom in the FinTech market, is trying to keep up with the development of this industry. Similar to its Central Asian peers, Kazakhstan is a growing market characterized by unique factors that distinguish it as a notable hub for the development and adoption of FinTech (Desaj, 2017). Kazakhstan recognizes that the potential benefits to be derived from FinTech are essential to realizing national economic objectives and strategy. Notably, the FinTech innovations seek to provide solutions to the challenges facing Kazakhstan's financial sector; which include a volatile capital market, weak regulations, low transparency, inadequate corporate governance (Orazalin & Akhmetzhanov, 2019), and a large unbanked population (Kapparov, 2018).

Thus, the government of Kazakhstan has initiated many projects, which are mainly implemented through the Astana International Financial Centre (AIFC). The AIFC, in the role of a trusted state organization, organizes various projects for the development of the FinTech market as a whole. The cultivation of specialists; cooperation with educational institutions; the organization of various programming competitions, hackathons, accelerators, and hubs; the establishment of educational centres for additional training; and the opening of new concepts of programming schools are examples of activities in which the AIFC engages.

However, the financial market in Kazakhstan is mainly composed of second-tier banks. This means that in order to investigate the state of market development, it is first necessary to investigate banks. The banks of Kazakhstan are not like full-fledged traditional banks of the market in terms of the range of banking products. Banks of Kazakhstan offer a narrow profile of banking products, in particular providing deposits, loans, and insurance.

Observing the activities of the state in this matter and the avoidance of banks of innovations and changes leads to the question, "Is there any relationship between investment efforts and the yields of commercial banks?" This paper attempts to answer this question by defining the

relationship between investments and incomes of second-tier banks along and researching the development of Kazakhstan's FinTech market.

LITERATURE REVIEW

State of FinTech Investment in Kazakhstan

Kazakhstan is at the heart of Central Asia, an economic region that, under China's Belt and Road Initiative, acts as a bridge between China and Europe, two of the world's largest economies. The developing countries of Europe and Central Asia have a high proportion of adults who receive payments from their government. In Kazakhstan, roughly 30% of adults receive government payments, of which approximately 66% receive payments deposited into an account (Demirgüç-Kunt et al., 2018). In 2019, Kazakhstan was ranked 25th in the World Bank Ease of Doing Business List, which evaluates the business conditions in 190 countries across the globe. The economy is currently transitioning from a commodity model into an innovative model, through which it seeks to, amongst others, establish itself as a hub for FinTech companies in Central Asia. A report by the Ernst and Young Global Financial Services Institute identified low margins, an asset-light model, scalability, innovation, and ease of compliance driving as the driving factors for the successful development of FinTech (Lee & Teo, 2015). The present financial market conditions in Kazakhstan indicate that the economy has a great potential to become a major FinTech hub in the Central Asia region.

Settling in developing countries, in terms of finance, remains a challenge for Kazakhstani banks, due to the limitation of their capital, inadequate management, and a shortage in the number of viable bank products, as well as weak financial inclusion. Kazakhstani banks are faced with many fewer obstacles when entering the financial industry of any of the CIS countries (Mingaleva et al., 2016). This can partly be attributed to the disruptions and the instability brought about by the breakup of the Soviet Union (Morgan et al., 2019).

Significant efforts have been made in Kazakhstan towards attracting domestic and foreign investment, protecting intellectual property, and creating an enabling environment for start-ups to thrive. According to Tinnilä (2012), research about the future has revealed several common trends, one of which is the need for ever-present ICT services, a quality that FinTech can offer and one which online insurance sales in Kazakhstan can vouch for (Kim et al., 2019). The AIFC was established to oversee the formulation and coordination of relevant legislative initiatives, along with the preparation of FinTech projects for financing opportunities. This is achieved in cooperation with private investors and investment funds that cite an interest in financing FinTech operations within the economy. The AIFC seeks to facilitate foreign investment by establishing an English-language common-law jurisdiction, involving foreign judges and making use of the Anglo-Saxon legal system (Moroz, 2019; Myrzaliyeva, 2016) while being independent of Kazakhstan and its regulations (Zambrana-Tévar, 2019).

The AIFC FinTech hub is a collection of financial technologies developed with the objectives of developing the Kazakhstani FinTech community; creating partnerships with financial companies, traditional banks, associations, and regulators; and supporting start-ups by providing advice, training, and expertise on the workings of the market (Buckley et al., 2020). The regulatory framework is crucial in terms of stability for financial institutions (Zhanbolatova et al., 2018).

Conditions for FinTech in Kazakhstan

Countries such as Kazakhstan rely on the development of internet-related banking due to characteristics like a large territory, low population density, and very expensive coverage in terms of traditional bank services (Shustova & Blagoev, 2018). Looking at the Kazakhstani economy, it is notable that it has all the necessary conditions dependent upon which FinTech markets develop. As of May 2017, there were 33 Kazakhstani banks, with assets amounting to 24,901.1 trillion KZT in total (Lygina et al., 2017). Kazakhstan provides industry players access to a largely undeveloped regional market (East Europe and Central Asia) of about 200 million people, many of whom do not have bank accounts.

Furthermore, the role of human capital in advancing economic growth in Kazakhstan and other Central Asian countries is crucial (Rehman et al., 2018). Regarding the human capital available for Kazakhstani's FinTech companies, it is worth noting that the Bolashak Program has so far seen to the graduation of thousands of Kazakhstani students from excellent universities, thereby creating a steady supply of personnel and specialists to work in the key sectors of the economy (Perna et al., 2015).

The other factor that makes Kazakhstan a ripe market for the development of a vibrant FinTech industry was the establishment of the AIFC legal framework. Here, the regulatory structures implemented by the AIFC work towards creating an enabling environment for the development and application of financial sector innovations (Doszhan et.al, 2020). This speaks to the fact that, contrary to the romantic notion that a company can be founded in a garage and grow to a billion-dollar market valuation in a little over a decade, the reality is that new industries require conducive legal environments to thrive, as has been demonstrated in the countries in which FinTech is widely adopted.

The latter half of the past decade has seen various regulatory authorities in Kazakhstan become more proactive in the effort to regulate the operations of the FinTech industry. Such efforts have led to the development of a regulatory sandbox whose outcomes allow effective regulatory policies to be designed to enhance the performance of FinTech innovation. Essentially, new technologies, solutions, and financial sector business models are tested through the sandbox to determine the regulatory measures necessary to optimize industry performance (Wechsler et al., 2019).

Similar to other countries in Central Asia, the Kazakhstan government is committed to improving access to banking by introducing cashless payment initiatives and developing relevant infrastructure. Along with poor infrastructure, notable barriers to financial inclusion may include restrictive regulations in Kazakhstan, costly financial services, poor financial infrastructure, poor trust in financial institutions, and the offering of financial services suited to the urban population to rural residents. In 2014, a study found that roughly 40% of the unbanked adults in Kazakhstan cite their mistrust of banks as one of the main factors preventing them from opening accounts (Kapparov, 2018). In the rest of the world, not having enough money to open an account is cited as the main reason for not having a bank account (Demirgüç-Kunt et al., 2018).

The introduction of FinTech solutions in the market has made banks better placed to provide small and medium-sized enterprises (SMEs) with easier access to financing products. This draws from the fact that FinTech enhances the financial sector's operational efficiency, thereby significantly reducing the associated costs, human input, and time required to serve SME customers Tayauova, 2012). Among the FinTech products adopted by Kazakhstani banks are

mobile terminals that allow SMEs to accept payment via UnionPay, Master Card, and Visa cards; free Smartphone apps equipped with fiscal cash registers; and online financial platforms through which SMEs can obtain low-cost financing deals to run their operations. The impact on net income in the banking industry can be demonstrated by the Kaspi bank e-commerce FinTech app, Kaspi.kz, which was significantly responsible for the 156.7 billion KZT profits realized in 2019 by Kaspi Bank (Litvishko et.al, 2020).

Internet penetration in the Central Asian region has grown significantly in the past decade with the increasing availability of smartphones. The level of penetration varies between the countries; however, Kazakhstan has the highest penetration, estimated at 77%. The country also surpasses its Central Asian peers in terms of both fixed telephone and broadband subscriptions, at 23.2 and 13.7, respectively, per 100 habitants (Kunavut et al., 2018). This relatively high level of internet and smartphone penetration in Kazakhstan provides an opportunity for banks to supply the unbanked populations with internet and mobile banking services. In so doing, the financial service providers leverage the market opportunities in the economy to boost their revenues through service innovation and diversification.

The spread of the mobile payment market (i.e., Apple Pay or Samsung Pay) in Kazakhstan is beneficial, as it is one of the fastest-growing FinTech services worldwide (Kim et al., 2015). Moreover, the penetration of mobile and internet technologies in the economy and the subsequent adoption of cashless payment systems have contributed to the growth of Kazakhstan's e-commerce market. According to Kunavut et al. (2018), it is common for Kazakhstani people to have more than one mobile cellular device per person. As the regional leader in internet and mobile technology penetration, Kazakhstan's e-commerce market is also the largest in the region and was valued at an estimated $2,143.4 million in 2019 (Georgieva et.al, 2020).

Kaspi.kz has about 2 million users in Kazakhstan and allows users to manage their finances online, make payments without commissions, and buy merchandise in instalments and on credit, all from the comfort of their own homes. Mobile banking FinTech products were significantly responsible for the 156.7 billion KZT net income realized by Kaspi Bank in 2019 (Litvishko et al., 2020). Kaspi also developed a terminal, Kaspi POS, that can accept non-cash payments (Litvishko et al., 2020).

AIMS

In order to evaluate the market development of the FinTech market of Kazakhstan and prove that investments are not paying back in the form of revenues of commercial banks aims below needs to be addressed. Given that commercial banks remain the main participants in the FinTech market of Kazakhstan, it would not be correct to claim that the FinTech market is developing without the participation of commercial banks. To prove investments do not align with the revenues, following aims must be achieved:

1. Determine how much investment has been made in the FinTech market of Kazakhstan.
2. Determine how much revenue is realized by the banking sector in Kazakhstan.
3. Use regression analysis to define the relationship between investments in FinTech and banking sector revenues in Kazakhstan.

GENERALIZATION OF THE MAIN STATEMENTS

A qualitative methodological approach has been adopted for this study, because it enables to draw new conclusions about a topic by getting as close as possible to the topic (Aspers & Corte, 2019) and due to its apparent suitability to help to understand the relationships among phenomena. The approach utilizes qualitative research methodologies that make use of non-numerical data upon whose analysis a researcher gains a deeper insight into the relationships among various variables. Qualitative studies thus seek to understand the relationships, processes, symbols, interpretations, and meanings of the different phenomena under study. This type of research gives rise to descriptive data interpreted through systematic and rigorous methods of analysing, coding, or transcribing themes.

The search strategy employed in the study specified the criteria for selecting the source materials, narrowing the search results to the relevant search terms, and identifying the databases from which the literature material would be obtained. Credible online databases and libraries were used to source the past literature that has explored relationships between adopted project management practices and organizational performance. The minimum content requirements for the selected online databases and libraries concern the field of study under which the content falls, the number of relevant publications available within a database, and their depth of coverage. Therefore, the study narrowed its exploration to online academic source databases such as Emerald Insight, ProQuest, Business Source Complete, Ebscohost, Academic Search Premier, and Elsevier. The inclusion and exclusion criteria for the publications explored in this study pertain to the qualifying merits of the literature materials yielded by the online search. Among the key considerations was that the selected publications must have been produced by a recognized authority, journal, or publisher in order to ensure the credibility of the information and the theories proposed regarding the relationships among the study variables. Another consideration was that the selected literature materials had to be peer-reviewed to further ascertain the credibility of the adopted research methodologies, outcomes, and conclusions drawn from the analysis of outcomes. The inclusion criteria also narrowed the selected literature materials to English materials published within the past decade that capture the relationships among the concepts under investigation.

RESULTS

Regression Analysis

According to the World Bank (2019) and McKinsey and Company (2016), Central Asia accounts for between 0.1 % and 0.2% of total global investments in FinTech between 2013 and 2018, half of which were made in Kazakhstan. The X values are thus estimated as 0.1%*total global investments in FinTech (Eckenrode, 2020) (Table 1).

Table 1
X VALUES ESTIMATED AS 0.1%*TOTAL GLOBAL INVESTMENTS IN FINTECH

Year	Global Investments in FinTech (X_0)	FinTech investments in Kazakhstan (X_1=0.1%*X_0) *(T KZT)*
2016	27.8$B≈11.120 *T* KZT	1,112
2017	43.4$B ≈17.360 *T* KZT	1,736
2018	59.3$B ≈23.720 *T* KZT	2,372
2019	69.2$B≈27.680 *T* KZT	2,768

* Currency rate calculated as 400 KZT for 1 US dollar
Source: Deloitte. 2019. "FinTech investors: Enthusiastic yet strategically picking their spots".

According to McKinsey and Company (2016), the banking sector derives roughly 17% of its revenues from account management operations (4% from large corporate clients, 4% from commercial/business clients, and 9% from retail clients); 21% from lending and financing operations; 39% from payment services; and 23% from financial assets and capital-market operations. Based on this, it can be assumed here that the same revenue proportions apply for Kazakhstani banks whose annual earnings (interest income + non-interest income) are expected to be derived from the four operational segments.

For instance, the 27,304.8 billion KZT (1685.8 billion KZT interest income + 25,619.0 billion KZT non-interest income) banking sector revenues for 2016 were such that 4641.816 billion KZT (17%*27304.8 billion KZT) are attributable to the newly FinTech-enhanced account management operations (Y1); 5743.008 billion KZT (21%*27,304.8 billion KZT) from lending and financing operations (Y2); 10,648.872 billion KZT (39%*27,304.8 billion KZT) from payment services segment (Y3); and 6280.104 billion KZT(23%*27304.8 billion KZT) from financial assets and capital-market operations (Y4).

Applying this procedure for the fiscal years 2017, 2018, and 2019 results in the following Table 2, which shows the total earnings realized by Kazakhstani banks as a result of investments in account management, lending and financing, payment, and financial assets and capital-market FinTech products.

Table 2
TOTAL EARNINGS BY KAZAKHSTANI BANKS BETWEEN 2016 AND 2019

Year	Interest Income *(B KZT)*	Non-interest Income *(B KZT)*	Total Earnings (Y) *(B KZT)*	Y1(17%*Y) (Ac Management) (*B KZT)*	Y2(21%*Y) (Lending & Financing) (*B KZT)*	Y3(39%*Y) (Payments) *(B KZT)*	Y4(23%*Y) (Financial Assets & Capital Markets*) (B KZT)*
2016	1,685,8	25,619,0	27,304,8	4,641,816	5,743,008	10,648,872	6,280,104
2017	2, 165,7	41 ,161,5	43,327,2	7,365,624	9,098,712	16,897,608	9,965,256
2018	2, 338,5	28, 792,6	31,131,1	5,292,287	6,537,531	12,141,129	7,160,153
2019	2,090,2	30,687,0	32,777,2	5,572,124	6,883,212	12,783,108	7,538,756

Source: The National Bank of the Republic of Kazakhstan. 2017., Nationalbank.kz. 2018., Nationalbank.kz. 2019., The National Bank of the Republic of Kazakhstan, 2020.

X = Investments in FinTech in Kazakhstan
Y1 = Bank earnings from account management operations
Y2 = Bank earnings from lending and financing operations
Y3 = Bank earnings from payment services
Y4 = Bank earnings from financial assets and capital-market operations

From the above table, a correlation analysis Table 3 can be prepared as follows:

Table 3
FACTOR ANALYSIS BETWEEN INVESTMENTS IN FINTECH AND BANK REVENUES FROM FINTECH PRODUCTS (KAZAKHSTAN)

Year	FinTech Investments in Kazakhstan (X_1) *(T KZT)*	*Earnings from Account Management Operations (Y_1) (B KZT)*	*Earnings from Lending & Financing (Y2) (B KZT)*	*Earnings from Payment Services (Y3) (B KZT)*	*Earnings from Financial Assets & Capital-Market Operations (B KZT)*
2016	1,112	4,641,816	5,743,008	10,648,872	6,280,104
2017	1,736	7,365,624	9,098,712	16,897,608	9,965,256
2018	2,372	5,292,287	6,537,531	12,141,129	7,160,153
2019	2,768	5,572,124	6,883,212	12,783,108	7,538,756

The correlation coefficients are calculated as follows:
rXY1 = 0.098432
rXY2 = 0.09608
rXY3 = 0.098432
rXY4 = 0.098432

While the figures above are indicative of weak positive correlations between investments in FinTech and banks revenues from the four product segments explored, it is apparent that the strongest positive correlations occur in three segments tied at rXY = 0.098432. This shows that account management, payment, and financial and capital-market products are the most income efficient FinTech products invested in by Kazakhstani banks (Table 4).

Table 4
REGRESSION ANALYSIS BETWEEN INVESTMENTS IN FINTECH AND BANK REVENUES FROM FINTECH PRODUCTS (UNITED STATES)

Year	Investments in FinTech *(US $ B)*	US Banking Revenue	Y1(17%*Y) (Ac Management) *($B)*	Y2(21%*Y) (Lending & Financing) *($B)*	Y3(39%*Y) (Payments) *($B)*	Y4(23%*Y) (Financial Assets & Capital Markets) *($B)*
2016	49,8	421,69	71,68	88,55	164,46	96,99
2017	25,1	440,65	74,91	92,54	171,85	101,35
2018	58	460,33	78,26	96,67	179,53	105,88
2019	59,7	477,07	81,10	100,18	186,06	109,73

Source: KPMG, 2020. "Pulse of FinTech H2'19 – US"., Statista, 2020. "Banking Revenue in The U.S. 2010-2022
Using formulae of correlation to calculate the correlation coefficient produces the following:
rXY1 = 0.5071
rXY2 = 0.5068
rXY3 = 0.5076
rXY4 = 0.5075

The above data indicates that investments in FinTech are more income efficient for US banks than for Kazakhstani banks. This is based on the fact that the correlation coefficient between investments in FinTech by US banks and revenues is much stronger than for Kazakhstani banks ($r = 0.507 > r = 0.097$). This indicates that FinTech payments ($r = 0.5076$) are the most income efficient for US banks.

DISCUSSION

There are several issues in the banking sector of Kazakhstan that must still be resolved. These challenges or issues go a long way toward explaining why FinTech investment by Kazakhstani banks is not currently conducive to income, as evidenced by the weak correlation coefficient. The challenges that must be overcome before FinTech investments by Kazakhstani banks become more income efficient include a high number of non-performing loans issued by banks and a decreasing probability of acquiring external sources of funding. Other challenges include some banks prioritizing loans to retail and consumers over the corporate sector and a high number of national currency deposits transferred to foreign currencies, creating excessive pressure on the tenge currency (Kodasheva, 2017).

Kazakhstani SMEs and the economy as a whole are underdeveloped and remain comparatively less developed in terms of financial inclusion. To put this in perspective, SMEs contributed to roughly a quarter of Kazakhstan's GDP in 2017, whereas most SMEs in the

Organisation for Economic Co-operation and Development countries contribute more than half (Kapparov, 2019). Some of the issues for SMEs in Kazakhstan include a lack of or limited access to financing, corrupt practices, poor-quality personnel, and problematic tax rates (Kapparov, 2019; Kodasheva, 2017). These issues must be addressed, because SMEs form an important sector of an economy and can be instrumental towards the diversification and development of Kazakhstan's economy, which is still a long way off.

Kazakhstan only recently initiated its FinTech acceleration program, and hence, the adoption of underlying tools by banks is only at its infancy. The majority of FinTech innovations, such as E-Wallets, made in Kazakhstan and the greater Central Asia region focus on facilitating retail payments (Drigă & Isac, 2014), which can also be used by consumers to pay bills or withdraw cash (De Luna et al., 2020). However, the FinTech industry consists of much more than just E-Wallets or digital payments. Kazakhstani banks, which include more than just the top five banks as well, must truly take advantage of the diversity offered by FinTech solutions and adopt or consider other solutions as well.

The establishment of the Digital Kazakhstan state program is a step in the right direction, as this seeks to develop and diversify the economy through the innovation of an alternative financing strategy (Berg et al., 2020). According to Sidorova (2019), Digital Kazakhstan also aims to increase entrepreneurship and improve ties between the business and science sectors. However, the poor-quality management and rampant corruption and fraud in the Kazakhstani banking sector (Kodasheva, 2017) presents tremendous challenges that could nullify any potential benefits brought on by investment in FinTech.

The weak correlation coefficient and widespread reports of dishonesty indicate that investment alone might not be sufficient, as it is clearly not producing results now. The adoption of FinTech will only bring results of a permanent nature when the current challenges are addressed, more welcoming regulations are implemented, and digitalization is widely adopted throughout the sector.

CONCLUSION

The level of penetration of FinTech in the Kazakhstani market is markedly below that of developed economies (Deloitte, 2018). From the above U.S. data, it is apparent that investments in FinTech has more relationship with revenues for U.S. banks than for Kazakhstani banks. This is due to the fact that the correlation coefficients between investments in FinTech by U.S. banks and revenues are much stronger than for banks in Kazakhstan ($r = 0.507 > r = 0.097$).

This research demonstrates that the FinTech market in Kazakhstan is poorly developed. In addition, there is no positive trend in the short term. However, the positive actions of the government in laying the groundwork for its development in the long term cannot be denied. The main explanation for the current state of affairs is the desire of the state to develop the market by pouring into secondary objects of the FinTech market, as well as the unwillingness of the banks themselves to invest in innovations and develop the FinTech market. This is normal for financial markets such as Kazakhstan, in which the market is barely oligopolistic. At this time, the regression analysis does not indicate a relationship between the efforts of the government to invest in FinTech and the profitability of the main participants in the FinTech market of Kazakhstan, that is, commercial banks.

FinTech may be the key to Kazakhstan becoming more globalized and financially efficient, but much must change before that can be realized. According to Kodasheva et al (2017), innovative banking technologies will need to be used in order to improve the quality of assets owned by

Kazakhstani banks and to monitor risks applicable to the banks. Since second-tier banks remain the main institutions of the financial market of Kazakhstan and zone of future developments in Fintech, the state being enthusiasts of Fintech market development must find compromise ways to make banks more open to innovations which in turn may become an impetus for the development of FinTech market. The findings of this review require better investment direction and research of the banking industry from the government to develop the FinTech market of Kazakhstan.

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REFERENCES

Aitbenbetova, T.S. (2018). *Innovations in Financial Sector Within the Global Digital Trends: Introduction Prospects in Kazakhstan*. PDF. Retrieved from https://elib.bsu.by/bitstream/123456789/201675/1/25-34.pdf.

Aspers, P., & Corte, U. (2019). What is qualitative in qualitative research? *Qualitative Sociology*, *42*, 139-160. Retrieved from https://link.springer.com/content/pdf/10.1007/s11133-019-9413-7.pdf

Bachaev, U.A., & Karpova, T.A. (2018). Development of the banking sector in the digital economy. *Economics: Yesterday, Today and Tomorrow*, *8*(9A), 20-26. Retrieved from http://publishing-vak.ru/file/archive-economy-2018-9/2-bachaev-karpova.pdf

Berg, G., Guadamillas, M., Natarajan, H., & Sarkar, A. (2020). *Fintech in Europe and Central Asia: Maximising Benefits and Managing Risks*. World Bank Group. Retrieved from http://documents1.worldbank.org/curated/en/640021585934004225/pdf/Fintech-in-Europe-and-Central-Asia-Maximizing-Benefits-and-Managing-Risks.pdf

Buckley, R.P., Arner, D.W., Veidt, R., & Zetzsche, D.A. (2020). Building fintech ecosystems: Regulatory sandboxes, innovation hubs and beyond. *Journal of Law and Policy*, *61*, 55-98.

De Luna, I.R., Montoro-Ríos, F., Martinez-Fiestas, M., & Casado-Aranda, L.A. (2020). Analysis of A Mobile Payment Scenario: Key Issues and Perspectives. In I.R. de Luna, F. Montoro-Ríos, M. Martinez-Fiestas & L.A. Casado-Aranda, *Impact of Mobile Services on Business Development and E-Commerce* (pp. 22-47). doi:10.4018/978-1-7998-0050-7.ch002

Deloitte. (2018). *Private Fintech As A Tool for Sustainable Business Development in Russia And Kazakhstan*. Deloitte CIS Research Center. Retrieved from https://www2.deloitte.com/ru/en/pages/research-center/articles/chastnye-finansovye-tekhnologii-kak-instrument-ustojchivogo-razvitiya-biznesa-rossii-kazahstane.html

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. World Bank Group: 1-131. Retrieved from http://documents1.worldbank.org/curated/en/332881525873182837/pdf/126033-PUB-PUBLIC-pubdate-4-19-(2018).pdf

Desaj, V. (2017). *Kazakhstan Postures as Fintech Hub of Central Asia*. INDVSTRVS. Retrieved from https://indvstrvs.com/kazakhstan-fintech-hub/.

Doszhan, R., Nurmaganbetova, A., Pukala, R., Yessenova, G., Omar, S., & Sabidullina, A. (2020). *New Challenges in The Financial Management Under The Influence Of Financial Technology*. In *E3S Web of Conferences*, 159, 1-11. Retrieved from https://www.e3s-conferences.org/articles/e3sconf/pdf/2020/19/e3sconf_btses2020_04015.pdf.

Drigă, I., & Isac, C. (2014). E-Banking services - features, challenges and benefits. *Annals of The University of Petroşani, Economics*, *14*(1), 49-58.

Eckenrode, J. (2020). Fintech Investors: Enthusiastic Yet Strategically Picking Their Spots. Deloitte. Retrieved from https://www2.deloitte.com/us/en/pages/financial-services/articles/fintech-investors-enthusiastic-yet-strategically-picking-their-spots.html.

Forecast: Banking Revenue in The U.S. 2010-2022. Statista. (2020). Statista. Retrieved from https://www.statista.com/forecasts/409713/banking-revenue-in-the-us

Frost, J. (2020). *The Economic Forces Driving Fintech Adoption Across Countries*. Bank for International Settlements: 1-13. Retrieved from https://www.bis.org/publ/work838.pdf.

Georgieva, E.A., Tovma, N.A, Nurmagambetova, A.Z., Akimbaeva, K.T., Doszhan, R.D., & Nurkasheva, H.C. (2020). Prospects for the development of the digital economy in Kazakhstan. *Central Asian Journal of Social Sciences and Humanities*, *6*(1), 54-62.

McKinsey & Company. (2016). *Impact of Fintech on Retail Banking*. Brussels. Retrieved from https://www.suerf.org/docx/l_65ded5353c5ee48d0b7d48c591b8f430_9837_suerf.pdf

International Monetary Fund. (2019). *Fintech: The Experience So Far*. Retrieved from https://www.imf.org/en/Publications/Policy-Papers/Issues/2019/06/27/Fintech-The-Experience-So-Far-47056.

Kapparov, K. (2018). *Financial Inclusion and Financial Literacy In Kazakhstan*. Asian Development Bank Institute. Retrieved from https://www.adb.org/sites/default/files/publication/460061/adbi-wp876.pdf.

Kim, N., Kushenova, M., & Kulakaeva, I. (2019). Electronic Insurance in Kazakhstan. *The Scientific Heritage*, no. 42: 10-12. Retrieved from https://translate.google.com/translate?hl=en&sl=ru&u=https://cyberleninka.ru/article/n/electronic-insurance-in-kazakhstan&prev=search&pto=aue.

Kim, Y., Park, Y.J., Choi, J., & Yeon, J. (2015). An empirical study on the adoption of fintech service: Focused on mobile payment services. *Advanced Science and Technology Letters*, *114*, 136-140. Retrieved from https://pdfs.semanticscholar.org/50e2/29eccfc2d233e177dc0e75f1df33373b3292.pdf.

Kodasheva, G., Parusimova, N., Rispekova., M., & Uchkampirova, A. (2017). Actual problems of development of the banking sector in the economy of Kazakhstan. *Banks and Bank Systems*, *12*(3), 257-268. Retrieved from: https://search.proquest.com/openview/38c2b96aae0b0e2dfa1a8fe43c3c560e/1?pq-origsite=gscholar&cbl=4368391

KPMG. (2020). *Pulse Of Fintech H2 2019*. Retrieved from https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/02/pulse-of-fintech-h2-(2019).pdf.

Kunavut, K., Okuda, A., & Lee, D. (2018). Belt and Road Initiative (BRI): Enhancing ICT connectivity in China-Central Asia Corridor. *Journal of Infrastructure, Policy and Development*, *2*(1) 116-141.

Lee, D.K.C., & Teo, E.G.S. (2015). Emergence of fintech and the basic principles. *The Journal of Financial Perspectives: Fintech*, *3*(3), 1-26.

Litvishko, O., Beketova, K., Akimova, B., Azhmukhamedova, A., & Islyam, G. (2020). *Impact of The Digital Economy on The Banking Sector*. In *E3S Web of Conferences, 159*, 1-10. EDP Sciences. Retrieved from https://www.e3s-conferences.org/articles/e3sconf/pdf/2020/19/e3sconf_btses2020_04033.pdf.

Lygina, O., Makasheva Z., & Akhmetova, G. (2017). Use of correlation analysis for forecasting of profitability of commercial banks of Kazakhstan (On the Example of JSC «Kaspi Bank»). *European Journal of Management Issues*, *25*(2), 103-108.

Mingaleva, Z., Baurzhan, I., & Assel, J. (2016). Regional aspects of banks activity: Comparative analysis of international operation of Russian and Kazakh Banks. *International Journal of Economics and Financial Issues*, 6(2S), 202-206.

Morgan, P.J., Nurgaliyeva, A., & Kydyrbayev, D. (2019). *Leveraging SME Finance Through Value Chains In Landlocked CAREC Countries: Overview*. Asian Development Bank. Retrieved from https://think-asia.org/bitstream/handle/11540/11119/adbi-wp989.pdf?sequence=1.

Moroz, S.P. (2019). Favorable Investment Climate in Kazakhstan: A Myth or Reality? *Russian Law: Theory and Practice*, 1(2): 108-120. Retrieved from https://elibrary.ru/item.asp?id=41106230

Myrzaliyeva, Zh.T. (2016). Arbitration Court under Astana International Financial Centre. *Series: Law*, *2*(82), 93-99. Retrieved from http://rep.ksu.kz/bitstream/handle/data/94/Myrzaliyeva_2016-82-2-3.pdf?sequence=3.

Orazalin, N., & Akhmetzhanov, R. (2019). Earnings management, audit quality, and cost of debt: Evidence from a Central Asian economy. *Managerial Auditing Journal*, *34*(6), 1-26.

Perna, L.W., Orosz, K., & Jumakulov, Z. (2015). Understanding the human capital benefits of a government-funded international scholarship program: An exploration of Kazakhstan's Bolashak program. *International Journal of Educational Development*, *40*, 85-97.

Rehman, Z.U., Tariq, M., & Khan, M.A. (2018). The role of human capital in economic development in the selected central Asian countries. *Dialogue (Pakistan)*, *13*(3), 235-244.

Salnikova, A.V. (2019). Use of Digital Technologies In Banking Business. Ph.D, Belarusian National Technical University: 177-181. Retrieved from http://e.biblio.bru.by/bitstream/handle/1212121212/9193/44.pdf?sequence=1

Shustova, E., & Blagoev, V. (2018). Risk management in the internet banking: The case of Kazakhstan. *Economic Studies*, *27*(5), 135-146. Retrieved from https://www.ceeol.com/search/article-detail?id=733001.

Sidorova, A.V. (2019). Digital Kazakhstan - the process of creating a government network infrastructure in the republic of Kazakhstan. *International Scientific Journal*, *4*(29), 166-168.

Tayauova, G. (2012). Advantages and disadvantages of outsourcing: Analysis of outsourcing practices of Kazakhstan banks. *Procedia - Social and Behavioral Sciences*, *41*, 188-195.

Thakor, A.V. (2020). Fintech and banking: What do we know? *Journal of Financial Intermediation*, *41*, 1-13.

The National Bank of the Republic of Kazakhstan. (2017). *Current State of the Banking Sector of Kazakhstan*. Retrieved from https://finreg.kz/cont/%D0%A2%D0%B5%D0%BA%D1%83%D1%89%D0%B5%D0%B5%20%D0%91%D0%92%D0%A3_eng_01.01.2017.pdf.

The National Bank of the Republic of Kazakhstan. (2018). *Current State of the Banking Sector of Kazakhstan*. Retrieved from https://finreg.kz/cont/%D0%A2%D0%B5%D0%BA%D1%83%D1%89%D0%B5%D0%B5%20%D0%91%D0%92%D0%A3_eng_01.01.(2018).pdf.

The National Bank of the Republic of Kazakhstan. (2019). *Current State of the Banking Sector of Kazakhstan*. Retrieved from https://finreg.kz/cont/%D0%A2%D0%B5%D0%BA%D1%83%D1%89%D0%B5%D0%B5%20%D0%91%D0%92%D0%A3_eng_01.01.(2019).pdf.

The National Bank of the Republic of Kazakhstan. (2020). *Current State of the Banking Sector of Kazakhstan*. Retrieved from http://finreg.kz/cont/%D0%A2%D0%B5%D0%BA%D1%83%D1%89%D0%B5%D0%B5%20%D0%91%D0%92%D0%A3_%D0%B0%D0%BD%D0%B3%D0%BB_01.01.2020.pdf.

Tinnilä, M. (2012). Impact of future trends on banking services. *Journal of Internet Banking and Commerce*, *17*(2).

Wechsler, M., Perlman, L., & Gurung, N. (2018). The state of regulatory sandboxes in developing countries. *SSRN Electronic Journal*, 1-45.

Zambrana-Tévar, N. (2019). The court of the Astana international financial centre in the wake of its Persian Gulf predecessors. *Erasmus Law Review*, *12*(1), 122-135.

Zhanbolatova, A., Ziyadin, S., Zhumanov, K., & Jumabekova, A. (2018). Relationship between bank competition and stability: the case of the UK. *Banks And Bank Systems*, *13*(1), 98-114.