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The impact of digital technologies on improving the efficiency of the financial market in Kazakhstan

Abstract. The trend of digitalization of financial activity has accelerated worldwide. The consequence is a corresponding transformation, modernization of the financial industry, which is carried out thanks to digital technologies. This development of the traditional financial industry has given an impetus to the acceleration of "green" finance. The green financial industry in the era of digital transformation has provided Kazakhstan with the opportunity to accelerate its entry into the digital economy. In this connection, the study of this article presented a selection of regional panel data and the results of discussions on the effectiveness of the digital economy's impact on green financial investments in Kazakhstan. OLS panel data and the boundary model method were used. At the same time, a threshold model has been built using the regional scale of the industry and green financial audit as threshold variables. The characteristics of the digitalization of the country's economy, its effectiveness of green finance are used for analysis [1].

Keywords: Financial sector; market; digital technologies; digitalization; economic growth.

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Introduction

Economic globalization gives an impetus to acceleration of foreign trade and the movement of foreign investments. In addition, many structural contradictions of economic development have found their solution in connection with the promoting of the digital economy. Awanetal et. al. [2] it was announced that the connection of information technologies with the financial industry has strengthened, and a comprehensive model has also been launched that applies to various types of enterprises – digital finance. The elimination of the disadvantages of traditional finance, comfortable services, and the absence of barriers to entry is due to digital finance. Digitalization is beneficial for the entire economy as a whole, which solves many structural problems of development and promotes high-quality economic growth. This trend is a benchmark for Kazakhstan's digital economy.

The economies of all countries of the world, including Kazakhstan, are transforming and adapting to new directions of digitalization, which has become a trigger for the promoting of green finance. All these processes create a new architecture and development model that promotes high-quality investments, economic development of Kazakhstan with a strong social effect. The digital growth of Kazakhstan's economy

continues, being the main engine of economic growth. Thus, this article reveals the topic of the possibilities of the digital economy as a lever of effective green finance.

Methodology

In this paper, an attempt is made to determine the possibilities of the digital economy in improving the efficiency of green finance and, accordingly, to give a positive impact on the qualitative development of the economy of Kazakhstan. The OLS model and the threshold model based on their parameters of in-depth study of green finance are used in combination with the prospect of further development of these trends in the digital economy. A review of the literature on the subject of the study was carried out in order to find new ways and ideas for an impetus to the acceleration of green finance.

Discussion

Governments, as well as non-governmental organizations, scientific communities are busy with the issue of digital opportunities in the mechanism of the financial system. K. Skinner has deeply considered the subtleties of modern information technologies [3]. Kai-fu Lee studied the influence of neural networks in business digitalization planning from all angles and drew his conclusions [4]. Blockchain technologies and finance are presented by M. Iansiti, K. Lakhani [5], R. Bukht, R. Heeks [6] in the form of a concept for the further development of this direction. These studies are made in search of the relationship of the main driving force, such as digitalization, to processes vulnerable to society as a whole, of course, here we are talking about the financial sector.

Taking into account the relevance, the task is to provide justification for the postulates the current and the nearest financial system in the editorial office of widespread digitalization and its impact on the security of the direction for such development. In this connection, the risks of the functioning of such digital and information technologies are considered in parallel. All subjects of the state should form clear understandings of possible threats to this development in the future. The article is aimed at forming an understanding of the further development of financial processes, based on the analysis of the current state of the financial industry, taking into account the introduction of digital technologies.

Results

The result of the study was the determination of two threshold effects, one of which is the regional scale of the industry, and the second is the audit of green finance. Based on these threshold effects, it is concluded that digitalization in the economy of Kazakhstan will prove itself well in the form of effective green financing. Positive dynamics of investment efficiency of green financing is observed in all regions of Kazakhstan. Moreover, it is proved that the regional gap in economic development can be overcome by the dynamic spread of green finance and its corresponding development in the digital economy. Kazakhstan should pay special attention to environmental audit, which also affects the development of new "green" financial instruments.

The relevance of the financial market in the context of growing geopolitical and geo-economic changes in the world is very important for maintaining the balance and stability of the socio-economic development of the country. The significant transformation of national economic systems under the influence of ongoing changes and the ongoing pandemic threat of the COVID pandemic poses new challenges for the public administration system in the field of more efficient use of resources and regulatory tools, ensuring the transparency of the activities of financial and credit organizations and financial control institutions, more accurate forecasting of financial risks, security of the rights of recipients of these financial services and increasing the responsibility of financial and credit organizations and their stimulation in terms of the implementation, among other things, of the interests of the state and society. In particular, issues of providing favorable conditions for increasing the level of competitiveness of the Kazakh economy, deeper diversification of the structure of the national economy, which, ultimately, should be reflected in improving the quality of life of the population, are of particular importance at the present stage of development of Kazakhstan.

Taking into account the pace of industrialization and the growth of investment opportunities, financial

markets were formed in the world, of course there were gaps during historical events, for example, world wars. In the fifties of the last century, it was possible to observe how developed countries are rapidly developing financial markets, restoring the economy as a whole. As we all know, the transfer of the USSR's foreign exchange reserves from New York banks to London was a signal for further scaling of this process. The main trigger is political risks, as well as due to low interest rates on deposits of the Federal Reserve System, capital outflow from the United States [7]. Monetary and credit relations have gained particular importance with the advent of electronic payment systems, the emergence of offshore centers, the widespread activity of multinational corporations, etc. A huge amount of money was managed by financial organizations, international financial institutions gained a special status in the distribution of international finance, the development of a new line of products provided by them, and the growth of their availability. Those who were not affected by the global financial and economic crisis turned out to be financial resellers. The Bank for International Settlements announced information that the total amount of liabilities on financial instruments exceeded the global GDP indicator by tens of times [8].

In 2022, the external economic situation was characterized by a negative risk sentiment. The tightening of monetary conditions by the main banks of developed governments in order to curb inflation, fears of a slowdown in global economic growth and the risks of a recession in developed countries - all this had a negative impact on world markets. Oil prices remained highly volatile, dropping just below \$100/bbl in April amid China's epidemiological restrictions and the US decision to use strategic oil reserves. At the same time, in June, the maximum value of oil quotations for the second quarter of 2022 was reached in the context of the embargo on Russian oil and ongoing geopolitical tensions.

Over the past 5 years, the total assets of the financial system have increased by 74,5% to 44.3 trillion tenge. This is 54,5% of GDP, which is significantly inferior to the indicators of countries at similar stages of economic development. The financial system is characterized by a bank-centric model - banks account for about 85% of the assets financial mechanism and 15% for other areas of the financial market. At the same time, all sectors of the financial sector have shown stable growth over the past 5 years.

In the banking sector, despite the write-off of about 7 trillion tenge of problem loans, the loan portfolio grew by 46% to 18,5 trillion tenge, which is 22.5% of GDP. The assets of insurance organizations doubled over 5 years to 1,8 trillion tenge and reached 2,3% of GDP, which is associated with an increase in insurance premiums. In the stock market, capitalization amounted to 44.2 trillion tenge or 53,8% in relation to GDP, having increased by 70% over 5 years. In the capitalization structure, 65% falls on shares, 35% - on bonds. The microfinance sector is playing an increasingly important role in SME financing. In connection with the inclusion of all credit institutions in the regulation perimeter, the volume of microloans since 2019 has increased by more than 4,5 times to 1,4 trillion tenge. In the structure of microcredits, 49% are loans to businesses and individual entrepreneurs [9].

As of the first day of 2022, there were 22 banks operating in the Republic of Kazakhstan, of which 14 were non-residents of other countries: 11 were subsidiaries and 1 was a state bank [10].

At the same time, 66.1% of the assets of all banks in Kazakhstan belong to 5 large financial organizations. In 2021, the recovery of the banking sector from insolvent banks and historically accumulated problem loans was completed. For the period 2017-2022, the volume of assets of the banking sector increased by 13,464.1 billion tenge (or 55,7%), amounting to 37,622 billion tenge at the end of 2021 (an increase over the entire period by 1.5 times). The results of 2021 showed an increase in the efficiency of the banking sector. Net profit of banks increased by 78% and amounted to 1,3 trillion tenge [11].

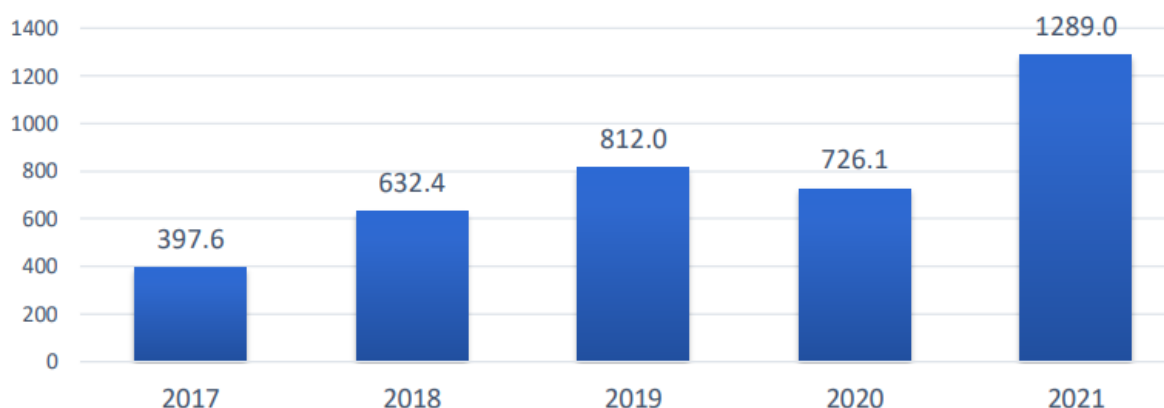


Figure 1 - Changes in the profitability of the banking sector of Kazakhstan 2017-2021, in billion tenge

The volume of total liabilities of the banking sector of Kazakhstan for the study period increased by 11,958.9 billion tenge, amounting to 33,087.1 billion tenge at the end of 2021. In the structure of total bank liabilities, the lion's share (78.6% or 26,014.8 billion tenge) falls on customer deposits.

Positive trends were also noted in terms of increasing the stability of the banking sector. Over the entire period under study, this was due to the growth of the size of the equity capital of financial organizations. Thus, the total amount of equity capital for the period 2017-2022 increased by 1,544.5 billion tenge (or 41%), amounting to 5,308.1 billion tenge at the end of the analyzed period.

The crisis of 2007-2008 demonstrated the need for the authorities a constant capital review is required for the quality and components of the loan portfolio, the development of appropriate standards in the framework of money management, and more. Of particular note here is Basel III, which was developed to prevent global financial crises by the Basel Committee on Banking Regulation and Supervision.

At the end of 2021, the banking sector of Kazakhstan showed a large margin of safety, both in terms of capitalization and liquidity indicators. The capitalization of the banking sector amounted to 23.4%, which indicates a significant capital buffer in relation to the current level of risks and allows absorbing possible risks in the future. The share of highly liquid assets amounted to 31.1% in relation to the assets of the banking sector [12]. In particular, as evidenced by the data, all liquidity ratios (current, urgent, urgent foreign exchange liquidity) are higher than the specified minimum standard value [13].

Table 1

Dynamics of liquidity indicators of the banking sector for Kazakhstan for the period 2017-2021, in %

indicator name	2017	2018	2019	2020	2021
Current liquidity ratio k4 (min value 0.3)	1,533	1,456	1,472	1,725	1,335
Quick liquidity ratio k4-1 (min value 1)	6,856	5,352	6,026	6,720	4,337
Quick liquidity ratio k4-2 (min value 0.9)	4,222	3,439	4,606	4,683	3,335
Quick liquidity ratio k4-3 (min value 0.8)	2,959	2,472	3,406	3,285	2,594
Highly liquid assets (monthly average)	8 375,5	9 034,1	9 174,6	12 649,9	11 693,0
Ratio of highly liquid assets to total assets (%)	34,7%	35,8%	34,3%	40,6%	31,1%

Note: Compiled according to ARRF data.

The credit market of the Republic of Kazakhstan is the largest segment of the country's financial market, for which the trend of qualitative development is most inherent. Strengths of the main characteristics of credit market entities (primarily banks) is the active introduction of innovative technologies, automation and reengineering of business processes. In recent years, against the background of further strengthening of competition in this market, the attention of lenders has been focused on improving the quality and speed of providing lending services, as well as the active development of remote customer service channels. At the same time, banks paid special attention to improving post-credit services and the process of their automation, which, according to experts, made it possible to strengthen control over condition of the project pipe.

Trends in the development of the credit market of Kazakhstan. 2017-2021 the total volume of the project pipe of second-tier banks in Kazakhstan increased by KZT 6,610 billion (by 48.6%), which amounted to KZT 20,200 billion at the beginning of 2022 (Figure 2).

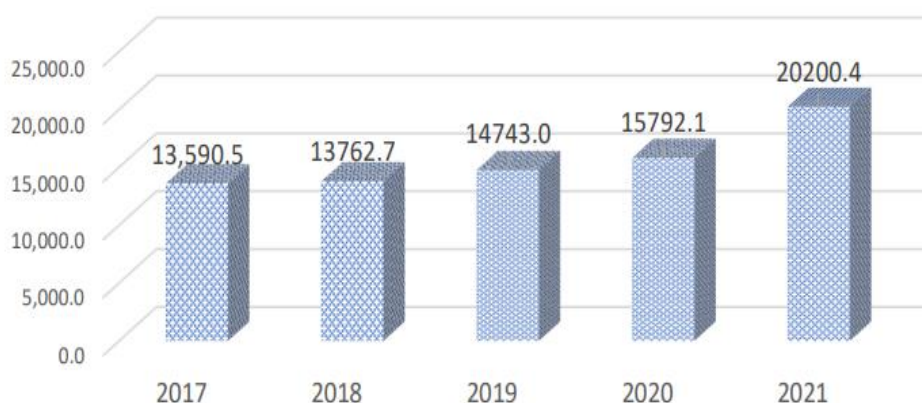
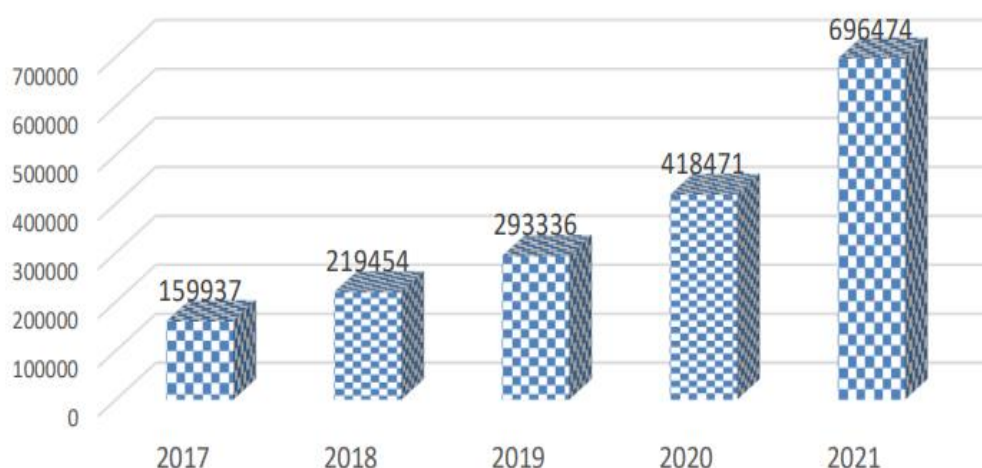


Figure 2 - Dynamics of the loan portfolio of the banking sector of Kazakhstan for the period 2017-2021, in billion tenge

In the structure of the project pipe of STBs, as the most common type of lender in the Republic of Kazakhstan, the lion's share of loans falls on loans to individuals - 49.7% (or 10,038.7 billion tenge). It is noteworthy that the share of such loans over the entire period under study increased by 18.4% (2017 - 49.7%, 2021 - 31.3%).

Up to 80% of MFI loans are issued for business purposes, and not for consumer purposes. Clearly, the dynamics of lending to clients by microfinance organizations is shown in Figure 3.



Note: based on [14].

Figure 3 - Dynamics of microcredit in our country for 2017-2021, in million tenge

Today, the coverage of the population with access to the World Wide Web is about 98% - this is an extremely high and favorable level of technological development. The COVID-19 pandemic has had an incredible impact on all processes. Of course, it is more destructive, but a breakthrough has been made in the financial technology market. Now Kazakhstan occupies a leading position in the field of financial technology market among the countries of Central Asia.

With the development of e-commerce and online lending, non-cash transactions have grown significantly in the country. Today, almost all financial institutions in Kazakhstan have remote service systems, and the number of users of online services increased by 51.6% over the year, to 27 million.

However, online lending is only part of the huge potential of fintech. The boom of cryptocurrencies, the possibilities of blockchain technology and artificial intelligence confirm that the potential for development is huge. And in order for Kazakhstan to realize its potential in fintech, it is important to overcome a number of problems, the main of which is an acute shortage of professional personnel. HR-specialists of not only fintech companies, but also any other IT-related business are well aware of this.

A large-scale modernization of the securities market infrastructure was carried out on the stock market: a new KASE trading system was introduced, a regional depository and settlement system was created on the basis of the Central Depository, and a Central Counterparty was introduced to ensure the execution of transactions on all KASE markets. The right to transfer pension savings to the management of private companies has been implemented.

The insurance market has introduced 100% online conclusion of compulsory civil liability insurance contracts for car owners. At the legislative level, incentives have been adopted for the development of accumulative life insurance and a deferred pension annuity has been introduced. Significant progress has been made in the digitalization of financial services and the introduction of remote services. Mechanisms for remote conclusion of contracts for all financial services have been implemented.

According to the OLS Model, economic variables which affect the productivity of the green economy, selected to create a multiple linear regression model according to formula (1).

$$GF_{it} = a_0 + a_1 Number + \beta X_{it} + \mu_{it} \tag{1}$$

To decipher the formula, we use the following parameters i - region, t - time of year, in addition CF - green financing. Digital economic indexes are used. a_0 is the averaged concept, a_1 is the coefficient of the regression variable, X_{it} is the main variable, β is the regression coefficient for a single main variable, and μ_{it} is the error.

Based on panel data, assumptions are verified by setting a threshold model. We applied the Hansen (1999) method for threshold variables. Thus, the volume of the regional industry is determined and opportunities for financial support. In addition, the nonlinear effects of scaling the digitalization of the economy on green finance in the regional context are considered. The model is set (2) and (3) as follows:

$$GF_{it} = a_1 Number_{it} \times I(HYGM_{it} > \gamma_1) + a_2 Number_{it} \times I(\gamma_1 < HYGM_{it} < \gamma_2) + \dots + a_n Number_{it} \times I(\gamma_{n-1} < HYGM_{it} \leq \gamma_n) + a_{n+1} Number_{it} \times I(HYGM_{it} > \gamma_n) + \theta Z_{it} + \mu_i + \varepsilon_{it} \tag{2}$$

$$GF_{it} = a_1 Number_{it} \times I(GFA_{it} > \gamma_1) + a_2 Number_{it} \times I(\gamma_1 < GFA_{it} < \gamma_2) + \dots + a_n Number_{it} \times I(\gamma_{n-1} < GFA_{it} \leq \gamma_n) + a_{n+1} Number_{it} \times I(GFA_{it} > \gamma_n) + \theta Z_{it} + \mu_i + \varepsilon_{it} \tag{3}$$

In this model, the main variable is applied as the volume of the regional industry ($HYGM_{it}$) and the possibilities of green financial audit (GFA_{it}). Thus, assumptions are 2 and 3; γ is a specific threshold value, μ_i is a personal generated effect; $I(\bullet)$ is an index function; and ε_{it} is an error. When true, the parentheses are 1. In the other case, it is 0.

We used stata16.0 software. It is optimal for the analysis of empirical tests. In the USA, such a system of statistical analysis (English statistical analysis system) is used. The system checks the relationship of variables and their significance, after which the OLS method is applied. Regression analysis of static panel data is carried out. We use the connection of control variables as much as possible to carry out regression analysis, due to which we get a double fixed effect. The results of the analysis are shown in Table 2.

Table 2

Static panel test results (OLS)					
Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Number	-0.008 *** (-4.30)	-0.005 *** (-6.71)	-0.005 *** (-4.31)	-0.005 *** (-4.51)	-0.006 *** (-4.78)
PG		0.000 ** (2.72)	0.000 *** (2.77)	0.000 ** (2.62)	0.000 *** (2.92)
Structure			-0.072 (-1.02)	-0.057 (-0.76)	-0.071 (-1.00)
Urban				-0.268 (-1.16)	-0.211 (-1.08)
Trade					-0.000 * (-1.92)
Province	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Constant	0.703 *** (5.70)	0.400 *** (6.28)	0.388 *** (5.85)	0.597 *** (3.58)	0.612 *** (4.01)
N	210	210	210	210	210
R ²	0.560	0.756	0.757	0.762	0.812

Note: ***, **, * accuracy of 1, 5 and 10% respectively, the usual inaccuracies

Regression analysis of the models showed that with the constant addition of control variables, the level of compliance continues to improve. Thus, the choice of the main interpretative variables is scientific. The results of the evaluation of specific parameters are shown in Table 3.

Table 3

Boundary model analyses		
Threshold Variable	Model 6 Regional Industry Scale	Model 7 Green Financial Audit Support
PG	2.31 × 10 ⁻⁶ *** (18.07)	2.70 × 10 ⁻⁶ *** (17.46)
Structure	-0.0836268 * (-1.96)	-0.1190686 ** (-2.38)
Urban	0.0147933 (0.29)	-0.772259 (-1.35)
Trade	-2.28 × 10 ⁻¹⁰ *** (-5.03)	-3.49 × 10 ⁻¹⁰ *** (-7.57)
Number (STP ≤ 34.9000)	-0.0047143 ** (-2.22)	
Number (34.900 < STP ≤ 47.3000)	0.2925535 *** (4.04)	
Number (STP > 47.3000)	0.539655 *** (8.46)	
Number (STP ≤ 358.7000)		-0.0046724 * (-1.90)
Number (STP > 358.7000)		-0.0220084 * (-1.89)
Constant term	0.4377224 *** (3.11)	0.5042788 *** (3.10)

Note: *, **, *** represent the significance of 10%, 5%, and 1%, respectively, with t statistics in brackets.

According to Table 3, the coefficient has become significant due to the improvement of technological innovations at the level of 5% and 1%. We can argue that the improvement of the regional scale of industry directly affects the impact of green finance and digitalization of the entire economy. On the basis of which, the development of the latter is certainly beneficial for the application of appropriate measures by state bodies in the field of green financing. At first, the analysis of the environmental financial audit demonstrated the positive role of the digital economy in stimulating green financing. Then the effect weakens. This is an

indicator of the current level of development in our country, which neglects the implementation of environmental protection projects by the government, which hinders the environmental development of enterprises. The level of economic development of Kazakhstan does not contribute to the further scaling of green finance into the digital economy. The problems of insufficient risk prevention, control and, one might say, the lack of environmental audit remain relevant.

In order to develop a unified technology platform, the Central Bank of Kazakhstan has implemented threat analysis for the rapid exchange of information in the case of cybersecurity with the financial sector and integrated its platform with the Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market and the National Information Security Coordination Center platform. In 2021, 45 organizations joined the MAC platform (malware information exchange platform), as a result, more than three hundred and thirty vulnerabilities were identified. Now the MISC solution provides data from independent sources, including Central Bank vulnerability scanning systems and open sources on the Internet (compromise indexes).

In 2021, in order to prevent cybersecurity incidents, memorandums of cooperation were concluded with six cybersecurity companies of the Republic of Kazakhstan in order to exchange information about cyber threats and vulnerabilities in the information security of financial market entities. Work was carried out on joining the international organization FIRST (Global Forum of Cybersecurity Incident Response Teams).

Last year, thanks to cooperation with the «Center for the Development of Payment and Financial Technologies» JSC, such programs as the creation of a National Digital Biometric Identification Platform (software for digital currency), the development of a national billing service and a Concept for the development of financial technologies and Innovations took place [15].

Conclusion

The priority areas for market development include:

- expanding the functionality of MFOs in terms of conducting payment transactions, which will reduce the costs of the latter when conducting such transactions through banks and will affect the reduction in the cost of credit resources;
- maximum use of the possibilities of digitalization and artificial intelligence when issuing microcredits through the use of identified digital wallets, which will also reduce the cost of redistributed resources in the form of microcredits and expand access to them by small businesses;
- creation of an apex fund, expansion of the participation of MFIs in the implementation of government programs and projects, as well as in concessional financing programs [16].

The main trends in the development of the banking market in Kazakhstan include:

- Further development of the super-app industry (digitization of banking functions, their transfer to smartphones). In other words, the idea of creating and developing applications is to improve the quality of banking services by speeding up service time and combining many of the functions necessary for the client within a single interface;
- The introduction of the principles of "green" banking is due to the need to implement the Concept for the transition of the Republic of Kazakhstan to a "green economy" [16] and the National project "Green Kazakhstan" [17]. Along with other economic actors, domestic banks will also have to join the mission to protect the environment, requiring the latter to additional expenses that will pay off in the long term in the form of staff motivation, increased customer confidence, as well as increased investor interest and loyal attitude of regulators.

According to Forrester, sustainability is the new reality. Various environmental, social, governance-oriented, and sustainable investment fintech companies have entered the market to serve value-driven clients. For example, in the US, digital bank Aspiration allows customers to measure their environmental impact with a personal sustainability assessment based on where they spend their money. In addition to banking products, Aspiration offers users solutions that allow them to invest in companies that are 100% fossil fuel free [18];

- The rapid transition of the world community to the formation of a digital economy also creates a

trend for traditional banks to lose weight in the economy. Against the background of the aggressive growth of fintech companies and other alternative forms of financial players, the trends of transformation of the banking business based on the more active introduction of IT technologies as a new source of income are gradually increasing. The main issue for banks in this matter will be to determine which transactions can be digitized to provide a deeper diversification of banking products and ensure revenue growth;

- The growth of competition and the transparency of actively implemented digital technologies will encourage banks to review their tariff policy through their transition to more transparent, simple and understandable tariffs for customers, including by optimizing transaction costs and making decisions in favor of customers;

- In order to level the costs of digitalization (the predominance of remote services over human contacts), banks will follow such an up-to-date trend as the "humanization" of banking products and services based on the introduction of artificial intelligence and more active use of voice assistants in the framework of customer interaction;

- The policy of central banks to digitize the national currency creates a trend in digital money circulation. Thus, in 2021, studies were conducted in the field of digital interaction of central banks, according to the results of which six (6) out of seventy-eight (78) countries already use their own digital currencies and at least seventeen (17) countries are piloting these projects. The National Bank of the Republic of Kazakhstan is also in the process of developing and piloting a similar project to introduce the digital tenge as part of the formation of the digital economy of Kazakhstan. Despite the rather positive trends in the development of the banking sector and the outlined promising areas of development.

However, a number of unresolved problematic issues still remain.

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Цифрлық технологиялардың Қазақстанның қаржы нарығының тиімділігін арттыруға әсері

Аннотация. Қаржы қызметін цифрландыру процесі бүкіл әлемде жеделдеді. Мұның салдары цифрлық технологиялардың арқасында жүзеге асырылатын тиісті трансформация, қаржы индустриясын жаңғырту болып табылады. Дәстүрлі қаржы индустриясының мұндай дамуы "жасыл" қаржының дамуына ықпал етті. Цифрлық трансформация дәуіріндегі жасыл қаржы индустриясы Қазақстанға оның цифрлық экономикаға кіруін жеделдетуге мүмкіндік берді. Осыған байланысты осы мақаланы зерттеуде Өңірлік панельдік деректердің таңдауы және цифрлық экономиканың Қазақстандағы жасыл қаржы инвестицияларына әсер ету тиімділігі туралы пікірталастардың нәтижелері ұсынылды. Статикалық панельдік OLS және шекті модель әдісі қолданылды. Сонымен қатар, саланың аймақтық ауқымын және экологиялық қаржылық аудитті шекті айнымалылар ретінде қолдана отырып, шекті модель құрылды. Талдау үшін ел экономикасын цифрландырудың сипаттамалары, оның жасыл қаржыландырудың тиімділігі пайдаланылады [1].

Түйін сөздер: Қаржы секторы, нарық, цифрлық технологиялар, диджитализация, экономикалық өсу.

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Влияние цифровых технологий на повышение эффективности финансового рынка Казахстана

Аннотация. Процесс цифровизации финансовой деятельности ускорился во всем мире. Следствием этого являются соответствующая трансформация, модернизация финансовой индустрии, которые осуществляются благодаря цифровым технологиям. Такое развитие традиционной финансовой индустрии способствовало развитию «зеленых» финансов. Зеленая финансовая индустрия в эпоху цифровой трансформации предоставила Казахстану возможность ускорить его вхождение в цифровую экономику. В этой связи в исследовании данной статьи были представлены подборка региональных панельных данных и результаты дискуссий об эффективности влияния цифровой экономики на зеленые финансовые инвестиции в Казахстане. Использовались статические панельные OLS и метод пороговой модели. В то же время была построена пороговая модель, использующая региональный масштаб отрасли и экологичный финансовый аудит в качестве пороговых переменных. Для анализа используются характеристики цифровизации экономики страны, ее эффективность зеленого финансирования [1].

Ключевые слова: финансовый сектор, рынок, цифровые технологии, диджитализация, экономический рост.

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