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THE INFLUENCE OF FINANCIAL INNOVATIONS ON EU COUNTRIES BANKING SYSTEMS DEVELOPMENT

Abstract. *This article summarizes the arguments and counterarguments in the framework of the scientific discussion on determining priority directions of developing banking systems, modern problems and prospects of introduction of financial innovations in the process of development of banking services. Its pace and current trends require a completely scientific basis. Accordingly, the purpose of the study is to determine the impact of modern information technology in the banking systems of the European Union countries and the future prospects for their development. For this purpose, the hypothesis was, first of all, proposed that the level of business activity of the banking activity is related to the level of development of the country's economy and it will determine in the future the development of the banking systems of these countries. An appropriate empirical study was conducted to confirm this hypothesis. The systematization of literary sources and approaches to the solution of this problem has shown that in scientific sources the analysis of the impact of financial innovations on the banking systems of individual European Union countries is mainly carried out. Taking into account the different levels of development of these countries, these studies do not allow us to make conclusions and suggestions as to the future of European banks. Electronic banking, the creation of a large number of fi tech companies, crypto volume, blockade – radically change the classical banking business. These changes are gaining momentum and the future of the banking system is now very ambiguous. Will classical banks be able to function effectively, or will new financial companies come to their place? What should I do to manage the bank to lay the groundwork for its successful operation, in the context of the rapid development of information technology? Who and how will regulate global financial markets? There are no clear answers to these questions. The methodical toolkit of the study was a clustering method, methods of systematization, grouping, comparison, expert evaluations. The study period covers 2015-2018, which shows the most rapid dynamics of changes in the processes of customer service of banks from the offline to the online sphere. In addition, this period of time is characterized by the rapid development of financial innovation, which radically changes the approaches to traditional banking activities. The article presents the results of cluster analysis, the results of which allowed to group the countries of the European Union at different levels of digitalization. As a result, it was found that the most advanced economies and the most developed countries have the highest level of deductibility of banking activity (related to clusters 2 and 1). As a higher level of economic development provides more opportunities for investment, Internet access and better education of the population. In addition, it can be argued that it is the countries from the first group in the near future will or will become leaders in the European market of banking services, and it is on them that they will need to be guided by the orientation of the development of the banking system. The results of empirical analysis, have shown that banking institutions understand the lack of prospects of activities without financial innovation. On the other hand, as the study showed, such activity is characterized by high-risk banks. The issue of safety of up-to-date financial transactions is extremely important for supervisors who can not at the moment agree on what measures to apply and implement in order to minimize the risks of financial transactions. The study empirically confirms and theoretically proves that it is important to understand and justify the basic principles of the future development of banks, to identify and develop measures to minimize the levels of financial risks associated with the implementation of financial innovations, as well as to simply understand and evaluate changes expected by users of banking services during the next 5 to 10 years. The results of the research can be useful for scientists, management of banking and other financial institutions, as well as for users of banking services.*

Keywords: banks, banking systems, financial innovations, information technologies, digitalization, financial innovations, Fintech companies, blockchain, online services.

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Introduction. Problem statement in general and its relation to important scientific or practical tasks. Approval in January 2018 of the Concept for the Development of the Digital Economy and Society of Ukraine for 2018-2020 showed the inevitable path of our state to the implementation of the latest information technologies in all spheres of life. Banking has always tried to keep up with the times and to actively use financial innovations in order to improve security and speed of customer service. However, modern innovations in the field of finance go beyond the traditional ideas which in the foreseeable future will radically change the banking systems of many countries. Therefore, the issues of the impact of modern innovations on the future of banking systems and the challenges that banks will meet in the coming years are becoming topical. To this end the development of information technologies in the banking systems of the EU countries was studied, a group of leading countries, technology and approaches to the development of banking systems available in these countries at present have been identified.

Literature Review. Many researchers and practitioners were engaged in the study of the influence of the information technology development on the way banking systems function. Most of them agree that banks are currently on the verge of major changes and transformations, but the end result of this process will be improving the quality of customer service and increasing their loyalty (Pousttchi, K. & Dehnert, M., 2018; Marinč, M., 2013). Ukrainian scientist T.M. Mayorova notes that «today the most successful innovations that are implemented by banks are related to changing approaches to customer service. Technologies and channels of services promotion are in the background as they solve only technical issues, not replacing personal approach to the client and trust on his part» (Mayorova, 2017). Brett King, the author of the bestseller «Banks 4.0 – Banking Everywhere, but not at a bank» and the founder of the MovenBank mobile application states: «When creating future financial services, it is worth refusing to make minor changes. In order to make a leap in the development, it is necessary to completely rethink the basic principles of activity, as Steve Jobs did with Apple or Amazon, has created an e-commerce market» (Global Banking Outlook, 2018).

At the same time, there are also works, where further work of banks is questioned at all. In particular, Bill Gates, back in 1994, said: «Banking is important, banks are not» (Report KMPG, 2017). A. Walker., in his book «Banking without banks», is quite sceptical about the future of banks due to the growing competition between them and FinTech companies (Walker A., 2014).

In addition to the current scientific discussion on the future of banks, a number of works can be found in the scientific literature, in which the impact of information technology on the banking systems of certain European Union countries was investigated (Japparova I. & Rupeika-Apoga R., 2017; Brandl B. & Hornuf L. 2017; Lustsik O, 2003; Yliluoma J., 2018; Erins I. & Erina J., 2013; Nitescu, D & Kazandzhieva-Yordanova, I., 2017). Taking into account the different levels of these countries development, the studies do not enable us to make conclusions and suggestions as to the future of European banks.

Singling out previously unresolved issues that are part of the general problem the article is devoted to. Taking into account the above, there is a need to analyze the digitalization level of banking systems of the European Union. To do this, it is necessary to study the main indicators characterizing the development of banking systems and the use of information technology in these countries. In addition, it is expedient to identify the main trends in the development of banks over the next few years by systematizing and analyzing statistical information and expert assessments of banking practitioners.

The aim of this article is to study the impact of modern information technology in the banking systems of the European Union countries and to identify future trends in the development of banks.

Methodology and research methods. The research was based on the hypothesis that the level of digitalization of banking activity is directly related to the level of economic development of countries, as a higher level of economic development provides more opportunities for investment, Internet access and better education of the population.

Given the different pace of informatization and the level of development of financial and banking systems in the countries of the European Union, it was assumed that the level of digitalization of their banking systems is different, and by this indicator, the countries can be divided into several groups. To do this, using cluster analysis we conducted our own research on the level of digitalization impact and the introduction of FinTech innovations in the banking activities of different countries.

To this end, three groups of indicators were used:

I. Indicators that directly reflect the level of digitalization of banking activities:

II Indicators that reflect the overall level of digitalization in the financial sector:

III Indicators of the overall development of information technology in the country, reflecting the opportunities and need for financial innovation.

Results. In order to carry out a cluster analysis of the level of digitalization in the banking systems of European countries, we selected the main indicators characterizing the development of banking systems and the use of information technologies in European countries:

I. Indicators that directly reflect the level of digitalization of banking activities:

– The share of people using online banking, in % of the total population aged 16-74 (data source – Eurostat);

– Availability of an account opened with a financial institution or through a mobile money service provider, as a percentage of the total population aged from 15 years on (source – World bank);

– the number of branches of commercial banks per 100 thousand adult population (source – World bank).

II Indicators that reflect the overall level of digitalization in the financial sector:

– The share of the population that carries out financial transactions via the Internet (at least one of the types of financial transactions – securities transactions, insurance, loans), in % of the total population (source – Eurostat);

– The volume of alternative online funding (through peer-to-peer and crowdfunding platforms), in dollars per capita (source – Cambridge Center for Alternative Finance).

III. Indicators of the overall development of information technology in the country reflecting the potential and need for financial innovation:

– Digital Inclusion (the share of the population using the Internet at least weekly), % of the total population (source – Eurostat);

– ICT sector share in GDP, % (source – Eurostat);

– The volume of e-commerce, in % of total sales turnover (source – Eurostat).

Due to the limited statistical base, the cluster analysis is carried out by 2016 indicators for 28 European countries (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom).

For the cluster analysis to be done, we will apply the software package Statistica and choose the k-means method of clustering, which enables us to clearly divide the studied countries into clusters.

As a result, 4 clusters were formed, the composition and values of their centroids, as well as the average values for the whole sample, are presented in Table 1.

In order to interpret clustering results, compare the obtained results with the Country Digital Readiness Score calculated by Cisco in seven sets of parameters: technological infrastructure, technology implementation, startup environment, human capital, corporate and public investment, ease of running business, basic needs satisfaction (Tae Yoo, Mary de Wysocki & Amanda Cumberland, 2018).

Thus, the countries with the highest Digital Readiness Score and readiness to implementation of financial innovations are included in the 2-nd cluster. In particular, the centroid of this cluster, by all the indicators included in the analysis, except for the number of branches of banks per 100,000 population,

substantially exceeds the similar values of the centroids of all other clusters as well as the averaged values of the indicators for the whole sample of the countries. Thus, the share of the population with electronic accounts in banking and other financial institutions is 99%, the share of online banking is more than 82%, while the share of other types of financial transactions made online is more than a third. In addition, the 2-nd cluster included countries that are leaders among European countries in terms of volumes of online financing through crowd-sharing and peer-to-peer platforms. The adequacy of the results of the clustering is confirmed by the Countries Digital Readiness Score, which is the highest for the 2-nd cluster countries. It is also worth noting that the 2-nd cluster countries are characterized by the lowest indicator value of the number of branches per 100 thousand population. This is explained by the fact that with the growth of volumes of banking and other financial transactions carried out online, the need for the physical presence of banking institutions and their representative offices is significantly reduced.

Countries of cluster 1 are characterized by a fairly high level of digitalization and the introduction of financial innovation. The values of centroids in most of the indicators for this cluster are higher than the average European ones, but they are significantly lower than those of the 2-nd cluster countries. It is worth noting that in the first cluster one can find countries that by Digital Readiness Score are ahead of even some 2-nd cluster countries (for example, Germany – 17.68). Indeed, according to the indicators of digital inclusion, the share of e-commerce, the share of ICT in GDP, that is, by the group of indicators of the overall development of information technology, the 1-st cluster countries have very high values. At the same time, the level of digitalization of the banking sector itself is low, as evidenced by the share of online banking – about 57%, and financial online transactions – 13%.

Only 2 countries out of the studied ones are included in the 3-d cluster, they are Romania and Bulgaria. They are characterized by both the lowest level of digitalization in general, and the use of information technology in the banking sector. The obtained results are also confirmed by Digital Readiness Score.

The most numerous is a group of countries included in the 4th cluster. The centroid values for the countries' indicators are lower than the average for the whole sample (for the indicator of the number of branches of banks they are, on the contrary, much higher, which corresponds to the economic content of the indicator in the context of the analysis of the digitization level). By the general level of digitalization (indicators of digital inclusion, the share of the population with electronic accounts, the share of e-commerce) and also according to the Digital Readiness Score the 4th cluster countries are close to the average European level. However, the introduction of financial innovations in their banking sector is low.

Summarizing the results of the empirical analysis, it can be argued that the countries with the most developed economies and the most developed countries have the highest level of banking activity digitalization (clusters 2 and 1), that is, the results of the analysis confirm the hypothesis we put forward. In addition, it can be stated that it is the countries of the first group that in the near future will be or will become leaders in the European market of banking services, and it will be these countries that Ukraine will need to be guided by while setting the benchmarks for the development of the banking system.

What exactly are the benchmarks to be put in the management and development of financial innovations in the market of banking services? To answer this question, we have investigated the current trends in IT technology development in the banking activities of the leading EU countries.

Table 1. Composition and centroids of clusters formed by the k-means method

Indicators	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Average by the sample
1	2	3	4	5	6
Financial transactions online	0,1289	0,3371	0,0200	0,0570	0,1475
ICT share in GDP	0,0454	0,0496	0,0449	0,0360	0,0430
Digital Inclusion	0,8267	0,9171	0,5700	0,7190	0,7925

Continued Table 1

1	2	3	4	5	6
The share of e-commerce	0,1944	0,1957	0,0550	0,1330	0,1629
Share of online banking	0,5689	0,8229	0,0450	0,3660	0,5225
Share of population with electronic accounts	0,9507	0,9903	0,6498	0,8778	0,9130
Branches of banks per 100 thousand population	26,8484	14,4587	38,1858	31,4573	26,2068
Alternative online funding	2,5044	18,1814	0,0000	0,2940	5,4554
Cluster Composition and Country Digital Readiness Score	Austria– 16,43; Belgium – 16,31; Czech Republic – 15,14; France – 16,98; Germany – 17,68; Ireland – 17,00; Latvia – no data; Luxembourg – no data; Malta – no data	Denmark – 17,27; Estonia – no data; Finland – 17,01; the Netherlands– 17,89; Norway– 17,38; Sweden – 17,58; the United Kingdom– 17,84	Bulgaria – 13,23; Romania– 13,34	Croatia – 14,09; Greece – 14,06; Hungary – 14,29; Italy – 14,11; Lithuania – н/д; Poland – 13,89; Portugal– 14,54; Slovakia – 14,29; Slovenia– н/д; Spain – 14,91	x
Conclusion on the level of implementation of financial innovations in banking activities	Above average	Very high	Very low	Below average	X

According to Eurostat research, 54% of consumers are active users of online banking.

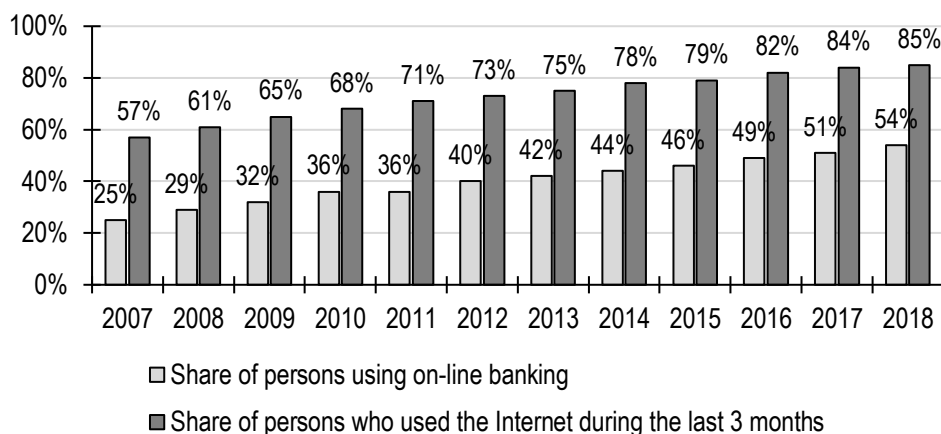


Figure1. Use of online banking in the EU countries (EU28) during 2007-2018, %

Source: Eurostat.

The Oracle Financial Services study showed that among banking services the most interesting online form is opening accounts (60%), payments and remittances (86%), consumer loans (68%), mortgage loans (62%) (Global Retail Banking Survey, 2018). These results show the readiness of banks' clients for innovations and changes in the service format.

In turn, according to the results of the study by Global Banking Outlook 2018, it is through the IT sphere that banks see opportunities for further growth, increase in customer base, increase in efficiency (Fig. 2).

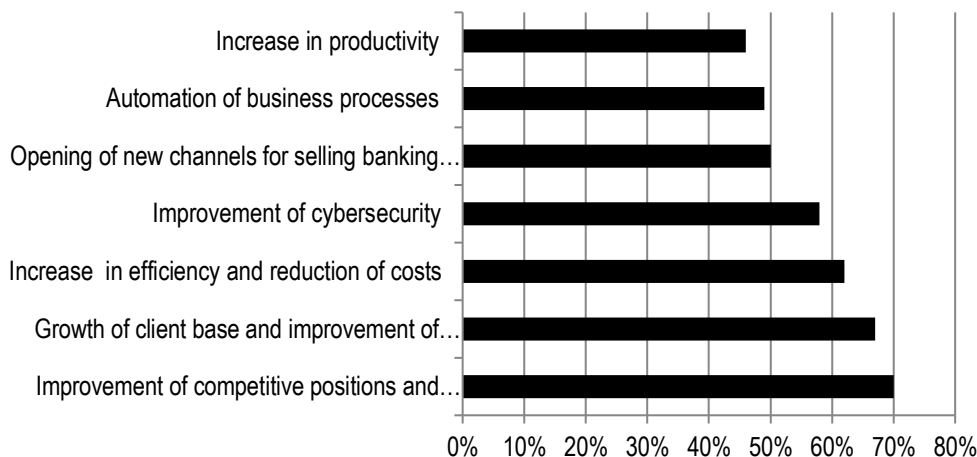


Figure 2. The main factors that encourage banks to invest in FinTech innovations over the next three years

Source Global banking outlook, 2018.

Currently, banks are most interested in innovations in the field of artificial intelligence, biometric authentication systems, cybersecurity technologies, API and robotization (Table 2).

Table 2. The most attractive innovations for banks

Type of innovation	Do not invest		Invest	
	... and I will not invest for the next 3 years	..., but I plan to invest over the next 3 years	..., but I plan to reduce investment over the next 3 years	... and plan to increase the investment over the next 3 years
Artificial Intelligence	0-20%	20-40%	40-60%	60-80%
Virtual reality	0-20%	20-40%	40-60%	60-80%
Blokchain	0-20%	20-40%	40-60%	60-80%
Cloudy technology	0-20%	20-40%	40-60%	60-80%
Cryptography / cybersecurity technologies	0-20%	20-40%	40-60%	60-80%
«Big data» technologies	0-20%	20-40%	40-60%	60-80%
Bioethical authentication systems	0-20%	20-40%	40-60%	60-80%
Internet of Things	0-20%	20-40%	40-60%	60-80%
Mobile technology	0-20%	20-40%	40-60%	60-80%
API	0-20%	20-40%	40-60%	60-80%
Robots-assistants and consultants	0-20%	20-40%	40-60%	60-80%
Robotization of business processes	0-20%	20-40%	40-60%	60-80%
Intelligent contracts	0-20%	20-40%	40-60%	60-80%

Notes: % survey respondents.

Source Global banking outlook, 2018.

Despite the banks' interest in introducing innovations into their own business, one should understand that this will require significant investment. The results of the Global Banking Outlook 2018 (Table 3) show that the main source of innovation is purchasing ready-made technology. The interest of banks in this option can be explained by the reduced risk in case of buying a finished and already tested product, rather than investing in just the idea in case of acquiring a company-developer or a partnership.

Table 3. Sources of investments for banks

The type of innovation	Sources of innovation			
	Acquisition of a company-developer	Own Developments	Partnership	Purchasing of Technology
Artificial Intelligence	0-20%	20-40%	40-60%	60-80%
Virtual reality	0-20%	20-40%	40-60%	60-80%
Blokchain	0-20%	20-40%	40-60%	60-80%
Cloudy technology	0-20%	20-40%	40-60%	60-80%
Cryptography / cybersecurity technologies	0-20%	20-40%	40-60%	60-80%
«Big data» technologies	0-20%	20-40%	40-60%	60-80%
Bioethical authentication systems	0-20%	20-40%	40-60%	60-80%
Internet of things	0-20%	20-40%	40-60%	60-80%
Mobile technology	0-20%	20-40%	40-60%	60-80%
API	0-20%	20-40%	40-60%	60-80%
Robots- assistants and consultants	0-20%	20-40%	40-60%	60-80%
Robotization of business processes	0-20%	20-40%	40-60%	60-80%
Intelligent contracts	0-20%	20-40%	40-60%	60-80%

0-20%
 20-40%
 40-60%
 60-80%

Note % survey respondents.
Source Global banking outlook, 2018.

Interestingly, the most popular innovations in terms of own developments are cybersecurity, «big data» and mobile banking technologies. If in modern conditions mobile banking is a prerequisite for the development of the bank and so most banks have a dedicated IT department that deals with its maintenance and modernization, or they use outsourcing, the choice of the other two options rather shows banks' unwillingness to reveal customers' data and internal business processes for IT companies. At the same time, in our opinion, there is a danger here to the banks themselves. Having mastered the basic digital services, the main task of banks at the moment is to deepen digital technologies and to maximally approximate them to the needs of customers. A client wants to see a product that is as simple and convenient as possible at every stage of its life. Unfortunately, internal resources of banking institutions do not always allow processing information collected through basic digital services, analyze and build on its basis a new product that not only responds to the present but also predicts future customer needs. Therefore, cooperation between banks and IT companies is inevitable. According to Gary Pag, Vice president and head of the marketing department at Oracle Financial Services: «The end result of this collaboration is better experience of consumers in their use of financial services, a higher percentage of customer retention and creation of banking cooperation, which will lead to a long-term loyalty and all the penetrating delivery of services during Cycle Financial Life» (Global Retail Banking Survey, 2018).

The results of another study show that, at the moment, banks practically do not cooperate with FinTech companies, although they understand that in the near future this will become a prerequisite for further development (Figure 3)

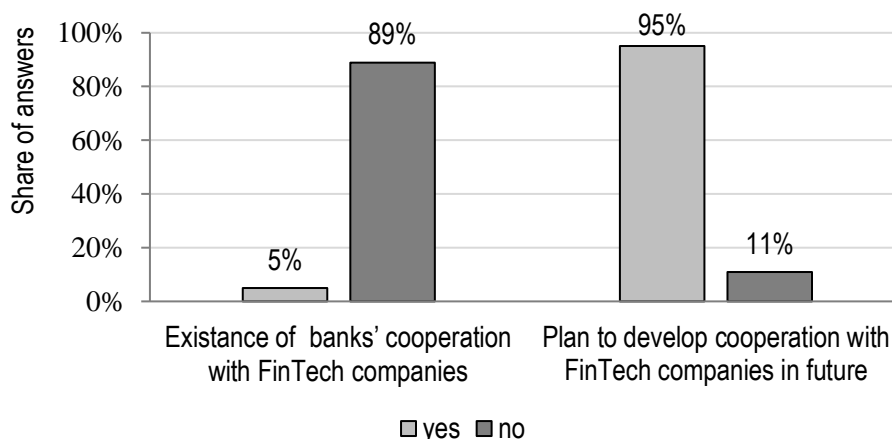


Figure 3. Cooperation of banks with FinTech companies

Source: Statista.

Based on the above-mentioned results of the research of the opinions of banking analysts and top managers, it is possible to draw conclusions about the understanding of real customer requests and the desire of banks to upgrade and change.

Conclusions. The next 5-10 years will be a test period for the banking systems of many countries. The banks' future will depend on how much they will be ready to modernize and sometimes even fundamentally change the principles of organization of their own activities.

The conducted cluster analysis confirmed the hypothesis advanced at the beginning of the study, which suggested that the level of digitalization of banking activity is directly related to the level of economic development of countries. The obtained results of the study allowed to group the countries of the European Union according to different levels of their digitalization. This made it possible for us to conclude that the countries with the most developed economies and the most developed countries have the highest level of banking activity digitalization too (clusters 2 and 1), as a higher level of economic development provides more opportunities for investment, Internet access and better education of the population. In addition, it can be stated that it is the countries of the first group that in the near future will be or will become leaders in the European market of banking services, and it will be these countries that Ukraine will need to be guided by while setting the benchmarks for the development of the banking system.

The analysis of the modern trends of IT development in the countries of the European Union showed the mutual readiness of both clients and management of banks to the fundamental changes in the process of service. Artificial intelligence, biometric authentication systems, APIs, «big data» technology provide an opportunity to develop a completely new approach to banking. Summarizing all of the above, we can identify the main trends of banking business in the next 5 years:

1. Changing the format of banking services organization. The traditional banking branch is becoming inefficient in the context of the rapid development of online payments. Most of both overseas and domestic banks are beginning to reduce the network of their own branches. According to research conducted by the US scientists in 2014-2016 only 3% of today's number of physical branches of banks will remain by 2025 which will conduct explanatory work for clients, who for some reason can not or do not want to use Internet banking. At the same time, secondary functions that are aimed at building confidence, support for a positive reputation of the bank, providing more detailed information to customers as well as indirect sale of banking products will come to the fore.

2. Changing the format of competition in the market of banking services. By the global financial crisis of 2008, banks had been leaders in introducing innovations. However, the problems they were encountering during and after the crisis have changed the goals of their activities. For almost a decade, the main efforts of banks have been aimed at increasing capitalization, while the introduction of innovation has fallen into the background.

During this period of time, with the active development of information technology, new competitors emerged for banks to compete with – technology companies, social networks, online stores, restaurants, etc. These companies invest in developing and starting up their own financial services to better serve their clients. For example, more than 10% of Starbucks revenue comes from mobile financial services, Amazon launches a mobile payment service, Uber has announced plans to open accounts for its drivers, and through the purchasing function introduced to the Chinese messenger WeChat, you can pay for goods and services of more than 10 million companies (Krasnov, 2017).

At present, banks have fairly stable positions compared to FinTech companies, which are based mainly on the confidence that has been formed over the years. Supervision by central banks, the availability of real branches, and the experience of using banking services is what builds confidence in banks and encourages customers to conduct financial transactions offline or online through a bank. At the same time, FinTech companies are quite innovative, highly loyal to customers and quickly adapt to change. . The positive experience of using their services will gradually increase the level of trust and the number of transactions carried out through their financial services. For example, if in 2015 the share of FinTech companies in making money transfers and payments was 15%, in 2017 it increased to 50%. 65% of consumers who conducted payment transactions through the services of FinTech companies, were satisfied and in the future plan to continue cooperation with them. These figures are characteristic of advanced economies. For developing countries, the figures are lower, but they are quite vividly indicative of how the retail segment of the banking business is slowly moving towards FinTech companies.

In the corporate banking business, the situation is more stable. Taking into account volumes and amounts of payment transactions, legal entities mainly cooperate only with banks. However, already now banking institutions should pay the maximum attention to this segment, in particular, to strengthen the relationship with corporate clients through differentiated multi-channel customer service, through development of special platforms for banking products, differentiated according to the needs of customers, through building an efficient system of customer data analysis, and improving service and satisfaction of their clients needs..

3. Changing monitoring systems in the banking market. Considering the above mentioned, it should be noted that financial technology is now developing much faster than the system of overseeing it. Activities of banking institutions are regulated by central banks while conducting payment transactions through the financial services of FinTech companies is not controlled from the outside. The innovative blockchain technology is partly helping to resolve this issue, but no country has officially recognized this monitoring system. In addition, in the presently presented format, the possibilities of blockchain are very limited – several dozen operations in one second. In order for blockchain to work efficiently, it is necessary to create a powerful nano processor, however, according to scientists, it will happen no earlier than in five to seven years. And then the processes of blockchain will begin to develop very quickly.

In our opinion, the active development of FinTech companies and blockchain technologies, apart from their new opportunities and potential benefits, creates certain risks and dangers, both for users and for the financial system as a whole. First of all, these tools can be successfully used for money laundering and terrorist financing. Secondly, investing money in FinTech companies and cryptocurrencies creates potential risks for depositors (investors) about returning their money and there are no state mechanisms of their guarantee. To sum up, the above risks present the need for an effective system of supervision and

regulation, both at the state and international level, which would be in line with the pace of information technology development.

Thus, the development of information technology has a significant impact on the activities of each individual bank and the banking system as a whole. The future of banks as financial intermediaries in the market will depend on how much they will be ready to implement financial innovations in their operations and to cooperate with FinTech companies.

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Вплив фінансових інновацій на розвиток банківських систем країн ЄС

Ця стаття узагальнює аргументи та контраргументи в межах наукової дискусії з питань визначення пріоритетних напрямів розвитку банківських систем, сучасних проблем і перспектив впровадження новітніх інформаційних технологій у процес розвитку банківських послуг. Його темп та сучасні тренди потребують повноцінного наукового обґрунтування. Відповідно, метою проведеного дослідження є визначення впливу фінансових інновацій на банківські системи країн Європейського Союзу та подальші перспективи їх розвитку. З цієї метою, перш за все було запропоновано гіпотезу, що рівень діджиталізації банківської діяльності пов'язаний із рівнем розвитку економіки країни і саме він у майбутньому визначатиме розвиток банківських систем цих країн. Для підтвердження даної гіпотези було проведено відповідне емпіричне дослідження. Систематизація літературних джерел та підхід до вирішення зазначеної проблеми засвідчила, що у наукових джерелах в основному здійснюється аналіз впливу фінансових інновацій на банківські системи окремих країн Європейського Союзу. Враховуючи різний рівень розвитку цих країн, дані дослідження не дають змогу зробити висновки та пропозиції стосовно того яке майбутнє чекає європейські банки. Електронний банкінг, створення великої кількості фінтехкомпаній, криптовалюта, блокчейн – радикально змінюють класичний банківський бізнес. Ці зміни набирають обертів і майбутнє банківської системи зараз дуже неоднозначне. Чи зможуть класичні банки ефективно функціонувати чи на їхнє місце прийдуть нові фінансові компанії? Що потрібно робити керівництву банку, щоб закласти основи для його успішного функціонування, в умовах стрімкого розвитку інформаційних технологій? Хто і як буде регулювати глобальні фінансові ринки? Немає однозначних відповідей на ці питання. Методичним інструментарієм проведеного дослідження стали кластерний метод, методи систематизації, групування, порівняння, експертних оцінок. Періодом дослідження обрано 2015-2018 роки, які показують найбільш стрімку динаміку зміни процесів обслуговування клієнтів банків із оффлайн у онлайн сферу. Окрім того, даний період часу характеризується стрімким розвитком фінансових інновацій, що кардинально міняють підходи до традиційної банківської діяльності. В статті представлено результати кластерного аналізу, результати якого дозволили згрупувати країни Європейського Союзу за різним рівнем діджиталізації. Завдяки цьому було виявлено, що країни з найбільш розвинутою економікою та найбільш розвинені країни мають і найбільший рівень діджиталізації банківської діяльності (відносяться до кластерів 2 та 1). Оскільки вищий рівень економічного розвитку дає більше можливостей для вкладення коштів, доступності інтернету і кращої освіти населення. Окрім того, можна стверджувати про те, що саме країни з першої групи у найближчій перспективі будуть або стануть лідерами європейського ринку банківських послуг і саме на них потрібно буде орієнтуватись Україні, у постановці орієнтирів розвитку банківської системи. Результати емпіричного аналізу, засвідчили, що банківські установи розуміють безперспективність діяльності без фінансових інновацій. З іншого боку, як показало дослідження, така діяльність характеризується для банків підвищеним ризиком. Питання безпеки новітніх фінансових операцій є надзвичайно важливим для наглядових органів, які не можуть на даний момент часу узгодити які заходи застосовувати і впроваджувати з метою мінімізації ризиків фінансових операцій. Дослідження емпірично підтверджує та теоретично доводить, що важливо розуміти та обґрунтовувати основні принципи майбутнього розвитку банків, визначати та розробляти заходи для мінімізації рівнів фінансових ризиків, пов'язаних з впровадженням фінансових інновацій, а також просто розуміти і оцінювати зміни, які очікують користувачів банківських послуг протягом наступних 5-10 років. Результати проведеного дослідження можуть бути корисними для науковців, менеджменту банківських та інших фінансових установ, а також просто для користувачів банківських послуг.

Ключові слова: банки, банківські системи, інформаційні технології, діджиталізація, фінансові інновації, фінтех компанії, блокчейн, онлайн-сервіси.

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