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CURRENT STAGE OF FORMATION OF THE FINANCIAL INTERMEDIATION ECOSYSTEM IN THE CONTEXT OF DIGITALIZATION

The spread of digital technologies has led to a new stage in the transformation of financial systems around the world and has become a trigger for innovative changes in all areas of financial intermediation. The purpose of this article is to analyze the preconditions and trends, identify the advantages, opportunities and risks of digital transformation of financial intermediation in the face of increasing competition and intensifying disintermediation, including in Ukraine. Analytical and systemic approaches, methods of comparative and factor analysis were used to achieve the article goals. The

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most important research results that have theoretical significance include the substantiation of conceptual approaches to the formation of a common ecosystem of financial intermediation and an insurance ecosystem based on the integration of digital technologies. It has been proved that, despite the spread of digitalization, for financial intermediaries is important the compliance with the principles of customer orientation, innovation, efficiency and effectiveness, security and organizational flexibility. The digital trends of financial intermediation in relation to its main functions have been identified, new types of risks associated with the spread of FinTech and the possible consequences of their impact have been identified. The features of the institutional structure of financial intermediation and implementation of financial innovations in Ukraine have been described, the regulatory policy of the National Bank of Ukraine, the innovative activity of FinTech industry in the context of the spread of digitalization are presented, which can be useful in terms of studying foreign experience. The results of this study can serve as a basis for understanding key trends, conceptual approaches to changing business models and formation of financial intermediation ecosystems, directions and opportunities for the introduction of innovative financial technologies for the correct orientation and response to dynamic changes in the financial services market.

Keywords: *digital economy, digitalization, financial innovation, financial intermediation, digital ecosystem.*

1. INTRODUCTION

Opportunities to achieve economic growth and improve the well-being of society are determined by the degree of development of financial intermediation. After the last financial crisis, the trend of forming a single financial space has made the orientation towards convergence of interests of financial intermediaries in terms of financial stability, efficiency and profitability. At the same time, financial intermediaries are facing new challenges regarding the ability to meet the requirements of the EU Payment Services Directive (PSD2), introduction of financial innovations and implementation of modern digital technologies into their own activities, and maintaining competitiveness in the context of growing disintermediation in the financial services market, where the major competitors to traditional financial institutions are high-tech companies (BigTech and FinTech startups) with financial services platforms. FinTech companies have rapidly entered the financial services industry and are opening up large-scale, more transparent access to them.

They are flexible to the requirements and preferences of consumers and spur increased investment in this ecosystem. In these circumstances, there is a need to explore the transformational processes of financial intermediation in the context of spread of digital technologies.

Considering the above, the subject of the research is the processes of financial intermediation transformation in the context of digitalization.

The main goal of presented research is to analyze the prerequisites and trends, identify the benefits, opportunities and risks of digital transformation of financial intermediation in a dynamic growth and increased impact of the FinTech market, including one in Ukraine.

The article is divided into five chapters. The second chapter contains an overview of current literature focused on theory and practice of financial intermediation transformation under the influence of digitalization. The third chapter presents the methods used in the research. In the fourth chapter the authors introduce the results of their research and answer the research questions, namely identification of digital trends, formation of a conceptual approach to building a financial intermediation ecosystem based on integration of digital technologies, identification the transformational aspects of non-banking financial institutions activities, disclosure the potential of digital technologies for investment management, analysis the emergence of new risks of financial intermediation, assessment of financial intermediation processes in Ukraine. In conclusion the directions for further researches concerning construction of digital ecosystems, forecasting economic and social impacts, optimization of risks of financial intermediation in the conditions of digitalization are defined.

2. LITERATURE REVIEW

The transformation of financial intermediation in the context of spread of digitalization nowadays is considered in terms of various aspects. Gomber and ect. (2017), Martinčević and ect. (2020) emphasize that the financial intermediation is undergoing radical changes and requires innovative financial solutions from traditional intermediaries to increase profitability and gain a competitive advantage in the market. From the standpoint of activating progressive changes, systemic characteristics of innovations and models of technology diffusion Omarini (2017), Bunea and ect. (2018), Pousttchi and ect. (2018), Wonglimpiyarat (2019) analyzed digitalization processes in the banking sector, in the insurance – Volosovich (2016), Braun and ect. (2017), Stöckli and ect. (2018), Bohn (2018), in the activities

of other financial intermediaries – Chambers (2019), Meyer (2020). In the context of changing the institutional structure of financial intermediation Frost and ect. (2019), Stulz (2019), Tanda and ect. (2019) studied the FinTech and BigTech companies and proved their advantages over traditional financial intermediaries, especially in countries where the banking system is uncompetitive. Saal and ect. (2017), Hommel and ect. (2016), Bican (2020) investigated the issues of increasing competition and noted the trend of convergence of financial services market participants and the formation of a new type of partnership. Regional features of digital transformation of financial services are considered by Creehan and ect. (2017), Dorfleitner and ect. (2017), Demertzis and ect. (2018), and ect. (2018), which indicated that the preconditions for the spread of FinTech were the dominance of large banks and the inability to access financial services, and the advantages – the expansion of ways to provide them, as well as the desire of regulators to meet current trends. The impact of digital technologies on financial stability, increasing the level of financial inclusion, protecting the interests of customers and strengthening trust in financial intermediaries was assessed by Elsinger and ect. (2018), Karlan and ect. (2016), Izaguirre and ect. (2016), Tsai (2017).

Despite a wide range of studies, they have not yet become systematic, therefore, we provide a common understanding of key trends, conceptual approaches to changing business models and the formation of financial intermediation ecosystems, directions and opportunities for the introduction of innovative financial technologies to properly target and respond to dynamic changes in the financial services market.

3. METHODS OF RESEARCH

Considering the above mentioned objective, the following research questions were determined: 1) what trends are formed in the financial services market in the context of digitalization; 2) what is the essence of the financial intermediation ecosystem, the characteristic features of its functional structure; 3) how the activities of non-banking financial institutions are transformed in the new ecosystem of financial intermediation; 4) how the business models of institutional investors are changing due to the introduction of digital technologies; 5) what the risks emergence with the spread of FinTech, and what are the consequences of their impact on financial intermediation; 6) what is the formation of an ecosystem of financial intermediation in Ukraine under the influence of digitalization.

The theoretical and methodological basis of the study is a dialectical approach to studying the patterns of formation of digital trends that create the preconditions

and set the directions for the innovative development of financial intermediation. The basic principles of the scientific methodology for studying the phenomenon of innovative financial technologies and digitalization processes are used. General scientific empirical and theoretical methods of system analysis and concretization are used to determine the functional essence and structure of the ecosystem of financial intermediation and insurance ecosystem, identify the content of new competencies that financial intermediaries acquire within such ecosystems, and identify the features of digitalization of financial activities. Methods of comparative and factor analysis, expert assessments are used to identify the potential impact of digital technologies on insurance business, investment management, pension funds and credit unions. Methods of observation, generalization and detailing are used to identify a system of new risks associated with cyber threats, alternative data used in making investment decisions, spread of FinTech and the potential consequences of their impact on financial intermediation.

The empirical basis of the research is consisted of analytical reviews, specialized portals, expert opinions, scientific articles, as well as research results of international analytical agencies, financial institutions, central banks and regulators.

4. RESULTS

4.1 Digital trends in financial intermediation

Factor analysis of the features of financial intermediation digital transformation is not possible without clear understanding of current global trends of spreading and increasing impact of FinTech. Developing modern FinTech solutions is based on the functionality of digital technologies that open up new opportunities for channels of access and promotion of financial products and services, enhancing their inclusion, simplifying and accelerating business processes, reducing transaction costs, risks etc. According to the implementation of FinTech solutions and today's market demand for them, despite the change in their system of mutual positioning and priority, we can see sustainability of positions of the main digital trends during 2017-2019.

In particular, sustainable trends include: 1) increasing the accessibility of financial services through the transition from multichannel system to omni-channel one, where mobile channels and, consequently, mobile wallet, payment and money services are increasingly prevalent. This changes customers' behavioral habits and payment competencies toward contactless payments, mobile and digital banking;

2) chatbots, machine learning, artificial intelligence and Big Data analytics — embedding these technologies and / or implementing them through operational, analytical, management tasks allows managing capital, loyalty programs and personalized banking services and investment models on a new level, transforming business models, making payments and money transfers, credit scoring, financial trading and monitoring, compliance control, etc; 3) risk optimization and increased security in situations of cyber threats.

A revolutionary trend is certainly the emergence of cryptocurrencies, their rapid expansion in the financial market and formation of its separate segment (cryptocurrency market), the existence of which causes ambiguous position / debate both in terms of subject matter and legitimacy. Along with cryptocurrencies, digital financial assets have emerged as assets in electronic form created by cryptographic means, which also include tokens, stablecoins, and cryptogoods. In this aspect, Initial Coin Offering (ICO) is gaining ground — a mechanism for attracting funding to new technology projects and startups in the form of issuing and selling new cryptocurrencies to market participants or, more simply, initial coin placement. Blockchain technology is associated with cryptocurrencies, but not just as a technology of their creation. Blockchain has recently opened up new opportunities in many areas thanks to its uniqueness in storing, accessing and processing data.

Trends that have a restorative or aggravating effect for financial intermediation should include: 1) integration processes to strengthen market positions that focus on collaboration according three vectors – FinTech, social networks and the Internet of Things (IoT). It should be noted that this is facilitated by the adoption of the PSD2 (Revised Payment Service Directive), which was not unambiguously adopted at the beginning, but over time it proved its expediency for the construction of a single ecosystem of open financial services, electronic transactions security in financial flows of marketplaces. In this regard, digital platforms and ecosystems, Open API (Application Programming Interface) and Open Banking are becoming key elements; 2) renewal or entry into a new stage of development of the insurance market at the expense of InsurTech; 3) development of the RegTech direction in response to increased regulatory pressure and significant financial penalties, and the introduction of SupTech (Supervisory Technology) to support the modernization of data-based financial supervision. RegTech's effects are expected to optimize regulations, reduce reporting load and errors in reports, reduce compliance costs, etc. According to the functionality, today there are RegTech solutions that provide: compliance with regulatory requirements; risk management, when combined with the identification of market risks, it is allowed to counter cyber risks and insider behavior of employees; prompt, real-time transaction monitoring to prevent fraud, abuse, money laundering; identity management. But the success of such decisions

depends on collaboration between regulators, financial intermediaries, experts and high-tech IT companies and startups.

Therefore, these digital trends create the preconditions and set directions for innovative development of financial intermediation, as each of them tries to make the most of the opportunities of digital technologies.

4.2 Formation of a financial intermediation ecosystem based on digital integration

There are several approaches to interpreting the concept of "ecosystem", in particular: a set of interacting participants; a site offering integrated products and services able to meet a wide range of customer needs; an organization that operates on an innovative basis of development. The main prerequisites for creating an ecosystem are the need for customers to receive quality goods and services using digital distribution channels; development of technologies that enable effective interaction with clients; the willingness of today's generation to open up access to personal data in order to obtain the optimum product offer through personalized communication channels. An ecosystem allows to apply innovative ways of interaction to a range of stakeholders. So, within the ecosystem, there are financial intermediaries, consumers of financial services and regulatory organizations.

In order to function effectively within the ecosystem, financial intermediaries use innovative technologies to acquire competencies (Table 1).

Table 1

ACQUIRING NEW ECONOMIC COMPETENCES BY FINANCIAL INTERMEDIARIES

Properties	**Transformational prerequisites**	**Innovative technologies**
Innovative development strategy	Formation of an innovation-oriented organizational structure; creation of a "center of innovative decisions", creation of innovative teams	MVP concept (minimum viable product)
Effective management	Creating adaptive conditions for organization of activity; introduction of a systematic approach to improving the efficiency of business processes; enhancing internal communication and corporate motivation	Lean management; a systematic approach to applying the Agile and Lean methodology
Innovative management of integration processes	Implementation of flexible IT architecture and effective interaction with ecosystem participants	API and microservice architecture
Interactive interaction	Promoting systematic development of digital channels of interactive interaction with ecosystem participants through the use of psychological methods of communication in a behavioral economy	Big Data, Artificial intelligence (AI), Cloud Technology

Source: Developed by the author

The financial intermediation ecosystem is represented by a group of participants. The center of the ecosystem can be a financial intermediary, which has formed a broad client base on a high level of trust; is willing to accept adaptation changes in the organization of business processes; has formed a strong and well-known financial services brand. The ecosystem also includes consumers of financial services, other financial intermediaries, partners and regulators. All participants are united by means of digital technologies with mandatory acceptance and observance of uniform norms and rules of ecosystem functioning. An important criterion for the inclusion of financial intermediaries in the ecosystem is the introduction of modern innovative technological approaches. The functioning of financial intermediaries ecosystems is supported by digital technologies.

Considering that banks are the main participant in the financial services market, they are quite active in digitalizing business processes, implementing financial

innovations (Bunea, 2018), and therefore strive and are fully capable of acting as centers of the financial intermediation ecosystem, uniting other participants around themselves on the basis of a strategic alliance. At the same time, FinTech companies demonstrate the highest level of willingness to innovate in order to gain synergies from the combination of financial services and customer satisfaction. This makes it possible for these financial intermediaries to get ecosystem center functions, which is quite realistic taking into account the recent tendencies of their integration. But only time will tell which model of the ecosystem become dominant.

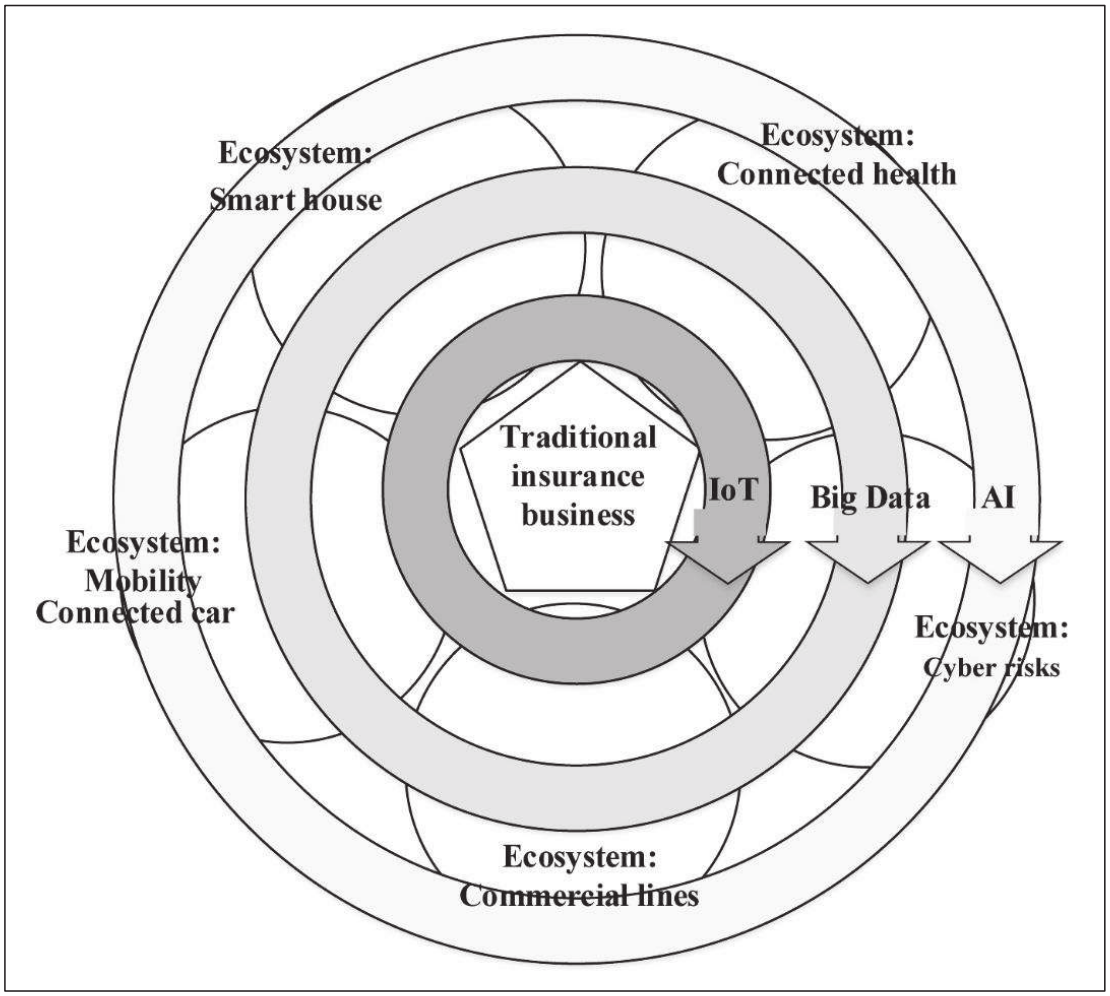
4.3 Non-banking financial institutions in the financial intermediation ecosystem

The formation of the financial intermediation ecosystem cannot be considered without participation in it non-bank financial institutions, the most active among them are credit unions, insurance companies, and pension funds. They are now also paying attention and taking the first steps in implementing digital technologies.

Traditional insurance companies, with their conservatism about introducing digital-based financial innovations, are actively competing with InsurTech companies which develop insurance products and services, relying on big data analytics to evaluate, forecast and optimize risks (Bohn, 2018). Under these circumstances, insurance companies begin to transform their business into the following models:1) digital restructuring of their own traditional business models and business processes, entry into new segments; 2) response to cyberspace, the emergence of new crypto-assets and cyber- risks and, accordingly, the development of approaches to their insurance; 3) formation of an integral ecosystem of insurance business. Such an ecosystem, in our opinion, is formed by the integration of local insurance ecosystems – Connected health, Smart house, Mobility Connected car, Commercial lines, Cyber risks. At the same time, the vector of insurance priorities is changing from risk protection to their forecasting and prevention based on the analysis of large amounts of data. The technological basis for the functioning and interaction within the ecosystem is provided by digital technologies Blockchain, Internet of Things (IoT), Big Data, Intelligence Technologies (AI) (Graph 1).

Graph 1

INSURANCE BUSINESS TRANSFORMATION



Source: created by the authors.

Indicated technologies are cross-cutting and provide: 1) Big Data — financial analytics based on large amounts of information for market segmentation and personalization, fraud reduction, detection of new drivers and improvement of claims settlement processes; 2) Blockchain — data sharing, cost savings, increased trust in online products, digital policies, smart contracts and claims management; 3) AI — insurance process automation, portfolio management, credit analysis, machine training for fraud prevention, underwriting and loss management, risk assessment; 4) IoT — individualization and inclusion in medical, personal and auto insurance

with new sources of information (biometric monitoring tools, object control sensors and geolocation systems). Pantielieieva (2019, p.149) provides a generalization of the adoption of digital technologies by the global insurance giants. Along with the positive effects of the spread of digitalization processes, it creates new risks – cyber risks and a new segment – cyber risk insurance. Today the issues of the essential nature of this risk, standardization, amount of coverage, cost, taxation, the procedure for conducting an insurance examination.

So, the insurance industry nowadays, especially in countries where the insurance market is in a state of unstable dynamics of development and adaptation to the European and world markets, now has a chance of revival or a rapid breakthrough.

Prospects for the introduction of digital technologies are also seen by pension funds (Mizel, 2019). Digital technologies and innovative PenTech solutions have significant potential for modernizing pension systems, trust to most of which have recently been shaken (Table 2). Today, the innovation leaders are the US, the UK, Canada, the Netherlands, Australia, and Spain.

Table 2

SUPPORTING DIGITAL TRENDS BY PENSION FUNDS

Trend	Opportunities
Blockchain	optimization of internal management processes of institutional and non-state pension funds, transparency of financial transactions, guarantee of purposeful use, security and quality of administration and services, free and transparent transition between funds, synchronization of information regarding clients and funds, protection of personal data
Big Data	segmentation of participants, optimization of public service delivery, taking into account the migration of personal data, increasing the efficiency of funds and interaction with citizens; calculation of pensions based on individual account analysis; determining the status of citizens' rights with respect to tax benefits, social support and other rights; personalization and flexibility; analytics and risk assessment, etc.
Artificial Intelligence Technologies, AI	chatbots, robot consultants, dashboards, administrative asset management functions, pension strategy risk assessment models, analytics and typology of bankruptcy risk funds

Source: Based on Mizel, Raetz & Kuchaev (2019), OECD (2017), PWC (2018)

Specialized PenTech solutions offer building personalized pension and individual communication strategies, ensuring flexibility of proposals and freedom of choice for fund participants, reducing administrative costs due to decentralization, etc. At the same time, reliable protection against cyber threats is needed to prevent the loss of confidential data and funds.

The popularity of credit unions is actively growing due to the non-commercial nature of activities and cooperation between all participants in these economic relations. Credit unions see the possibilities of blockchain and AI technology (Meyer, 2020). Through these technologies, they expect to receive the following digital dividends and take the following steps: 1) improve access to financial services, risk management, compliance, data security, and identity management; 2) improve the quality and efficiency of contractual processes through automatic verification of transactions; 3) invest in blockchain startups to develop digital credentials for credit union members and ensure reliable identification; 4) cooperate with leading IT companies and with each other to create their own network of free access to shared financial resources and new services.

The implantation of AI will allow to: 1) recognize the needs for specific services and form a personal offer; 2) improve the quality of call centers by recognizing behavior, analyzing records and emails for further typing and clustering customers, as well as identifying common problems; 3) improve the effectiveness of compliance monitoring and combating fraud.

Thus, financial intermediaries are transforming their own business models and building new ecosystems based on digital technologies to increase business performance and competitiveness in the financial services market.

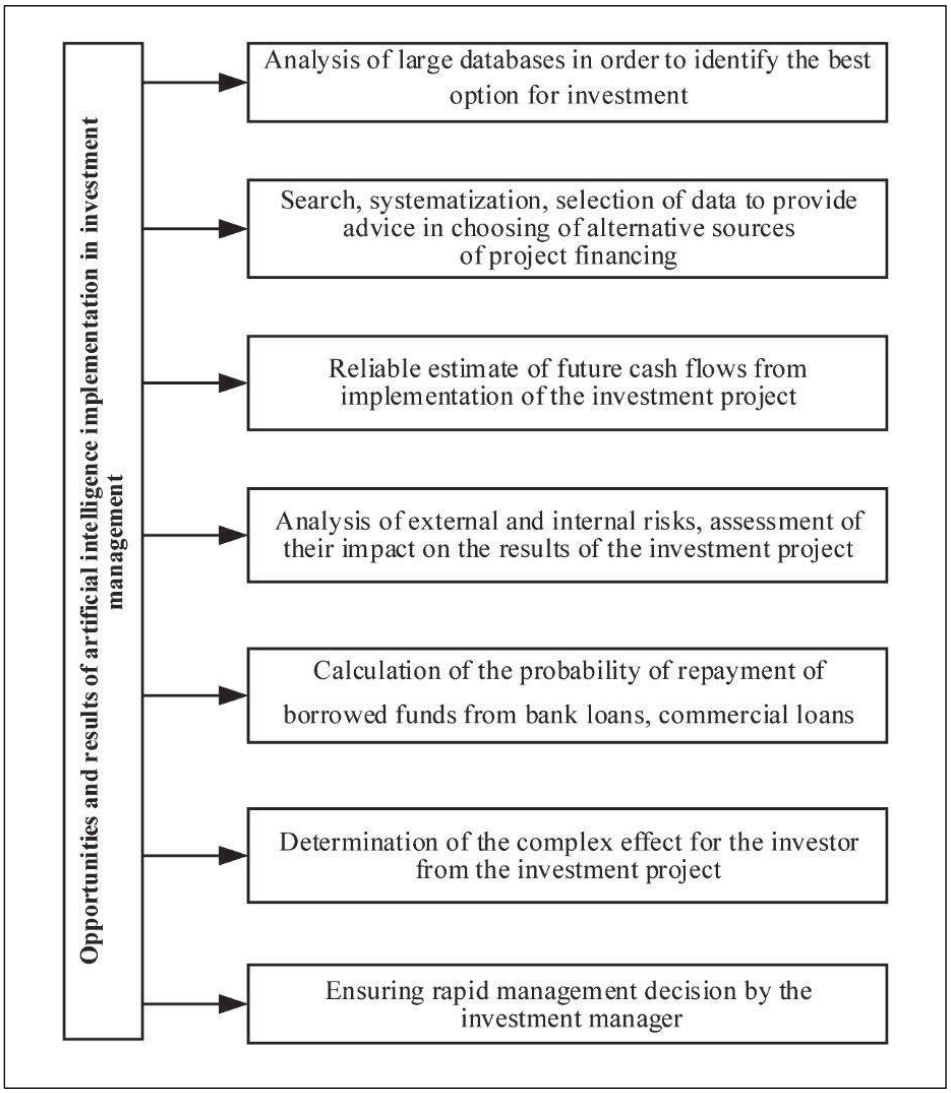
4.4 Investments: functional orientation of artificial intelligence and alternative data for financial intermediaries

Among the numerous functions of financial intermediaries are those related to investments, in particular, ensuring their liquidity, assessing economic risks to reduce uncertainty, transforming savings, developing financial instruments, taking into account investment preferences, etc. The prerequisites to search for financial intermediaries for new FinTech solutions are an increase in the amount of relevant information on threats to the existence and prospects of business development, high flexibility of making suboptimal decisions due to lack of time, as a result of the high dynamism of the environment. At the same time, financial intermediaries are seeking guarantees for sustainable business development and new product

creation, that implies inductive thinking and reengineering methodologies in strategic management, business process modeling, and imitation models to evaluate efficiency and avoid risks. In this respect, Artificial Intelligence (AI) (Fiorentino, 2019; EMERJ, 2017) opens up new opportunities due to its ability to continuously search, organize, evaluate, and combine arrays of market information (Graph 2).

Graph 2

AI POTENTIAL OPPORTUNITIES IN INVESTMENT MANAGEMENT



Source: Based on Everest (2018)

Today, AI tools are implemented into the long-term asset portfolio management process to improve investment practices and minimize risks. The neural network-based Style Detector Array concept with learning attributes identifies investment styles of managers based on trading behavior. It is also capable of monitoring and analyzing investment styles in real time, creating a single, high-precision database that, based on data aggregation, encompasses the management strategies of various asset management companies, that enhances their discipline and responsibility, creates synergistic effects for the benefit of improving fund and risk management (Sasaki and ect., 2018).

The largest investment fund in Europe, APG, is also changing its business model by implementing AI to increase operational efficiency and profitability, which is achieved through a comprehensive automatic real-time forecast for a wide range of assets based on the use of a significant amount of data, including not only market data, and machine learning. The significance of the potential effects of obtaining high profitability, structure optimization and management costs opposes to the need of significant investments in AI. Failure to achieve balance is a threat of losing positions or even leaving the market, where quantitative investment approaches and quantum strategies based on AI have taken the lead. The share of quantum investments in the market was 29%, which is equal to the share of individual investors, and the average return over the last five years has been 5.1% compared to 4.3% of manual trade. Quantum investment growth has been driven by changes in the investment environment — increased regulatory oversight, increased data volumes and the introduction of new technologies for their collection.

Traditional investment management approaches based on structured data and quantitative methods are being replaced by the formation of investment decisions, relying on alternative (big) data, the source of which are news feeds, social networks, metadata, satellite and geolocation data and new methods of their processing. Along with increasing the reliability and speed of obtaining the assessment of investment decision, some risks are created (Table. 3).

Table 3

INVESTORS' RISK SYSTEM REGARDING ALTERNATIVE DATA IN MAKING INVESTMENT DECISIONS

Kind of risk	Characteristics
Data risks	includes the following risks: origin of data, accuracy and reliability, confidentiality, material non-public information
Model risk	depends on the potential of influencing of a new data source and their incorrect including it into the investment model
Normative risk	the desire to use alternative data leads to a change in investment policy and processes, which does not preclude a breach of existing regulatory rules due to lack of practice and new ones formed
Strategic positioning risk	determined with the position of an investor as for its readiness to update investment processes through the use of alternative data (innovator, early follower, early or late majority supporters), which determines its ability to achieve information advantage or loss relative to competitors
Reputational risk	depends on the refusal to use alternative data to make investment decisions, which leads to weakening of innovation activity and competitive position, as a consequence — a decline in confidence, loss of profitability, deterioration of business reputation

Source: own development

Thus, the introduction of AI, machine learning, alternative data changes the investment landscape, eliminates the dependence of institutional investors on individual strategies of investment professionals who do not have quantitative confirmation of their quality, increases the efficiency of the investment process and responsibility for investment practices.

4.5 Risks of financial intermediation

The formation of the financial intermediation ecosystem in the context of digitalization, of course, will be influenced by the emergence of new and increasing existing risks (Table 4).

Most often, vulnerability and potential ability to raise (generate) risks are associated with such FinTech solutions as money laundering / terrorist financing,

caused by cryptocurrencies, crowdfunding and marketplace lending, peer-to-peer lending, prepaid cards, initial coin offerings, DLT and cross-border payments. This was due to a lax regulatory and supervisory environment and institutions' lack of CDD / know your customer ("KYC") capability.

Table 4

PREREQUISITES AND CONSEQUENCES OF FINANCIAL INTERMEDIATION RISKS RELATED TO FINTECH

Kind of risk	Characteristics, prerequisites and consequences
Regulatory risk	the result of non-compliance with existing requirements and the inability of financial intermediaries to adapt to the new regulatory environment on their own; results in direct financial losses, regulatory penalties, reputational losses, and even shutdown
Compliance risk	occurs as a result of non-compliance with data privacy rules, legislation, standards; occurs when large amounts of information emerge and outsourcing is used
Operational risk	related to the implementation of business functions under the influence and interdependence of IT and market infrastructure
Investment risk	related to poor techno-economic justification for startups, increase in the cost of FinTech projects, amendments to investment regulations, crypto-assets or FinTech, possible impairment of investment assets
Cyber risk	arises because financial intermediaries depend on software and information technology
Strategic risk	arises from irrational management decisions that lead to a decline in market share or financial intermediary profits, if other market players are able to perform their functions more effectively through the introduction of FinTech
Laundering and Combating the Financing of Terrorism risk	abuse of technological and financial innovation for Laundering and Combating the Financing of Terrorism

Source: the authors' own development

In particular, the vulnerability of payment systems, financial products, crypto-assets to the possibility of conducting anonymous transactions, hidden cryptocurrency mining, fraudulent ICOs create additional risks of Money Laundering and Financing of Terrorism. Therefore, a top priority for AML / CFT is expanding

legal frameworks and operational measures to mitigate this risk, based on threat detection and comprehensive assessment of FinTech's impact on the financial system. In this regard, the FATF recommends to strengthen measures to identify participants in financial transactions; to continuously monitor and formulate a typology of transactions to identify suspects; to deepen cooperation between the countries of the world in the fields of information and financial intelligence, collecting evidence and their further exchange for the just punishment of criminals and terrorists, etc. (FATF, 2018). Besides, FATF has created its own global digital platform for AML / CFT and insists on constructive interaction between FATF, FinTech and RegTech.

It should be noted that regulatory and compliance risks are exacerbated on the one hand by lagging behind in the development of regulatory acts of preventive character, and on the other hand, by belonging of this function to the competence of different supervisory bodies, that requires intersectoral cooperation between state institutions (Semenog & Tsirulyk, 2017). However, the lack of coordinated action does not contribute to standardization of the regulatory framework, exchange of experience and acceleration of best practice implementation. Consequently, financial intermediaries are required to comply with the regulatory rules governing their own activities and, at the same time, to monitor and respond promptly to the adoption of regulatory rules for FinTech that determine the legitimacy of innovative technologies.

Investment risk is associated with cryptocurrencies, which are regarded as high-risk investment assets that bring economic benefits as their value increases in the future. However, the ambiguity of the position of central banks and regulators regarding their essence (commodity, payment instrument, security, currency value) multiplies investment risks and transfers them to a potential investor.

Cyber risk is dangerous because it can spread not only to financial intermediaries but also to their clients. Therefore cyber safety and cybersecurity effectiveness should be carried out through daily monitoring and management of cyber threats, and testing the resistance to cyber threats.

Thus, digitization is changing the perception of vulnerabilities and threats to the sustainability, reliability and security of financial intermediation that requires a prudent risk-oriented policy, whose effective implementation tool is modern digital technologies, despite their multifaceted nature.

4.6 The processes of digitalization of financial intermediation in Ukraine: today's realities

Like most countries in the world, Ukraine is responding to the challenges of the digital world and building a digital economy (Pantielieieva and etc., 2018). Systematizing the processes taking place in the financial services market of Ukraine, we determine that the formation of the national financial intermediation ecosystem is carried out in several directions..

First, digitalization and implementation of financial innovations in the business of financial intermediaries. Among the main digital trends that Ukrainian banks have been supporting lately are customer service (remote, mobile and e-banking), remote identification through BankID of the NBU and use of e-signature to provide banking and financial services, and the Open Banking concept in response to PSD2 standards (open digital ecosystem), cloud platforms (operating and service centers, service center), intelligent platforms (Big Data, AI).

Ukrainian PrivatBank became the first bank in the world to open a public API, which allows transfers between bank cards, payments on cards of any bank of Ukraine and international bank, purchase of vouchers of Skype, selected face value, mobile connection payments, sale of tickets for sports and entertaining events, etc. Innovative developments of Ukrainian banks were awarded at the "Innovation in Banking Technology Awards" international competition, namely: the electronic deposit system of Liqpay of PrivatBank in the field of cash handling and treasury technologies (PrivatBank, 2010), "Online Collection" technology (Privatbank, 2011). At the Teleopti Global User Forum, Alfa Bank (Ukraine) was awarded the Best Practice Award 2012 for implementing Teleopti CCC system, a comprehensive project for the construction of a distributed contact center with the introduction of additional modules with evaluate the quality of ZOOM QM conversations and personnel management systems.

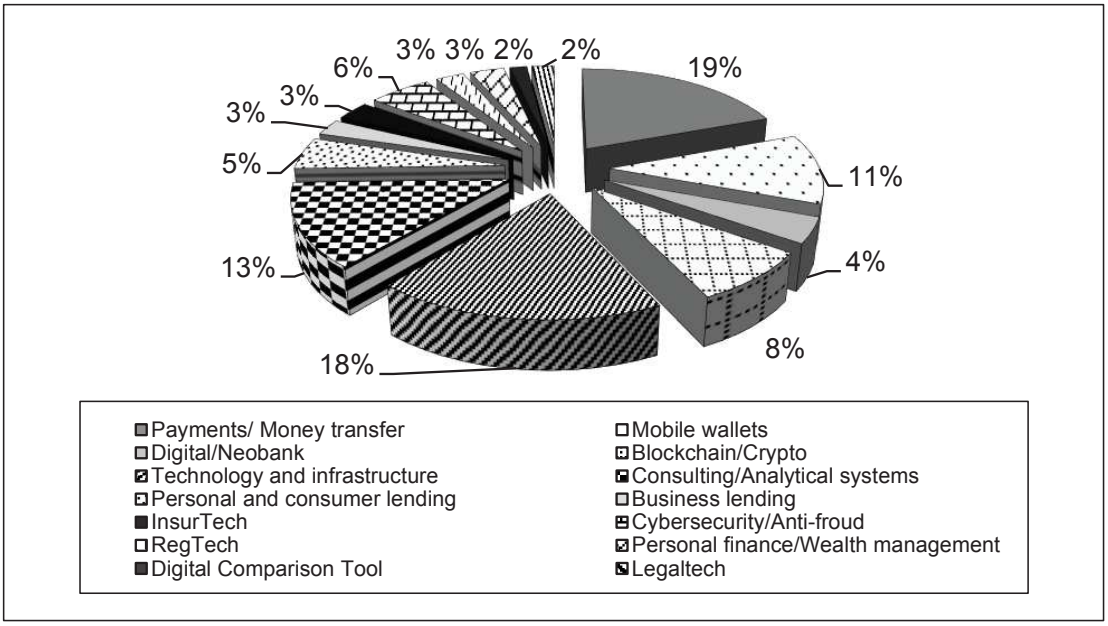
Secondly, the development of payment systems and cashless payments based on them. Ukrainian banks have long recognized cashless payments as one of their priorities, so today Ukraine is one of the leading countries in Europe in terms of both quantitative indicators and services and payment innovations. The payment space of Ukraine is formed by international and domestic systems, of which 26 are money transfer systems, 9 are interbank systems, 5 are card payment systems. Over the past five years, there has been a positive trend in the growth of cashless payments. Thus, in 2018, cardholders made 3.9 billion transactions with a volume of $ 102.53 billion. In particular, the largest share of such operations (35.8% or $ 16.25 billion) was P2P transfers, transactions on the Internet amounted to 32,6% or $ 15.05 billion, payments in the trading network were 29.3% or $ 13.58 billion (NBU, 2018).

Third, the expansion of the institutional structure and the formation of the institutional environment of financial intermediation.

Ukrainian banks are implementing innovations, establishing partnerships with FinTech startups. Today FinTech industry in Ukraine employs more than 100 companies, 58% of which have been established in the last three years, 43% operate in the international market, 63% are financed by their own funds, and 82% of them are located in Kyiv (Graph 3). Of the 57% of FinTech domestic companies, 73% are plannig to enter the international market in the near future (UAFIC, 2019). The National Bank of Ukraine actively supports the development of the FinTech market in Ukraine, created an Expert Group for Communications with Innovative Companies in order to clearly understand FinTech trends, provide legislative support and pursue a promising regulatory policy. PayLastic, Uplata, MOcash were recognized as the best fintech startups in Ukraine, which offer alternative solutions for non-cash payments (PaySpace Magazine Awards, 2018).

Graph 3

FINTECH COMPANY AREAS OF ACTIVITIES IN UKRAINE



Source: the authors' own development

In the FinTech industry, InsureTech technologies for the insurance market are developing in a separate direction. But their position in Ukraine now is only 5.3%. Today, InsureTech technologies on the Ukrainian insurance market are represented just a few startups (USAID, 2018).

Fourth, regulation of financial intermediaries and implementation of innovative initiatives by the central bank in response to global digital trends. The decisive event for financial intermediaries was the acquisition by the NBU the functions of a single regulator of the non-banking services market with the authority to carry out licensing, regulate and supervision over the activities of its members in accordance with international standards.

Among the initiatives of the regulator are the fundamental updating of the legislative regulation system of the Ukrainian market of payments and funds transfer in accordance with PSD2, the BankID remote identification system, the modernization of the NBU Electronic Payment System in accordance with the 24/7 format and the international standards IBAN and ISO 20022. During 2016—2019, it completed a closed pilot project on the development of the E-hryvnia blockchain platform to increase financial inclusion, reduce the share of cash in circulation, increase speed, convenience and transparency of payments. The NBU stipulates that E-hryvnia may be a national digital currency that is exchanged (1:1) for cash or non-cash without limitation and is a means of payment, and not a profitable instrument. The pilot tests included: 1) the creation of e-wallets and transactions with them, including the installation of their mobile applications on Android or iOS systems, replenishment of the wallet and exchange of e-hryvnia for cash using the "PROSTIR" national payment system through an integrated virtual terminal; 2) P2P transfers between wallets; 3) trading operations — replenishing mobile phone balance; 4) charitable contributions to the assistance to soldiers of Joint Forces Operation (NBU, 2019).

5. CONCLUSION

The study of the formation of the financial intermediation ecosystem in the context of digitalization, along with monitoring and identifying of digital trends at the global and regional levels has shown the importance of identifying the prerequisites of adoption and implementation of modern digital technologies by financial intermediaries.

The potential of digital technologies is quite powerful and is manifested in a wide range of areas of their application in the activities of financial intermedi-

aries. The Practice shows that the introduction of digital technologies is carried out mainly gradually within the framework of innovative strategies and has an incremental nature, taking into account the ability of financial intermediaries to transform business models and operational business processes. Only some digital technologies have the ability to create radical transformational effects in their implementation.

At the same time, the growing competitive pressure from FinTech companies is forcing traditional financial intermediaries to increase innovation activity, create their own FinTech laboratories or buy FinTech-startups, or interact with them within the framework of established innovative strategic alliances. Among the main motivating factors for the transition to an ecosystem approach are the deepening of the client-oriented approach, the need to expand the range and distribution channels of financial services, cost optimization and increase business efficiency. To build the financial intermediation ecosystem, it is important to further develop the institutional infrastructure by including new financial intermediaries and partners in it, the formation of a quality institutional environment through reliable legislative and regulatory support.

At the same time, it is necessary to maintain a balance between the desire to satisfy economic interests, optimize risks, maintain financial stability, protect consumers of financial services and continuously innovate and implement financial innovations.

Among the areas of further research are considered to continue developing conceptual approaches to building digital ecosystems for certain categories of financial intermediaries, justifying the feasibility of digital technologies implementation in their activities, modeling transformational change and forecasting possible economic and social effects, assessing and optimizing financial intermediation risks in the context of digitalization.

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TRENUTNA FAZA OBLIKOVANJA EKOSUSTAVA FINANCIJSKOG POSREDNIŠTVA U KONTEKSTU DIGITALIZACIJE

Sažetak

Širenje digitalne tehnologije dovelo je do nove faze u transformaciji financijskog sustava diljem svijete te je postalo okidačem za inovativne promjene u svim područjima financijskog posredovanja. Svrha ovog članka je analizirati preduvjete i trendove, identificirati prednosti, prilike i rizike digitalne transformacije financijskog posredništva, u okolnostima rastuće konkurencije i jačanja ne-posredništva, uključujući i Ukrajinu. Analitički i sistemski pristupi, metode komparativne i faktorske analize korišteni su za postizanje ciljeva članka. Najvažniji rezultati istraživanja, koji su teorijski značajni, uključuju potporu konceptualnim pristupima u formiranju zajedničkog ekosustava financijskog posredništva i ekosustava osiguranja, temeljenih na integraciji digitalnih tehnologija. Dokazano je da je, unatoč širenju digitalizacije, za financijske posrednike važna usklađenost s načelima orijentiranosti na kupce / klijente, inovativnost, učinkovitost i djelotvornost, sigurnost i organizacijska fleksibilnost. Identificirani su digitalni trendovi financijskog posredovanja, u odnosu na njegove temeljne funkcije, nove vrste rizika povezane sa širenjem FinTech-a i moguće posljedice njihovog utjecaja. Opisane su značajke institucionalne strukture financijskog posredništva i provedbe / implementacije financijskih inovacija u Ukrajini, regulatorna politika Narodne banke Ukrajine, prikazana je inovacijska aktivnost FinTech industrije, u kontekstu širenja digitalizacije, što može biti korisno u proučavanju stranog iskustva. Rezultati ovog istraživanja mogu poslužiti kao osnova razumijevanju ključnih trendova, konceptualnih pristupa promjeni poslovnih modela i oblikovanja ekosustava financijskog posredništva, uputa i mogućnosti uvođenja inovativnih financijskih tehnologija, za ispravnu orijentaciju i odgovor na dinamične promjene na tržištu financijskih usluga.

Ključne riječi: digitalna ekonomija, digitalizacija, financijske inovacije, financijsko posredništvo, digitalni ekosustav