ORIGINAL PAPER

DOI: 10.26794/2587-5671-2024-28-6-143-153
UDC 336.717.061.1(045)
JEL G21

The Impact of Decentralized Finance on the Activities of Traditional Financial Intermediaries

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ABSTRACT

Over the past decade, digitalization, which has become a key driver of innovation in the financial industry, has led to the development of new products and financial services. The services and opportunities provided in the field of decentralized finance have similar characteristics to traditional financial services. The lack of sufficient experience in the functioning of the decentralized finance sphere determines the relevance of the study of the content and problems of the development of this format of financial organization. The object of study is the relations arising in the process of providing financial services in traditional and decentralized finance. The subject of the study is the impact of decentralized finance on the activities of traditional financial intermediaries. The purpose of the study is to determine the aspects of the impact of decentralized finance on the activities of traditional financial intermediaries. The objectives are to study the theory of trust in relation to decentralized finance, identify problems of their development, assess the challenges and prospects for the impact of decentralized finance on the activities of traditional financial intermediaries. The authors use general scientific and special methods, including system, comparative analysis, generalization, scientific abstraction. The scientific novelty of the study lies in a comprehensive assessment of the impact of decentralized finance on the activities of traditional financial intermediaries through the prism of the capabilities of the decentralized finance system at the current stage of financial market development. The authors conducted a study of the theory of trust in relation to decentralized finance, and also proposed forms of ensuring trust in financial services provided in the traditional (TradFi) and decentralized financial systems (DeFi). To assess the challenges and prospects of decentralized finance and their impact on the activities of traditional financial intermediaries, a PEST analysis was conducted, identifying groups of political, economic, technological and socio-cultural factors of influence. It is concluded that the influence of the decentralized finance sphere on the activities of traditional financial intermediaries will expand due to the increase in the market capitalization of DeFi and the spread of systemic risks characteristic of TradFi. Focus on minimizing risks should facilitate the use of DeFi services by traditional financial intermediaries in the context of creating and developing innovative projects. The conducted research can be useful both for users of traditional and decentralized finance services and for regulatory and supervisory authorities.

Keywords: traditional finance (TradFi); decentralized finance (DeFi); central banks digital currencies (CBDC); digital financial assets; financial service; PEST-analysis

For citation: **Belova M.T., Rizvanova I.A. The impact of decentralized finance on the activities of traditional financial intermediaries. *Finance: Theory and Practice*. 2024;28(6):143-153. (In Russ.). DOI: 10.26794/2587-5671-2024-28-6-143-153**

INTRODUCTION

Decentralized finance (DeFi) from the perspective of the Bank of Russia is a model of financial relations without intermediaries and without establishing a specific type of digital asset [digital financial assets, central bank digital currencies (CBDCs), stablecoins, cryptocurrencies, tokenized cashless currencies]. Despite the small market share that DeFi occupies in the global market, the decentralized financial environment has already managed to create its own unique infrastructure. However, with the significant expansion of the DeFi market, systemic risks inherent to the traditional financial market may also arise. Therefore, it is necessary to study the features of innovative systems, analyze the impact of DeFi on the activities of traditional financial intermediaries in order to improve the regulation of the Russian financial market.

As noted, the Bank of Russia emphasizes the financial technology in the terminology of DeFi, on the basis of which transactions are conducted without intermediaries: Decentralized finance (DeFi) is a model of financial organization in which there is no intermediary, transactions are carried out automatically using smart contracts that execute on the basis of distributed ledger technology (DLT), and users have direct control over their assets.[1]

However, many specialists consider DeFi as a collection or system of *financial services* (decentralized financial services and applications) based on public blockchains. At the same time, transactions are carried out automatically using smart contracts. Let's examine the presented definition in more detail. In accordance with Article 4 of Federal Law No. 135[2] financial service is understood as a banking service, an insurance service, a service on the securities market, a leasing service, as well as a service provided by a financial organization related to the attraction and/or placement of funds of legal entities and individuals. The definition is revealed from the perspective of the object-subject approach, while the law further stipulates that this service can only be provided by financial organizations that have the appropriate licenses for providing a particular financial service. However, in DeFi, participants can be various legal entities, which may or may not fall under the category of financial organizations as well as individuals.

It should be noted that, on the other hand, in the field of decentralized finance, financial services are provided that have their own specifics — based on distributed ledger technology (peer-to-peer lending, savings, spot trading, derivatives, etc.), while in many countries, regulation is virtually absent and, accordingly, there is no central administrator. But in practice, such an administrator is a group of private individuals who develop and approve rules within their platforms and exchanges, which are perceived as certain regulatory provisions. If they are not followed, the necessary financial service will not be provided.

In a study conducted by the analytical agency Statista,[3] t is stated that DeFi resembles crowdsourcing, which literally translates to the use of crowd resources. In his research, W. Mensi [1] defines DeFi as a collection of cryptocurrencies used on automated decentralized platforms that operate using smart contracts. The authors of the study S. Gunay [2, 3] adhere to a similar ideology. A different position is held by the group of researchers F. Şoiman, J.-G. Dumas, S. Jimenez-Garces, and others [4–11]: DeFi is considered a system in which financial assets and products are offered using smart contracts in a decentralized blockchain network.

[1] Decentralized finance. Report of the Bank of Russia. URL: https://cbr.ru/Content/Document/File/141992/report_07112022.pdf (accesed on 04.10.2023).

[2] Federal Law No. 135 from 26 July 2006 «On Protection of Competition».

[3] Decentralized Finance (DeFi) — statistics & facts. URL: https://www.statista.com/topics/8444/decentralized-finance-defi/#topicOverview (accessed on 04.02.2024).

Despite the wide range of research on the topic of DeFi, a number of scientific problems still remain outside the purview of researchers: from the conceptual foundations of functioning to the directions of development and regulation of decentralized financial environments. The practical significance of solving these problems has predetermined the necessity of researching the DeFi sphere. It should be noted that within the framework of this study, the authors adhere to the conceptual framework presented by the Bank of Russia.

FORMS OF TRUST ENSURANCE IN TRADFI AND DEFI

DeFi offers peer-to-peer interactions without the need for centralized management, thereby eliminating financial intermediaries. Among the factors determining interest in decentralized finance compared to traditional finance, the following can be highlighted: anonymity (conditional, most likely pseudonymity according to the Bank of Russia); high inclusivity; the possibility of using it as a tool for long-term investment; the potential for quick profits; distrust of TradFi; fear of missing out on opportunities; and the presence of direct control over assets for users. It should be noted that there is both a low base effect and an increase in the role of digital services in the financial sector.

At the same time, it is worth noting that the capitalization of the global DeFi market is incomparably small compared to the capitalization of the cryptocurrency, gold, stock, real estate, and derivatives markets. As of 16 February 2024, the total market capitalization of cryptocurrencies exceeded $ 2 trillion, while DeFi reached $ 80 billion (*Fig. 1*).

The concept of "distributed ledger technology" (DLT) encompasses a range of technologies such as blockchain, hashgraph, holochain, and others, which differ from each other in terms of the structure of the ledger data, methods of consensus, and data synchronization. Thus, a specific case of DLT is blockchain technology, and the main feature of distributed ledger technology is the *distribution of the system*.

In simple terms: a centralized system is one where there is a central administrator; in a decentralized system, there is no single administrator, but there are several central administrators; a distributed system allows users to share ownership of data. However, a system can be both decentralized and distributed, just as it can be centralized and distributed. Accordingly, the question arises about users' trust in the system or in the providers of decentralized financial services. Proponents of DeFi describe it as follows: code is law,[4] but does this property work in practice? Is it possible for a financial system to exist and develop without the need to establish trust between individual entities? Based on the scalability trilemma, which includes the interrelated properties of distributed ledger technology — security, scalability, decentralization — any DLT can have no more than two of the presented properties. It is worth emphasizing that such a property of DLT as security, which directly affects trust, may take a back seat.

The theory of trust among participants in economic relations was considered as early as the 19th century by K. Knies [12]: trust as a prerequisite for the emergence of economic relations. Trust can be defined as the subjective probability that people attribute to the possibility of being deceived.

The traditional financial system largely depends on trust [13]: from trust between financial counterparties to trust in the legal environment that ensures the enforcement of transactions. In contrast, the rapidly growing DeFi system is built on a paradigm where the financial obligations of individuals are defined in computer code stored on the blockchain, and participants must trust the computer

[4] What Is Decentralized Finance (DeFi)? URL: https://coinmarketcap.com/academy/glossary/defi (accessed on 10.10.2023).

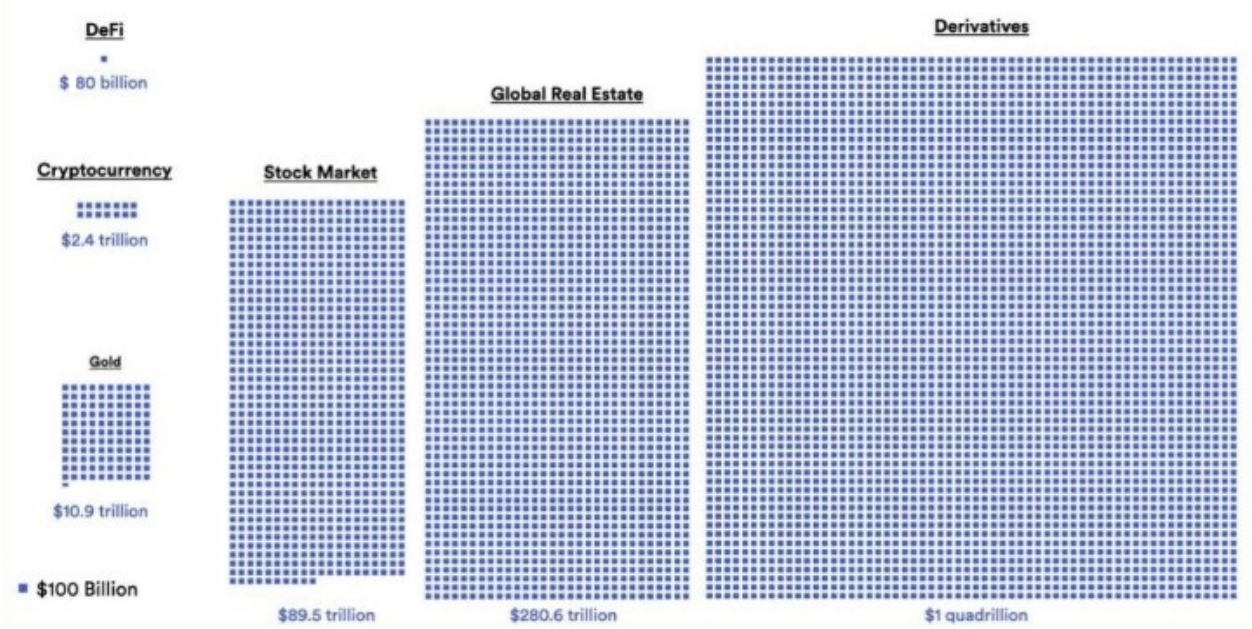

Fig. 1. **Capitalization of Global Financial Markets (1 Square is Equal to $ 100 Billion)**

Source: URL: https://cointelegraph.com (accessed on 03.11.2024).

code — automatically ensuring compliance with the terms in the smart contract. Thus, it can be said that the need for trust between individual participants in the system is lost, and DeFi platforms differ from the traditional model based on trust in the financial system, relying on lawful and efficient interaction between financial intermediaries and participants in the centralized system.

Let's consider the forms of trust assurance from end consumers for financial services provided by TradFi and the services provided by DeFi (*Table 1*). As the object of analysis in TradFi, a basic set of financial services[5] has been chosen: insurance, lending, savings formation (including ISAs), and payment services. As the object of analysis in DeFi, the following types of assets have been selected: tokenized cash currencies, central bank digital currencies (CBDCs), cryptocurrencies, stablecoins, digital financial assets.

The theory of trust is developing not only in scientific research. It should be noted that in the documents of the Bank of Russia, one of the main directions for the development of the financial market is identified as strengthening citizens' trust in the financial market and increasing the accessibility of financial services — ...preservation and enhancement of citizens' trust in the financial market, including the creation of incentives and conditions for their interest in long-term and conscious participation in the capital market.[6]

Trust is a prerequisite for the emergence of economic relationships: it is present in both TradFi and DeFi. In DeFi, it appears at the moment of registration on the respective platforms, when the user accepts certain rules. However, this trust is ensured (sometimes not) at the micro level, i.e., the financial well-being of participants ultimately depends on the reliability of individual providers. Due to years of experience and traditional forms of relationships in TradFi, trust and legal support are ensured at the state level.

[5] Website of the Bank of Russia. URL: https://cbr.ru/develop/development_affor/ (accessed on 16.11.2023).

[6] Main directions for the development of the financial market of the Russian Federation for 2023 and the period of 2024 and 2025. Report of the Bank of Russia. URL: https://cbr.ru/Content/Document/File/143773/onfr_2023–2025.pdf (accessed on 10.10.2023).

Table 1

Forms of Trust Assurance in Financial Services Provided by TradFi and DeFi

Characteristic	TradFi	DeFi
Insurance system	Insurance: since 2013, the protection of the lawful interests (including) of policyholders and insured persons has been legally established as one of the functions of the mega-regulator, and strategic goals and objectives for the further development of this area have been defined[a] Savings: in accordance with Law No. 177[b], insurance compensation for deposits in a bank where an insured event has occurred is paid to the depositor in the amount of 100% of the deposit amount in the bank, but not exceeding 1 400 000 rubles. *Payment services:* the requirement to ensure information protection when transferring funds[c] *Lending:* the creation of appropriate reserves by banks	Insurance is implemented only through smart contracts.
Regulation and supervision	TradFi anticipates regulation and oversight at all stages of providing financial services	The principle of decentralization. However, any type of DLT has regulation in the form of consensus, where, in turn, a group of private individuals acts as central administrators.
Provision	Full asset and capital backing; the presence of special structures for conducting bankruptcy procedures; trust in the existing national currency.	Depending on the type of asset: – stablecoins (Tether, USD Coin, Terra) — full or partial backing by a set of assets or the use of an algorithm to maintain stability; – unsecured cryptocurrencies (Bitcoin, Ethereum) — absent; – tokenized assets (Tesla tokenized stock FTX, Amazon tokenized stock FTX) — backed by assets (securities, commodities, real estate, and other real or financial assets, the right to receive a specific good or service)
Protection of consumer rights in the financial market	Implementation by the Bank of Russia of reactive and preventive measures to protect consumer rights in the financial market	The status of cryptocurrency in the Russian Federation is still not fully regulated, which leads to risks in its circulation. Industries with predominant public regulation (bankruptcy, enforcement proceedings, etc.) directly recognize cryptocurrency as property, and civil and criminal law also adhere to this trend, which imposes restrictions on any transactions and operations involving it. When registering on cryptocurrency exchanges, users need to carefully and thoroughly familiarize themselves with the rules of the specific investment project/cryptocurrency exchange, as well as the terms of the contracts. In many cases, plaintiffs are unable to have their claims satisfied in court due to the presence of disclaimers in the documents and the risky nature of cryptocurrency transactions.

Table 1 (continued)

Characteristic	TradFi	DeFi
Inclusivity	Since April 2020, ensuring the accessibility of financial services in the Russian Federation has been legislatively established as one of the functions of the mega-regulator, and strategic goals and objectives for the further development of this area have been defined[d]	The level of inclusion is higher compared to TradFi, partly because the infrastructural functions (issuance organization, storage, accounting, and settlements) are carried out without the use of centralized infrastructure (there is no responsible legal entity).
Identification/ possibility of conducting KYC procedures	When concluding a contract for the provision of the financial services in question, a mandatory condition is the identification of the client and the possibility of conducting KYC procedures, except for the selected electronic payment method when making transfers of electronic money (however, the limit is restricted).	Anonymity is possible, depending on the design and requirements of the intermediaries.

Source: Compiled by the authors.

Note: [a] Federal Law No. 86 of 10 July 2002, "On the Central Bank of the Russian Federation (Bank of Russia)." [b] Federal Law No. 177 of 23 December 2003 "On Insurance of Deposits in Banks of the Russian Federation". [c] Regulation of the Bank of Russia dated 04.06.2020 No. 719 "On the requirements for ensuring information security during the transfer of funds and on the procedure for the Bank of Russia to monitor compliance with the requirements for ensuring information security during the transfer of funds." [d] Federal Law No. 86 of 10 July 2002, "On the Central Bank of the Russian Federation (Bank of Russia)."

By their nature, the financial services provided in DeFi are derivatives of traditional financial services and products. Therefore, there is a likelihood of not only the development of risks specific to DeFi environments but also the emergence of systemic risks. As of today, there is no unified position in either the global or the Russian scientific community regarding which approaches and regulatory scenarios are optimal for ensuring a balance between the development and regulation of DeFi. However, there is no doubt that with the increase in market volumes, appropriate legislative regulation will be necessary, aimed both at protecting the rights of financial services consumers (the financial well-being of citizens) and at ensuring the financial stability of the DeFi platforms themselves.

ASSESSMENT OF THE IMPACT OF DECENTRALIZED FINANCE ON THE ACTIVITIES OF TRADITIONAL FINANCIAL INTERMEDIARIES

To assess the impact of decentralized finance on the activities of traditional financial intermediaries, the PEST analysis methodology can be applied. As an analytical tool, it is most often used for analyzing the macroenvironment of an enterprise, but, in our opinion, it is also appropriate to use it to obtain an objective understanding of the state of the financial market and, in particular, to assess the prospects for the development of decentralized finance in light of the most important influencing factors (*Fig. 2*).

PEST analysis is advisable to use for assessing the challenges and prospects of decentralized finance and their impact on the activities of traditional financial intermediaries, as this method allows:

- identify general market risks and individual opportunities for market participants;
- show possible vectors of change;
- develop a list of external market influences;
- optimize planning, organizational and infrastructural processes, product development, and project management development.

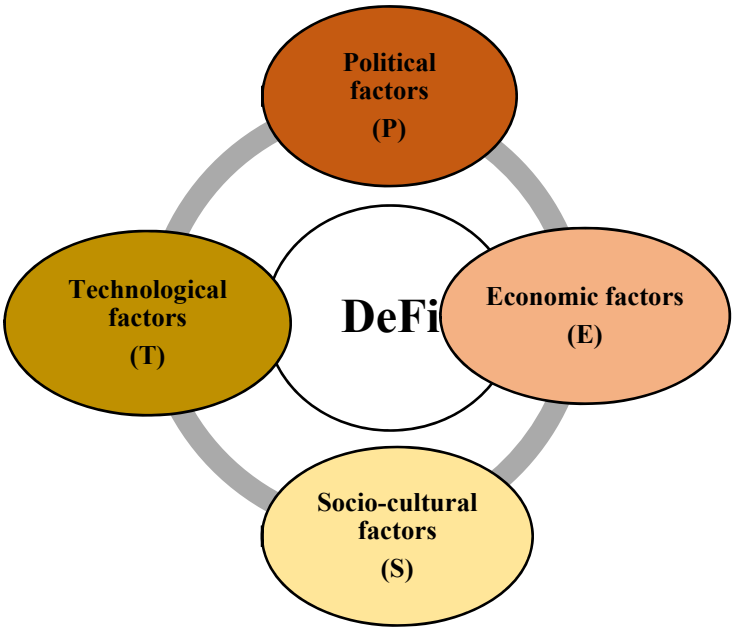

Fig. 2. **Factors of PEST Analysis DeFi**

Source: Compiled by the authors.

Within the framework of the PEST analysis, we will create a matrix (*Table 2*) of political and legal (P), economic (E), sociocultural (S), and technological (T) factors. Next, we will describe the identified factors in detail, determine the opportunities and threats, as well as the ways to neutralize their impact.

Political factors

At the moment, there is a rapid increase in interest in DeFi worldwide, while in Russia, there is no regulatory framework that fully governs this area. This creates risks of uncertainty and potential legal issues. Market participants should monitor DeFi trends and prospects to minimize their risks. Due to the rapid development of DeFi, the state, in addition to developing and implementing regulatory frameworks, will regulate the activities of financial intermediaries in terms of providing services and conducting familiar operations using new technologies, combating the legalization (laundering) of proceeds obtained through criminal activities, and financing terrorism, which, in turn, may generally affect the speed of technology adoption in the financial sector.

Economic factors

The pace of economic growth in the country is not insignificant in the context of its impact on the implementation of decentralized finance, especially when we talk about the largest financial institutions. Funding for the implementation of developments in the DeFi sector directly depends on economic growth, as potential negative changes in the economy are highly likely to affect the activities of financial institutions and cut budgets for DeFi projects. Changes in interest rates in the economy (the key rate of the Bank of Russia, rates in the interbank lending market) affect the capital and profitability of traditional financial intermediaries, which naturally leads to questions about the potential competition between decentralized financial platforms and traditional financial institutions.

Socio-cultural factors

As consumers of financial services gradually learn about some significant advantages of DeFi, their financial behavior and preferences may change, for example, the choice of new services in the DeFi format. Therefore, financial intermediaries will need to adapt

Table 2

The PEST Analysis Matrix

P (POLITICAL)	E (ECONOMIC)
• Political stability • Protection of financial services consumers' rights • Regulatory framework • State regulation and compliance control	• Economic growth rates • Fiscal factors (inflation, interest rates, etc.) • Currency regulation and restrictions • Investment climate
S (SOCIO-CULTURAL)	**T (TECHNOLOGICAL)**
• Demographic trends (population size, growth rate, age) • Generational change (B + X + Y ⩾ Z)* • Customer preferences and financial literacy of the population	• Key technological changes in the financial industry • The degree of penetration and use of digital financial technologies, particularly artificial intelligence • Cybersecurity

Source: Compiled by the authors.

Note: * According to the generational theory of W. Strauss and N. Howe, Generation B consists of people born between 1940 and 1959, Generation X between 1960 and 1979, Generation Y between 1980 and 1994, and Generation Z between 1995 and 2010.

their products and services to the changing preferences of users.

With the increase in the overall level of financial literacy among the population, there will likely be a demand for the implementation and development of more DeFi services. It should also be noted that a generational shift is occurring, i.e., Zoomers (Generation Z) are more technologically savvy than Generation X, and to some extent Generation Y. Thus, the new generation can more quickly master modern technologies, actively use them, and, importantly, recognize their advantages.

As the main threat, one can highlight the demographic situation, which is capable of restraining the potential for economic growth and increasing the burden on the country's pension system. It is also worth noting the significant share of conservative financial service consumers in Russia [15].

Technological factors

DeFi is significantly based on blockchain technology. Traditional financial organizations need to keep an eye on developments in this area to be able to integrate new technological solutions into their operations. As financial and/or banking services transition to a digital format, the risks of cyber threats become increasingly evident. Therefore, financial intermediaries should invest funds in the creation and/or acquisition of technologies that ensure cybersecurity and cyber resilience, protecting customer data during financial transactions.

In the context of the factors considered, we will perform calculations using the expert evaluation method (*Table 3* and *4*).

The results of the conducted PEST analysis can be used for the development of effective strategic planning at the state level, the development of regulatory aspects of the activities of financial intermediaries, as well as for identifying current problems and/or potential future changes in financial markets under the influence of the spread of DeFi services. As a result of evaluating the factors in all the considered categories, it can be concluded that political and technological factors of the external environment are the most significant in the context of DeFi development. Focusing on minimizing the

Table 3

PEST Analysis of the Impact Assessment of DeFi (With Factor Estimates)*

Description of the factor	The influence of the factor (1–3 points)	Expert assessment					Average rating	Weight-adjusted assessment
		1	2	3	4	5		
Political								
1. Regulatory framework	3	5	5	4	5	5	4.8	0.6
2. State regulation and compliance control	2	4	4	5	4	5	4.4	0.4
Economic								
1. Economic growth rates	2	4	4	2	3	2	3	0.4
2. Fiscal factors	1	1	1	2	2	1	1.4	0.2
3. The state of the banking sector	2	3	4	4	4	3	3.6	0.4
Socio-cultural								
1. Customer preferences	1	2	2	3	2	1	2	0.2
2. Financial literacy	2	3	4	3	4	4	3.6	0.4
3. Generational change ($B + X + Y \geq Z$)	2	3	3	3	4	3	3.2	0.4
Technological								
1. Development of DeFi technologies	3	5	5	5	5	5	5	0.6
2. Cybersecurity	3	3	5	4	4	5	4.2	0.6

Source: Compiled by the authors.

Note: * Scores: 0 — no effect, 1 — neutral effect, 2 — moderately positive effect, 3 — positive effect. As experts, representatives of the financial industry, who fully possess the necessary knowledge about the specifics of DeFi and sufficient experience in this professional field.

Table 4

The Results of the PEST Analysis of the Assessment of the Impact of DeFi

Political		Technological	
The factor	**Weight**	**The factor**	**Weight**
1. Regulatory framework	0.6	1. Development of DeFi technologies	0.6
2. State regulation and compliance control	0.4	2. Cybersecurity	0.6
Socio-cultural		**Economic**	
The factor	**Weight**	**The factor**	**Weight**
1. Customer preferences	0.2	1. Economic growth rates	0.4
2. Financial literacy	0.4	2. Fiscal factors	0.2
3. Generational change ($B + X + Y \geq Z$)	0.4	3. The state of the banking sector	0.4

Source: Compiled by the authors.

risks associated with them, as the authors suggest, will help traditional financial intermediaries more organically develop the application of DeFi within their current activities and in the development of new projects.

CONCLUSION

The examined features of decentralized finance, as well as their impact on the activities of traditional financial intermediaries in the context of the digital transformation of the Russian economy, synthesize and expand traditional notions of TradFi and DeFi. The authors have determined that the goal of regulation and supervision in the financial market is trust as a prerequisite for the emergence of economic relationships, which is present in both TradFi and DeFi. In the field of decentralized finance, trust is manifested at the moment of registration on the respective platforms, when the user accepts the rules; however, this trust is ensured (sometimes not) at the micro level. That is, the financial well-being of participants ultimately depends on the reliability of individual providers. Due to years of experience and traditional forms of relationships in TradFi, trust is ensured at the state level along with regulatory support.The authors note that by their nature, the financial services provided in DeFi are derivatives of traditional financial services and products. As transaction volumes expand and DeFi market capitalization increases, both specific risks and systemic risks characteristic of TradFi may arise.

To identify key trends and assess the impact of decentralized finance on the activities of traditional financial intermediaries, the PEST analysis method was applied. As a result of the analysis of factors from various categories, it was concluded that political and technological factors of the external environment are the most significant in the context of DeFi development. Focusing on minimizing the risks associated with them will solve most of the emerging problems in this area, which will help traditional financial intermediaries consider the possibility of applying DeFi services and opportunities within their activities and the development of technological projects.

ACKNOWLEDGEMENTS

The article is based on the results of the research carried out at the expense of budgetary funds under the state assignment to the Financial University. Financial University, Moscow, Russia.

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Conflicts of Interest Statement: The authors have no conflicts of interest to declare.

The article was submitted on 26.12.2023; revised on 25.01.2024 and accepted for publication on 27.03.2024.
The authors read and approved the final version of the manuscript.