

## Цифровые финансовые инструменты: от определения к практическому использованию

### Digital financial instruments: from definition to practical use

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Широкое использование в мировой практике производства и реализации товаров и услуг информационно-коммуникационных технологий получило название «цифровая экономика». Однако до настоящего времени в мировой практике нет единого согласованного определения этого понятия. Существующие определения рассматривают цифровую экономику с различных сторон с акцентом на техническую сторону этого явления. В этой связи авторами исследования поставлена цель не только выявить основные мировые тенденции использования цифровых технологий в финансово-банковском секторе, но и сформировать определенный понятийный аппарат сферы цифровой экономики. С использованием методологии системного подхода нами сделан акцент на экономическую сторону при рассмотрении финансовых технологий, инструментов и механизмов — финансовых отношений. Даны определения цифровой экономики, финансовых цифровых технологий, инструментов, механизмов как способов урегулирования финансовых отношений. Показано, что финансовый механизм есть совокупность финансовых инструментов, а финансовая технология есть способ организации предоставления финансовых услуг. Отсутствие юридической базы, закрепляющей в законодательстве понятия цифровых инструментов и механизмов, является барьером на пути широкого использования этого инструментария и в международной практике. Выявлен ряд позитивных и негативных факторов широкого использования цифрового финансового инструментария. Очерчены направления проведения дальнейших исследований по представленной тематике, требующие скорейшей разработки. Полученные результаты могут быть использованы для включения в лекционный и практический материал при подготовке специалистов по соответствующим экономическим специальностям, а также сформулированные авторские определения понятий «цифровой финансовый инструмент», «цифровой финансовый механизм» применимы для совершенствования законодательной базы страны в сфере регулирования финансовых отношений в условиях цифровой трансформации.

**Ключевые слова:** цифровая экономика; цифровые финансовые инструменты; цифровые финансовые механизмы; финансовая модель; финансовые отношения, урегулирование финансовых отношений

The widespread use of information and communication technologies in the world practice of production and sale of goods and services has been called the “digital economy”. However, to date, there is no single agreed definition of this concept in the world practice. The existing definitions look at the digital economy from different angles, with an emphasis on the technical side of this phenomenon. In this regard, the authors of the study set the goal not only to identify the main global trends in the use of digital technologies in the financial and banking sector, but also to form a certain conceptual apparatus of the concepts of the digital economy. Using the methodology of the systematic approach, we focus on the economic side when considering financial technologies, tools and mechanisms — financial relations. The definitions of digital economy, financial digital technologies, tools, and mechanisms as ways of regulating financial relations are given. It is shown that the financial mechanism is a set of financial instruments, and financial technology is a way of organizing the provision of financial services. The lack of a legal framework that establishes the concepts of digital tools and mechanisms in the legislation is a barrier to the widespread use of these tools in international practice. A number of positive and negative factors of the widespread use of digital financial tools have been identified. The directions of further research on the presented topic, which require early development, are outlined. The results obtained can be used for inclusion in the lecture and practical material in the preparation of specialists in the relevant economic specialties, as well as the formulated author’s definitions of the concepts of “digital financial instrument”, “digital financial mechanism” are applicable to improve the country’s legislative framework in the field of regulation of financial relations in conditions digital transformation.

**Keywords:** *digital economy; digital financial instruments; digital financial mechanisms; financial model; financial relations, settlement of financial relations*

## Introduction

The informatization of society is the objective reality of our days, in which both human beings themselves and the technologies of production and sale of goods and services produced are developing. Under the influence of information and communication technologies, lifestyles, ways of thinking, ways of expedient activity and ideas about production and the production process are changing. All these changes in the economic sphere have received a name shared by most of the world community — the digital economy. However, to date there has been no agreed definition of the digital economy. The definitions we have identified make mostly technical sense, looking at the digital economy from different technological perspectives. This assertion is supported by a wide range of approaches to the definition of the digital economy in the report of the XX April International Scientific Conference on Economic and Social Development “What is the Digital Economy? Trends, competencies, measurement” (NRU HSE) [1].

We largely share the approach to the definition of the digital economy set out in the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030<sup>1</sup>, which with our additions is as follows: *the digital economy is an economic activity based on digital technologies for automatic collection, transmission, storage, processing and preparation of any (unlimited) amount of information for managerial decision-making and management of technological processes of production, delivery and sale of goods.*

This definition allows us to judge the digital economy as a product of the traditional economy, in which obsolete means of communication, collection, transmission and processing of information have been replaced by modern information and communication technologies, and traditional technologies for producing goods and services have been replaced by robotic complexes.

The “digital revolution” has not left aside the financial and banking sector of the economy, which, according to researchers [2, p.48; 3, p.34; 4, p.9; 5; 6] has primarily undergone digital transformation, as the front line of humanity, most fully using computer technology in its activities.

In financial and banking activities, the first digital transformation took place in the means of bank communication, then the format of information presentation began to change, and gradually the traditional banking business began to move away from the “office structure” to the world of virtual banking services, where digital financial instruments displaced the traditional paper products. This fact is confirmed in a report by the International Chamber of Commerce [7], stating the fact that digital technologies have become most widespread in the financial sector of the economy, as the most receptive sector to innovation.

The purpose of this article is to not only identify the main global trends and assess the practical use of digital technologies in the financial and banking sector of the economy, but also based on a systematic approach justify the author's vision of such concepts as financial instruments, mechanisms and technologies.

The relevance of the presented research is determined by the fact that digital technologies and digital financial instruments, as practice shows [8; 9; 10], allow reducing the transaction and time costs of financial organizations not only for the preparation and processing of documentation, but also significantly reduce the time of economic transactions served. It should be noted that the use of information technologies benefits the state, business structures and individual citizens, who receive a real return in the form of expanding the information base, reducing the cost of information and creating an information commodity.

## Research theory/methodology

No definitions of digital financial technologies, instruments and mechanisms, much less definitions reflecting their financial essence, have been identified in the domestic and foreign literature. In this regard, in formulating these definitions as a conceptual apparatus for considering the specifics of digital financial instruments, we will take as a basis the established system of traditional definitions of concepts for various sectors of the economy.

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<sup>1</sup> *O strategii razvitiya informacionnogo obshchestva v Rossijskoj Federacii na 2017-2030 g: Ukaz Prezidenta Rossijskoj Federacii ot 09.05.2017 №203* [On the Strategy for the Development of Information Society in the Russian Federation for 2017-2030: Decree of the President of the Russian Federation of 09.05.2017 № 203]. Available at: <http://pravo.gov.ru>. (Accessed: 05.02.2021). (In Russian),

In a narrow sense, technology (from Ancient Greek τέχνη — art, skill, ability; λόγος — “word”, “thought”, “meaning”, “concept”) is defined as a set of methods and tools for achieving the desired result<sup>1</sup>; in a broader sense, the application of scientific knowledge to solve practical problems. That is, technology includes ways of action, their modes, sequence of actions (algorithm) [11, p. 205]. Nowadays, technology also includes control over the characteristics of the obtained result. The description of production processes, instructions for their implementation, technological rules, requirements, maps, schedules, etc. are usually called production technology [12]. [12]. The concept of “financial technology” will be associated with the organization of financial transactions of the bank as a financial and banking institution, which implements a variety of techniques and methods of banking operations related to the movement of financial assets.

On this basis, let us give a general definition of “financial (banking) technology” from the perspective of a systemic approach. Financial technology is *a self-regulating system of ways, procedures, mechanisms and financial instruments used to meet customers’ needs for financial services permitted by the current legislation (banking services), using various technical means, information and communication technologies and software, fixed in the relevant internal regulations of the bank, based on the norms of the current legislation, ensuring its sustainable competitiveness*. The presented definition has a universal character and is applicable to both traditional and digital forms of customer service organisation.

However, there are two not entirely unambiguous concepts in the definition: “financial instruments” and “financial mechanisms”. For example, International Financial Reporting Standards (IFRS) define a financial instrument as a contract resulting in a financial asset for one entity and a financial liability or equity instrument for another<sup>2</sup>. In the EEU, a financial instrument<sup>3</sup> is treated as a security or object of civil rights<sup>4</sup>, money, securities, including derivative securities, derivative financial instruments and other financial instruments, securities<sup>5</sup>, cash in national and foreign currency, security or derivative financial instrument<sup>6</sup>.

To eliminate ambiguity in the definition of “financial instrument”, we will take as a basis the most general definition of “instrument” given in Ozhegov’s dictionary, interpreting the concept of “instrument” as “a means, a method used to achieve something чего-либо”<sup>7</sup>. If we consider a business contract concluded (signed) between the parties as a document certifying the occurrence of financial relations between the parties, the method of resolving these relations can be plural in nature and can be recorded in the contract. An agreement can also be concluded in the form of a public offer. Based on the logic of this reasoning, we define *a financial instrument as a way to settle (implement) financial relations, legally enshrined in the current legislation*. When carrying out business activities, it is often necessary to use not one but several simple financial instruments dispersed in time and space, for example, forfeiting operations or an international letter of credit. In this case, it is possible to speak not about an instrument, but about a mechanism of settlement of financial relations, including several simple financial instruments, having their functional purpose and united by a common goal — a system. *A financial mechanism can then be defined in general terms as a system of ways of settling financial relations as set out in the legislation in force*.

Moving to the field of digital technologies, we define *digital financial instruments and mechanisms as unified digital models enshrined in current legislation or international treaties (agreements) that implement a certain function of regulating financial relations between subjects of economic transactions or a set of these models that*

<sup>1</sup> Glossarij. Tehnologiya [Glossary. Technology]. *Glossarij* [Glossary]. Available at: [http://www.glossary.ru/cgi-bin/gl\\_sch2.cgi?RS\)turujoo](http://www.glossary.ru/cgi-bin/gl_sch2.cgi?RS)turujoo) (Accessed: 12.02.2021). (In Russian).

<sup>2</sup> Mezhdunarodny’j standart finansovoj otchetnosti (IAS) 1 «Predstavlenie finansovoj otchetnosti» [International Accounting Standard (IAS) 1 “Presentation of Financial Statements”]. *Sovet Ministrov Respubliki Belarus’* [Council of Ministers of the Republic of Belarus]. Available at: <http://www.government.by/upload/docs/file4b61435c2c6966a9.PDF> (Accessed: 06.02.2021). (In Russian).

<sup>3</sup> Civil Code of the Republic of Kazakhstan (General Part). *Jurist*. Available at: [https://online.zakon.kz/document/?doc\\_id=1006061](https://online.zakon.kz/document/?doc_id=1006061) (Accessed: 13.02.2021).

<sup>4</sup> Ob investicionny’x fondax: Zakon Respubliki Belarus’ [On Investment Funds: The Law of the Republic of Belarus]. *Nacional’ny’j pravovoj Internet-portal. 2017. 52-Z* [National Legal Internet Portal. 2017. 52-Z]. Available at: <https://pravo.by/document/?guid=3871&p0=H11700052> (Accessed: 03.02.2021). (In Russian).

<sup>5</sup> On the securities market: Law of the Kyrgyz Republic. Ministry of Justice of the Kyrgyz Republic. Available at: <http://cbd.minjust.gov.kg/act/view/ru-ru/202677/40?cl=ru-ru> (Accessed: 11.02.2021).

<sup>6</sup> O ry’нке cenny’x bumag: Federal’ny’j zakon Rossijskoj Federacii [On the securities market: Federal Law of the Russian Federation]. *E’lektronny’j fond pravovoj i normativno-texnicheskoj dokumentacii* [Electronic Fund of Legal and Regulatory and Technical Documentation]. Available at: <http://docs.cntd.ru/document/9018809> (Accessed: 15.02.2021). (In Russian).

<sup>7</sup> Instrument [Tool]. *Tolkovy’j slovar’ Ozhegova* [Ozhegov’s Dictionary]. Available at: <https://clck.ru/TYCMv>. (Accessed: 08.02.2021). (In Russian).

*implement their functions in a strictly defined algorithm sequence, respectively, without human involvement and triggered upon and in accordance with the agreement of the parties.*

It should be noted that in defining the digital form of financial instruments and mechanisms, we focus on the legal aspect of fixing these concepts in the current legislation. The absence of relevant legal provisions in national and international law creates barriers to the widespread use of digital financial instruments due, for example, to the lack of a legal basis for the consideration of disputes arising in business practice.

Based on the proposed full definition of digital financial instruments and financial mechanisms, we will formulate a simplified version of this definition: *these are digital financial models for the implementation and settlement of financial relations of economic transaction participants as set forth in the applicable laws.* Based on this definition, we consider, for example, the use of smart contracts in the system of international settlements or insurance activities [13; 14].

The financial relations themselves are known to arise from the moment of signing the transaction by the parties, which is inextricably linked with the legal aspects of conducting economic activity. The completion of any transaction, and, consequently, financial relations, is associated with the economic nature and is expressed in the form of entries in the accounting accounts. Cash, bills of exchange, securities and others can then be regarded as instruments for the realisation of financial relations, i.e. we are talking about a simple payment.

In this regard, in the era of digitalization, a smart contract can and does become such a digital financial instrument. The authors of the study define a smart contract as a *digital model of financial relations with a legal basis in the form of a transaction concluded between participants on the basis of applicable national legislation or international law, which strictly establishes the rights, obligations and conditions of these relations for each of the participants, and the sequence of their implementation as separate operations, and formalized as a computer program (algorithm), providing for the maintenance of the register (protocol, report) of executed operations, which is launched and executed automatically in accordance with the conditions set by the program without the possibility of intervention or stopping the implementation of financial relations of the parties to the transaction after the algorithm in operation until their completion, unless force majeure circumstances arise.*

In this definition, we focus on the technical aspect — the execution procedure of a smart contract, through which many financial transactions can be implemented and optimised.

The use of a smart contract makes it possible to transfer funds electronically. This is already being implemented on the well-known website AliExpress<sup>1</sup>. There is an Escrow Account, which stores the buyer's funds transferred for the goods. When the recipient is informed that the goods have been delivered, the funds are transferred to the seller's account. All actions are carried out automatically.

By analogy, we take the example of the "Auto-Payment" service, which is available at virtually any bank. A customer who agrees to have his account debited to a specific beneficiary for services provided (utility bills, loan payments, etc.) enters into a public offer with the bank, stipulating all the terms of the transaction. The funds are debited from the account on the appointed date in favour of the beneficiary; if there are insufficient funds in the account, the client's order is not executed. In this situation, a conditional operator acts, which is the main characteristic of a smart contract.

As practice shows [15], these are not the only examples of the use of the smart contract as a digital financial instrument.

The international letter of credit form of settlement using the smart contract is gaining popularity in many countries. This is where a category such as the digital letter of credit already stands out. Digital letters of credit are in operation at HSBC and Dutch ING Bank<sup>2</sup>, Alfa Bank<sup>3</sup> Ошибка! Закладка не определена., BPS Sberbank<sup>3</sup> and some others.

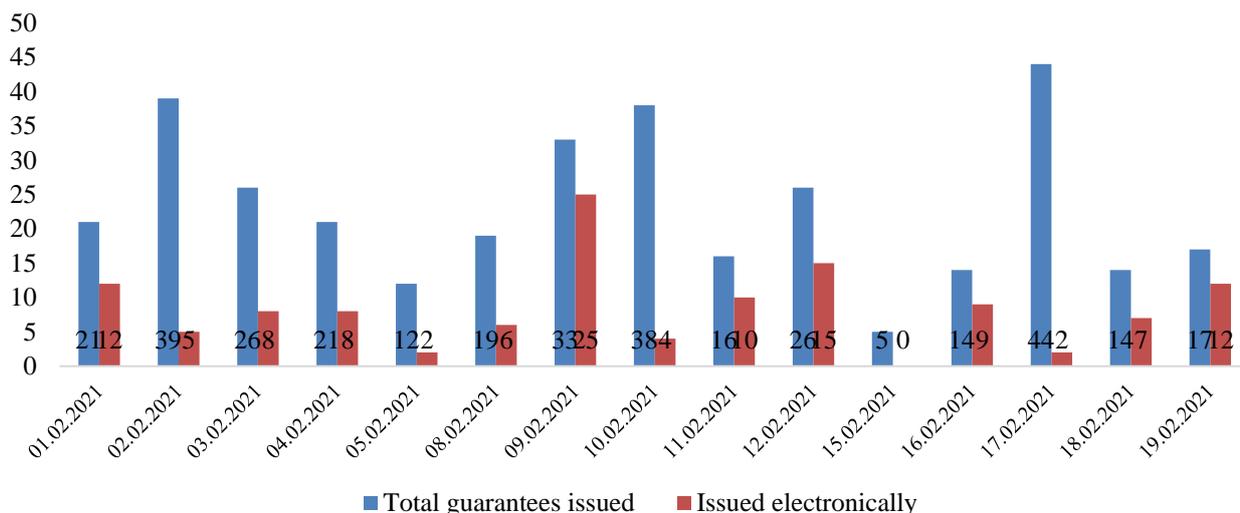
The smart contract is applicable in securing guarantees. For example, according to the National Bank of the Republic of Belarus<sup>4</sup> 311 bank guarantees were issued between 01 February and 19 February 2021 (figure), of which more than 50% were issued via blockchain, including in favour of customs authorities.

<sup>1</sup> Making payment on AliExpress. Available at: <https://www.buyqualityng.com/making-payment-aliexpress/> (Accessed: 16.02.2021).

<sup>2</sup> Mir na blokcheyne: gde uzhe primenyaetsya novaya texnologiya [The world on blockchain: where the new technology is already being applied]. *Forbes* [Forbes]. 2018. Available at: <https://www.forbes.ru> (Accessed: 14.02.2021). (In Russian).

<sup>3</sup> Texnologiya Blockchain prishla v Belarus` [Blockchain technology has come to Belarus]. *Tut.by*. 2017. Available at: <https://news.tut.by> (Accessed: 13.02.2021). (In Russian).

<sup>4</sup> Reestr bankovskix garantij [Register of bank guarantees]. *Nacional'nyj bank Respubliki Belarus* [National Bank of the Republic of Belarus]. Available at: <https://www.nbrb.by> (Accessed: 17.02.2021). (In Russian).



**Figure 1 — Information on guarantees issued in total and electronically for the period 01.02.2021-19.02.2021, number**

Source: Own elaboration based on National Bank data Ошибка! Значение не определено.

The first blockchain-based bank guarantee in Belarus was issued on 21 January 2019<sup>1</sup> and in favour of customs authorities on 16 July 2020<sup>2</sup>. Until then, all guarantees were issued in paper form.

What is so interesting about the smart contract and the blockchain technology on which it is based? Primarily, these technologies provide greater data security because there is no need for intermediaries and therefore no access to sensitive information by third parties.

The terms of a smart contract, the information recorded in the blocks is not subject to change [16], and thus it becomes possible to better protect the terms of the transaction from adjustments

All operations are performed automatically, so that payment and information processing is accelerated and the human factor is eliminated. At the level of an individual organization, these facts contribute to the acceleration of turnover of current assets by accelerating the timing of product sales, at the level of the state — in the increase of GDP and the general welfare of the population.

### Results of the study and discussion

The definitions of “digital economy”, “digital financial instrument”, “digital financial mechanism”, and “smart contract” formulated in this study, with a focus on its financial and economic sides, allow for a certain conceptual apparatus. Moreover, emphasis is placed on the lack of interpretation of these definitions in the legislative framework of Belarus in particular and the EAEU in general, which hinders the dissemination of the achievements of the digital economy. It is necessary to improve and unify legislative acts in order to increase business confidence and technology security and to protect entrepreneurs themselves in the event of disputes accompanying a transaction.

The definitions formulated in this study, with a focus on the economic side of digital technology, provide a better definition of how financial relationships can be regulated with the least risks and losses for each party.

The benefit of digital financial instruments to the parties to the transaction and to the government is that digital technologies, by accelerating the timing of product sales, increase labour productivity, which has a positive impact on the welfare of the population and the country’s GDP.

Assessing the economic effect requires the development of a different systematic approach from the traditional one, because the effect of digital technology is achieved at both the micro and macro levels, and to

<sup>1</sup> Vy`pushhena pervaya bankovskaya garantiya s primeneniem texnologii blokchejn [First bank guarantee using blockchain technology issued]. *Nacional`nyj bank Respubliki Belarus`* [National Bank of the Republic of Belarus]. 2019. Available at: <https://www.nbrb.by> (Accessed: 09.02.2021). (In Russian).

<sup>2</sup> Pervaya v strane blokchejn-garantiya v pol`zu tamozhenny`x organov vy`pushhena Belinvestbankom [The country’s first blockchain guarantee in favour of customs authorities was issued by Belinvestbank]. Belinvestbank [Belinvestbank]. 2020. Available at: <https://www.belinvestbank.by> (Accessed: 15.02.2021). (In Russian).

date there is no single methodology for assessing the effect of digital technology. This is a prerequisite for highlighting this area for further research.

When estimating the economic effect, the cost to the state of social assistance programmes for the unemployed must also be taken into account. The introduction of digital technology will inevitably be accompanied by a reduction in the number of jobs. Entrepreneurial structures, as agreed, will benefit from an increase in their marginal product. There are obstacles from a national perspective, as maintaining unemployment at natural levels is also a strategic objective of any country. In the case of digitalisation, the number of unemployed will certainly increase, which will require some expenditure by the state. Therefore, this fact should be taken into account when developing a methodology for estimating economic effects.

### Conclusion

- Despite the high rate of implementation of digital technologies in all spheres of activity and the proclamation of the digitalization era, the conceptual apparatus of this economic phenomenon has not yet been fully formed. In this regard, our proposed definitions of the digital economy, digital financial instruments and mechanisms, considered from the perspective of financial relations, seem to be timely and relevant;

- The formation of a conceptual framework for digital financial instruments and their consolidation as a paradigm for digital development makes it possible to form a unified approach to the understanding and use of digital instruments, which results in the preparation and legal enshrinement of procedures and norms for their use in global practice. Ultimately, this translates into faster international settlements and higher global GDP;

- It is no secret that, with the pronounced global trend towards “digital development”, the use of digital tools is one of the main factors in enhancing the competitiveness of national economies. However, the use of digital technologies has a double effect. The positive economic effect is associated with shorter periods of technological cycles of production, higher productivity of equipment, etc. At the same time, the negative economic effect of the use of digital technology is at the state level in the form of increased budgetary expenditures for activities related to the support of the released workforce and the need for additional measures for their social support. In this regard, attention is drawn to the need to develop a new systematic approach for a comprehensive assessment of the total cumulative effect of digital technologies, as a single methodology in this area has not yet been developed.

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