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Blockchain, Digital Assets and Currencies: Modern Aspects of Use and Accounting in the Russian Federation

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Abstract

The primary objective of the research is to conduct a detailed examination of blockchain and digital financial assets, including their classification and methodology. Additionally, research addresses the key risks associated with assessing and reflecting digital assets in financial reporting, providing recommendations for managing these risks. Furthermore, attention is payed to mining activities in the Russian Federation, the existence of legislative gaps in this field and potential solutions to these issues. Various theoretical and practical research methods were used to achieve the results: analytical method to study the fundamental concepts and classification of digital financial assets; observation, comparison, experiment for risk analysis and development of recommendations in the field of accounting and reflection of digital assets; normative-legal method to study legislative gaps and propose possible solutions; comparative analysis to compare legislation in the Russian Federation and other countries. The research results include a detailed study of the concept of digital assets, their classification and methodology, analysis of identified risks, development of management measures, study of mining and legislative gaps, as well as proposal of solutions to improve legislation and accounting methods. This research holds significance for entrepreneurs actively using or planning to integrate digital assets, as well as for professionals engaged in blockchain and digital assets' utilization in business practices and their reflection in accounting and financial reporting.

Keywords: Blockchain, Cryptocurrency, Digital Assets, Mining, Risks in Financial Accounting.

Introduction

There is abundant evidence that for toady the market is experiencing significant fluctuations driven by the instability of the global economy and geopolitical tensions. Some industries are facing challenges due to sanctions and trade wars between countries, which leads to reducing investments and uncertainty in the business environment. International conflicts and political crises cause investor uncertainty and impact market supply and demand. Simultaneously, technological advancements continue to transform the market. The integration of artificial intelligence, blockchain, big data and other innovative technologies provides new opportunities for businesses and society. However, some companies and industries encounter difficulties in adaptation and competition due to the rapid evolution of technologies.The emergence of digital assets and other technologies initially evoked mixed reactions in Russia. Until 2020, society mainly held a negative opinion about virtual alternatives to traditional instruments in life. For instance, in 2014 the Central Bank of Russia issued a press release which cautions against about using digital activities, but at the same time not prohibits it at all (1). Nonetheless, who would have anticipated that after a few years, digital alternatives would successfully integrate into the life of society while causing the pandemic, technological advancements and the geopolitical conflicts? However, the issue of lacking legislative frameworks in the mining sector in Russia has become prominent in recent years. Simultaneously, other countries have developed legislative bases in this area, provided guidelines for the rational reflection of companies' assets in the fields of mining, using digital currencies, digital assets, both in accounting and taxation. Cryptocurrency mining, such as Bitcoin, gained

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popularity in just a few years, and many countries have not yet developed appropriate legislation for regulating this industry. This situation creates uncertainty and risks for companies involved in mining area and using digital assets, which could lead to tax and financial security violations. Nevertheless, mining development continues to progress actively. Companies are developing new methods and technologies to enhance resource extraction efficiency and reduce costs. However, competition in this market is intensifying as more players enter the game, striving to benefit from the growing demand for cryptocurrencies and blockchain technologies. The global landscape of blockchain and digital asset accounting has evolved significantly, with various countries adopting distinct approaches to blockchain adoption and financial reporting. Notably In 2021, The Bank of America estimated that 14% of US adults owned digital assets, with an additional 13% planning to buy that same year. Irrespective of this record, there is no specific accounting term addressing digital assets, and the low proportion of firms that disclose their digital asset holdings has led to the interpretation of digital assets by the International Accounting Standards Board (IASB) as currently not significant (2). In Dubai, a fintech haven, the UAE DMCC (Dubai Multi Commodities Centre) in partnership with the SCA (Securities and Commodities Authority) established an onshore crypto assets regulatory framework. These regulations were put in place to ensure the protection of investors and curtail money laundering activities. In October 2020, the SCA legally transferred all operational and executive powers and competencies to licensed commodity markets while maintaining the regulation and supervision of the local financial market. In the same period, the UAE Central Bank issued a regulation on stored value facilities (SVF) to facilitate fintech firms and non-bank payment service providers (3). In September 2021, El Salvador made history by embracing the Bitcoin cryptocurrency as legal tender. According to the law passed on that day, for ease of accounting of the digital/crypto assets, the US dollar will continue to be used as a reference currency and the USD-to-bitcoin exchange rate will be freely determined by market forces (4, 5). In China, digital asset accounting is heavily regulated with a comprehensive ban on financing practices related to blockchain digital assets and cryptocurrency issued in September 2017. This regulation also prevents non-fungible tokens (NFTs) from being used for financial risk, prevents trading with virtual currency, and hopes to issue a digital currency in the form of Digital Reminbi, a digital currency issued and regulated by the People's Bank of China, which has the feature of controlled anonymity and does not require a bank account to use it (6). In brief, the advancement of digital technologies in the Russian Federation, especially in the financial sphere, is rapidly evolving. Therefore, the conceptual framework requires a detailed exploration of new digital objects in terms of legislation and the reflection of economic activities involving them in accounting and disclosure in financial statements for external users. The main goal of the research is a detailed examination of the concept of digital financial assets and blockchain, their classification, and methodology. To achieve the research goal and obtain objective results, the following tasks are set:

- Studying fundamental concepts, classification of blockchain and digital financial assets.
- Analysis of risks associated with the assessment and reflection of digital assets in financial statements.
- Development of recommendations for risk management regarding digital assets.
- Identification main methodological differences between digital financial assets and digital currencies.
- Studying areas of application digital currencies in the Russian Federation.
- Studying mining activities in the Russian Federation and identification of legislative gaps in this sphere.
- Examination of the main approaches to assessing audit risk during audits.
- Proposal of possible solutions for legislative gaps in the field of mining.
- Consideration of possible methods for reflecting digital assets in accounting.

Methodology

The lack of clear legislation and standards in accounting for digital assets creates uncertainty and risks in reporting. The novelty of topic requires deep understanding in technology and financial processes, which makes it difficult to

develop standards and adopt a uniform accounting methodology. To achieve the goals and objectives of the study, the following research methods and approaches were used:

Data Collection

An extensive literature review was conducted on the topic of the use of block chain, digital assets and digital currencies in Russia. There were analysed scope of different scientific articles, publications on the Internet, reports of central banks, legislative documents and publications in specialized journals. Data was collected through Scopus and Web of Science; we chose articles from 2020 to 2024 years of relevant topics. The DFA received a legislative framework in Russia in July 2020 against the backdrop of the rapid development of digitalization and crypto currencies in the world. Then Law No. 259-FZ "On digital financial assets, digital currency and on amendments to certain legislative acts of the Russian Federation" (7) was adopted. Thus, in the context of the Russian Federation, the greatest activity in the study of digital financial assets by scientists and economists can be witnessed after 2020 and first legal act release.

Comparative Analysis of Legislation

In the Russian Federation, there is currently a single regulatory act on accounting for digital financial assets in force, which is expected to be amended in the near future regarding the digital rubble, crypto currencies, and mining activities: "Federal Law "On Digital Financial Assets, Digital Currency, and Amendments to Certain Legislative Acts of the Russian Federation" dated 31.07.2020 No. 259-FZ" (7). Additionally, on December 7, 2023, the State Duma of the Russian Federation passed in the third reading Draft Law No. 384598-8 "On Amendments to Parts One and Two of the Tax Code of the Russian Federation and Certain Legislative Acts of the Russian Federation on Taxes and Fees (on integrating provisions on the digital rubble into the tax legislation of the Russian Federation)" (8). This draft law establishes the concept of a digital ruble account in the Tax Code of the Russian Federation, as well as the taxation procedure for an account opened by a digital ruble platform operator based on a digital ruble account agreement (similar to a bank account). As of 2024, there is no accounting or tax standards in the Russian Federation for digital financial assets, cryptocurrencies and mining activities. International Financial Reporting Standards (IFRS) do not contain a specific standard solely dedicated to the accounting of crypto currencies or digital assets. However, guidance can be found in existing standards such as IFRS (IAS) 38 (Intangible Assets), IFRS (IAS) 2 (Inventories), IFRS (IAS) 21 (Effects of Changes in Foreign Exchange Rates), and IFRS 9 (Financial Instruments). In conducting a comparative analysis of legislation in this area, legislative methods for reflecting both accounting and financial aspects of digital assets in different countries were studied. For instance, Japan distinguishes itself, as the Accounting Standards Board of Japan (ASBJ) was one of the first to create a practical official accounting guidance for virtual currencies. The preliminary version was published on December 6, 2017. After a 2-month discussion, the ASBJ presented the final version. A month later, the guidance was presented at the Accounting Standards Advisory Forum (ASAF), and starting from April 1, 2018, Japanese crypto dealers began applying it in practice (9). Unlike in other countries, Japanese methodologies currently recognize crypto currencies as a new independent asset category for accounting purposes. This recognition of crypto currencies as an independent asset category helps companies in Japan more effectively account for and manage digital assets in their operations, providing greater clarity and transparency in financial reporting. Such an approach also contributes to establishing consistent accounting standards for crypto currencies in the country, ultimately enhancing trust in companies' financial data and promoting the development of the digital economy.

Case Study

To illustrate specific situations and examples of blockchain and digital asset usage in the Russian Federation, case studies were conducted on practical examples. All these methods helped achieve the research's goals and objectives, ensuring an objective and comprehensive examination of modern aspects of blockchain, digital assets, and currency usage and accounting in Russia.

Results

The concept of digital assets in the Russian Federation has a clear regulatory definition. In

accordance with the Federal Law dated July 31, 2020 No. 259-FZ art. 1para. 2, digital financial assets (DFAs) include digital rights, emission securities, equity participation rights in joint-stock companies, and other assets accessible through information systems, including blockchain (7). A distributed ledger, commonly known as blockchain, is a database that is stored and synchronized across multiple nodes or computers in a network. Each block in the chain contains a set of transactions, metadata, and data from the previous block, forming a continuous and immutable chain, minimizing information tampering. Operators of information systems issuing digital financial assets play a crucial role in ensuring the stable and secure operation of digital financial systems. They provide a platform for the issuance, accounting, and exchange of digital assets (tokens) based on blockchain technology, available only to Russian legal entities included in the Bank of Russia's OIS registry. As of January 2024, the registry includes 10 legal (10). Digital financial assets (DFAs) are considered as digital analogs of existing financial instruments such as stocks, bonds, promissory notes, and others. They represent digital rights or certificates that operate based on blockchain technology, ensuring transaction transparency, uniqueness and security. Digital representation of value is a virtual equivalent of cash. One of the examples of such representations is digital currencies, which include:

- Virtual Currencies: unregulated currencies controlled by founders or developers consisting of interested parties. An example could be a network token.
- Central Bank Digital Currencies: regulated digital currencies issued by the central bank of a country aiming for more effective control of the shadow economy, cross-border operations with other countries (11), reduced costs of administering budget payments, financial market development (creating new financial products and services, payment infrastructure development (12)), providing an alternative to crypto currencies lacking a single issuer.
- Crypto Currency: a digital currency based on block chain technology without a centralized control system (13). Crypto currency emerged in 2009: the first 50 bitcoins were generated, followed by the first transaction and the transfer of crypto currency to national currencies. Nine months later, New Liberty Standart set the exchange rate of bitcoin to the dollar (1$ = 1309BTC). Analysts argue that the creation of a decentralized currency was driven by distrust of fiat currencies and the desire to maintain confidentiality.

Therefore, the primary difference between DFAs and digital currencies is that the former represent digital rights, while currencies mean electronic data without legal backing, although they differ from centralized money as all transactions are stored on a public blockchain, ensuring decentralization, transparency, global access, limited issuance and high volatility. Currently, there are three areas of applying digital currencies, especially crypto currencies as can be seen in Figure 1: Financial operations, Passing restrictions and Daily operations. Each of the main areas has purpose of use and methods of use listed.

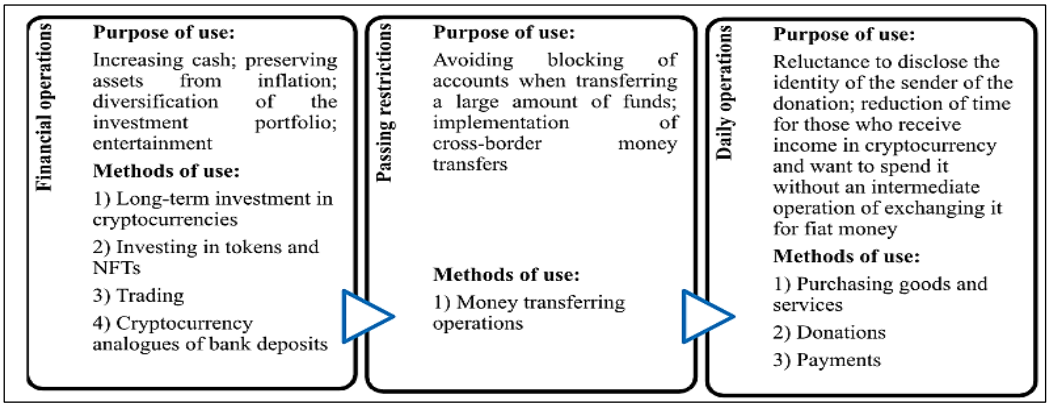

Figure 1: Main Areas of Applying Crypto Currency in the World

According to Russian Federal Law dated by July 31, 2020 No. 259-FZ, Art. 4Para. 5 crypto currency is legalized: ownership, buying, selling, earning from operations with crypto currency are

permitted, but accepting it as a means of payment is prohibited (7). In countries like Japan, Canada and others this restriction does not even exist (14). Entities with Public Accountability (EPA) are defined under the International Auditing and Assurance Standards Board's (IAASB) standards rather than the International Financial Reporting Standards (IFRS). These entities typically include publicly traded companies, financial institutions, insurance companies, organizations holding assets in a fiduciary capacity, those involved in securities trading, and state-owned enterprises accountable for public funds.(15). According to Russian Federal Law No. 307-FZ, Article 5.1, public interest entities encompass public joint-stock companies, organizations with securities admitted to organized trading, credit institutions, insurance organizations, mutual insurance companies, professional securities market participants, state corporations, companies with at least 25% state ownership, and other specified organizations (16). The Audit Directive (2006/43/EC) includes organizations considered as public-interest entities (PIEs) in Europe (17). These are entities governed by the laws of a Member State, with transferable securities admitted to trading on a regulated market within the meaning of Directive 2004/39/EC (18). It also encompasses credit institutions as defined in Directive 2013/36/EU (19), excluding those explicitly exempted in Article 2 of that Directive. Additionally, it covers insurance undertakings as per Directive 91/674/EEC and other entities designated by Member States as public-interest entities due to their business nature, size, or workforce significance (20). All these organizations are united by the main characteristic - direct or indirect involvement in commercial activities with an unrestricted circle of persons. Mining is the process of extracting digital currency using specialized equipment, which involves verifying and confirming transactions through solving complex mathematical problems. In Russian Federation, there was an attempt of releasing law on mining, which was planned for 2023, but has not been introduced. Although the number of such activities is increasing in Russia. The lack of legal regulation allows companies to bypass audit procedures and accounting, leading to a lack of transparency in information about these operations. This study explores the possibility of categorizing organizations involved in mining activities as Entities with Public Accountability (EPA) according to Russian Federal Law dated December 30, 2008 No. 307-FZ, art 5 (16). This means that the risks inherent in the activities of public interest entities have consequences for their not only owners, debtors, and creditors, but indirectly for a significant part of society, including the state (21). Moreover, organizations engaged in mining activities pose a significant risk to the state due to illegal fund leakage, the absence of a legislative framework in this area, as well as negative impact on the environment of the entire society due to the large carbon footprint from mining activities. In accordance with Russian Federal Law dated July 31, 2020 No. 259-FZ Art. 1 clause 2, we propose the following classification of DFAs: subdivided into 3 main types of DFA, highlighting their distinctive features, disadvantages, positive aspects and examples (Table 1, 22).

Table 1: Classification of DFA According to Federal Law dated July 31, 2020 No. 259 (7)

Basis for Comparison	DFAs with Monetary Claim	DFAs Associated with Issuance of Securities	Hybrid Type of DFAs
Definition	This type gives the right to demand funds from the issuer of the DFA on the terms specified in the decision to issue the DFA	Digital forms of traditional securities (bonds, shares, depositary receipts and others). This type of DFAs transfers rights or obligations using blockchain technologies.	This type combines the features of different financial instruments, offering a combination of their advantages with improved liquidity and financial flexibility
Distinctive Features	Decentralization: DFAs with monetary claim due to basing on	Decentralization: DFAs associated with issuance of securities are based on the	Variety: Hybrid DFAs can include a variety of financial instruments,

	decentralized systems ensure accessibility and transparency for consumers. Independence: establish direct financial relationships between participants in transactions, bypassing intermediaries	principles of decentralization, which improves the availability of securities for their preservation. Reducing Intermediaries: using blockchain system reduce the number of intermediaries and simplify the trading and accounting processes.	providing greater flexibility in choosing financial strategies. Cross-platform: exist on various additional platforms, which completes their transmission and circulation.
Positive Aspects	Accelerate Transactions: provide fast and efficient financial transactions with low fees. Global access: used for international transfers with minimal costs and delays	Improved Liquidity: offer faster and safer asset liquidity. Reducing Costs: issuing and servicing on the blockchain can reduce the costs of storing and recording them	Diversification: provide access to a variety of financial options combined into one DFA. Flexibility: flexibility in managing and using different financial strategies
Negative Aspects	Volatility: exposed to volatility, which creates risks for using and implementing Cybersecurity: high interest in digital money also attracts cyber threats	Legal and Regulatory Risks: transfer and execution requires strict compliance with legislation. Cybersecurity: exposed to cyber-attacks and theft	Complexity: creating and using hybrid DFAs is more challenging and require more expertise
Examples	1. DFA for gold or other metals 2. Raising funds by the company for a certain period at an interest rate	1. Bond tokens (issued in the form of tokens) 2. Tokenized shares in the form of digital tokens that facilitate their transfer and accounting	1. Tokenized investment portfolios, combined in the form of digital assets on the blockchain. 2. Packaged investment products that combine the characteristics of various financial instruments

Table 2: Classification of Risks Associated with Digital Asset Operations

Types of Risks	**Definition**
Legal	- Amendments to legislation regulating the use of digital assets which may have a negative impact on market participants; - Lack of a unified international legislative base leading to different interpretations of the legality of such operations with digital assets; - lack of unified standards (they are developed in different languages and not interconnected), complicating asset transfers;
Geopolitical	- Sanction risks for non-residents; - Loss of foreign capital due to restrictions for foreign investors;
Technological	- Loss of access to the wallet: The development of digital assets is in the early stages, that is why investors face a high risk of asset loss; In case of a key loss, the operator of information systems must restore wallet access, thus, the security of digital asset owners is dependent on information system operators. - Potential shortcomings: System failures, equipment malfunctions, lack of access to

	digital assets;
Cyber	- Cyber-attacks (notably "51% attacks"). If fraudsters capture 51% of the blockchain, control is in their hands. In such a case, asset manipulations will appear as ordinary transactions; - Theft of Operational system personal data. Due to blockchain having access to user wallets, data leaks within the information system operator can easily occur, risking clients' money;
Financial	- Volatility: Cryptocurrencies exhibit substantial price fluctuations, posing risks for investors and businesses. Sudden swings can impact investment portfolios. - Liquidity Risk: Difficulty in swiftly trading digital assets without affecting prices. Limited liquidity can lead to unfavorable transaction outcomes. - Counterparty Risk: Deals with the chance of the other party not meeting obligations, especially in unregulated platforms, potentially resulting in asset loss. - Market Risk: Exposure to losses due to adverse market movements caused by regulatory changes, economic shifts, or technological advancements impacting asset valuations. - Regulatory Risk: Uncertainties from regulatory changes impacting the legality and operations of digital assets, introducing compliance challenges and affecting financial results.
Specific Risk of Data Immobility	Once information is stored in a blockchain, it's challenging to modify or erase. Incorrect data entries, like property ownership records, can be difficult to rectify without the approval of most network participants. This feature can lead to persistent errors and complications in data maintenance and integrity.
AML/CFT	Inadequate regulations to combat illicit money flows and terrorism financing through tokenized securities increase the risk of unknowingly transferring illegal funds within the blockchain ecosystem. This absence of specific safeguards can inadvertently facilitate criminal activities within digital asset transactions.

Due to the specific risks that arise during the circulation of digital assets, which need to be assessed (23), a table has been developed to help identify them more effectively (Table 2). We recommend the following methods for identifying risks associated with digital transactions:

Matrix Risk Assessment Model: The Matrix Risk Assessment Model involves creating a matrix to systematically evaluate risks associated with digital transactions. This method typically categorizes risks and their potential impacts, providing a structured framework for risk assessment. Each risk is assessed based on various criteria, such as likelihood and impact, to prioritize and address risks effectively. By using a matrix format, this model allows for a clear representation of risks and their relationships within the digital transaction environment.

Analytical Hierarchy Method (Saaty Method): The Analytical Hierarchy Method, often referred to as the Saaty Method, is a decision-making technique used to prioritize risks by pairwise comparisons. It involves breaking down complex problems into simpler pairwise comparisons to derive relative weights for different criteria or risks. By comparing risks against each other on a scale, this method helps in structuring priorities and making informed decisions regarding risk management strategies in digital transactions. The Saaty Method provides a systematic approach to processing subjective judgments and preferences to arrive at a priority order for addressing risks.

Monte Carlo Method Simulation: The Monte Carlo Method Simulation is a mathematical technique used to model uncertainties and risks in digital transactions through repeated random sampling of inputs. By conducting simulations based on random variables and their distributions, this method generates numerous possible outcomes to analyze the potential impacts of digital transaction risks. The Monte Carlo method is valuable for assessing complex systems where risks are influenced by multiple variables and uncertainties, offering a

comprehensive view of potential risks and their implications in digital transactions.

We conducted a case study for the sake of practical application of the risk assessment method related to digital asset operations, on the following simulated scenario:

"There was a decision to open a coffee shop in the base format (a coffee bar with a small number of seats), with costs totaling 2,000,000 rubles. Due to selling tokens, this amount was successfully raised. The next question arises: the probability of losing funds exceeding 1,700,000 rubles when faced with risks such as:

- Cyber Risk (losses of 700,000 rubles)
- Technological Risk (losses of 250,000 rubles)
- Financial Risk (losses of 300,000 rubles)
- Legal Risk (losses of 200,000 rubles)
- Specific risk of data immobility (losses of 130,000 rubles)
- Geopolitical Risk (losses of 110,000 rubles)
- Each risk can vary by 10%."

Evaluation Procedure: After calculating the loss ranges for each risk, they are input into Excel, and random values are generated within these ranges. All results are then summed using the SUM formula. The sum, as well as the values for each risk upon recalculation, changes. The result demonstrates the maximum expenses from the occurrence of risks, helping to determine whether they exceed 1,700,000 rubles or not. However, a single row does not provide a definitive answer, as each outcome varies. It is necessary to implement constraints using an IF formula to output values of 1 or 0. A value of 1 indicates that the monetary losses are ≤1,700,000 rubles, while a value of 0 signifies otherwise. By summing the events where the losses were ≤1,700,000 rubles, a result of 58% was obtained. This implies that there is a 58% chance that token losses will amount to ≤1,700,000 rubles. Additionally, a graph can be constructed, showing that the most likely monetary losses will fall within the range of 1,689 – 1,715.8 thousand rubles (Figure 2). Figure 2 shows a horizontal bar chart illustrating the probability of financial loss across various values on the vertical axis. The values range from 1555 to 1823 in increments, likely indicating financial metrics or periods. Each horizontal bar represents a different range of probabilities, with the longest bars suggesting the highest likelihood of financial loss at specific points, while shorter bars indicate lower probabilities at other intervals.

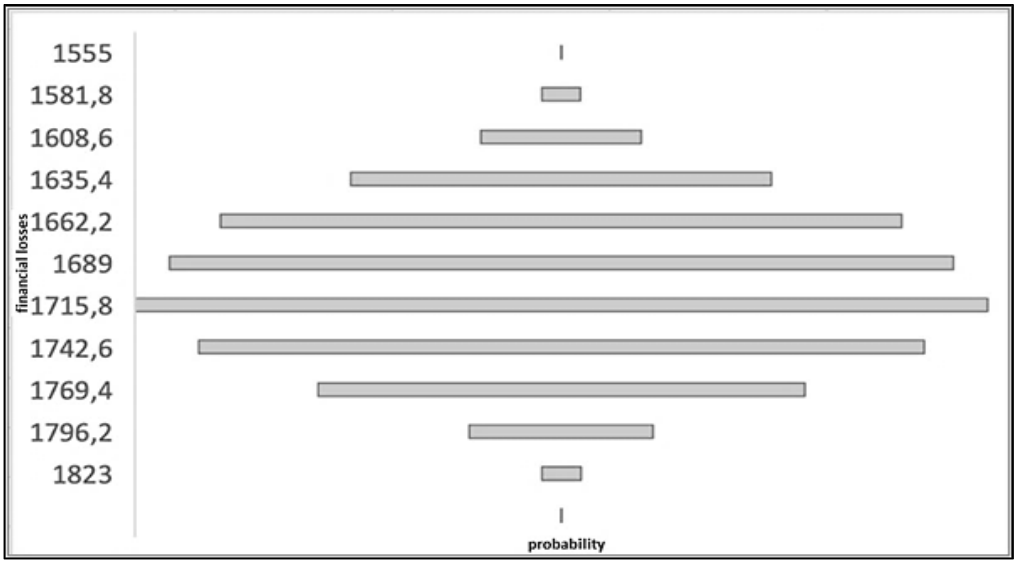

Figure 2: Graph of Probability of Financial Loss

It can be concluded that DFAs and the risks associated with them are difficult to assess and manage. The difficulty is in the fact that most of them are external risks, but also in the lack of statistics and experience of past years. At the same time, knowledge and understanding of these risks allows to act more rationally, taking into account all the factors that negatively affect the company and develop measures to prevent them. In addition, research resulted in making a hypothesis of categorizing organizations involved in mining, digital financial assets (DFAs) and cryptocurrencies according to Art. 5.1 of the Federal Law "On Auditing" as Entities with Public

Accountability, driven by significant public interest in the activities of these organizations (16). Specialized risk assessment and audit approaches are crucial for conducting audits of organizations involved in cryptocurrency-related activities. Key aspects to consider include gaining a thorough understanding of the organization's business model, such as cryptocurrency transactions, participation in ICOs (Initial Coin Offerings) or STOs (Security Token Offerings), crypto loans, or mining activities. It is also essential to evaluate internal control and security procedures, including key storage, transaction verification processes, asset protection mechanisms, and compliance with cryptocurrency regulatory standards. Additionally, financial reporting and cryptocurrency accounting must be reviewed to ensure the entity's financial statements accurately reflect these assets and transactions in accordance with relevant reporting standards, such as IFRS or GAAP. Identifying and addressing audit risks requires specialized approaches, including innovative methods to establish acceptable levels of risk (refer to Table 3).

Table 3: Detection of Acceptable Level of Audit Risk

Standard Function	Suggested Calculation Formula
AR = Ri+Rc+Rd, AR = Acceptable Audit Risk, Ri = Inherent Risk; Rc = Control Risk; Rd = Detection Risk.	AR = Ri × (Rc+Rd), AR = Acceptable Audit Risk, Ri = Inherent Risk; Rc = Control Risk; Rd = Detection Risk.

According to International Standard on auditing 200 13 (c) Audit risk (AR) is a function of the risks of material misstatement and detection risk (24). Ordinary audit processes may require modification of existing tools for specific aspects of this activity. Suggested calculation formula separately takes into account inherent risk, due to the reason that inherent risk may be more significant in the context of mining activities, DFA realization with specific characteristics, such as cryptocurrency price dependency, technological risks. At same time, control risk is initially low due to the nature of the DFAs and a transparent blockchain system, which allows reducing detection risk. However, control risk and detection risk still play an important role since these two aspects may be interconnected and lead to consequences upon error detection. This formula enables auditors to have a more comprehensive view of audit risk specific to such activities.

Compliance Verification: Ensuring the organization complies with all regulatory acts in the cryptocurrency field, including Anti-Money Laundering (AML) and Combating the Financing of Terrorism (CFT). The next legislative gap with DFAs is that existing accounting standards in the Russian Federation as for 2024 do not meet the requirements for conducting activities in the field of DFAs, mining, digital currencies and related activities due to the following reasons: unique characteristics of cryptocurrency activities give a reason to inaccurately reflection in existing accounting standards; insufficient regulatory framework regulating the conduct and accounting of cryptocurrency operations; the technological nature of cryptocurrency requiring adaptation of existing accounting standards and implementation of specialized approaches; volatility and other risks require the development of special accounting approaches. Therefore, for the utmost informativeness of public financial accounting, it is suggested to add a separate mandatory item on electricity costs in the Income Statement (as these costs constitute the main cost of operations), as well as information on expenses related to payments according to electricity tariffs; to separately disclose this information in the explanatory notes to the financial statements. Due to the lack of guidance on how to reflect DFAs in Russian Federation Accounting Systems, we implement methods of reflecting DFAs and digital currency in accounting taking into account foreign experience and international standards (Table 4).

Table 4: Possible Ways of Reflecting DFAs in Russian Accounting System

Inventories	Intangible Assets	Financial Investments	Cash and Cash Equivalents
Selling Crypto Financial Assets (CFA) as part of normal business activities, cryptocurrencies are considered as inventories and should be accounted in accordance with IAS 2 and Federal accounting standard in the Russian Federation (25, 26). For instance: cryptocurrency produced during a specific cycle may be recognized as finished goods. However, if organization engages in their resale, they treated as goods acquired from other parties for sale in the ordinary course of business. In this case, the amount of expenses incurred in connection with the acquisition or creation of the digital asset must be determined.	The revaluation model in IAS 38 applied to digital assets classified as Intangible Assets (IA) if there is an active market (26). However, determining its existence can be challenging. Another complexity is that digital assets classified as IA typically have an indefinite period of use and are valued at cost less impairment losses. This raises numerous practical questions, such as: - Determining the value upon receipt of the asset in exchange for goods or services; - Impairment testing (and recovery of impairment losses in accordance with IFRS standards), including fair value assessment. Recoverable amounts are subject to the volatility of the value of digital assets. When digital assets are classified as inventories in accordance with IFRS standards, but the company is not a broker-dealer, they are valued at the lower of cost and net realizable value. Another significant condition for classification as IA is compliance with the requirement of para. 4 of Federal accounting standard in the Russian Federation 14/2022 - usage for a period of more than 12 months (27).	CFA for the purpose of generating income or long-term investment can be considered as financial investments: they are reflected in the accounting at fair value or at the initial cost with subsequent evaluation of the impact on financial results. Thus, in accordance with Accounting Regulation 19/02 in Russian Federation and meeting all conditions of para. 2, recognition of DFAs as a financial investment is possible if: - Intended for long-term investment, for example, with the intention of generating income from changes in their value over an extended period; - Used to generate income from exchange rate differences; - Digital assets acquired by the company for speculative purposes, such as trading on cryptocurrency exchanges (28).	According to Federal Law No. 259-FZ of July 31, 2020, Article 14, para. 7, the use of digital currencies as payment for goods and services provided is prohibited in the Russian Federation (7). Therefore, despite cryptocurrency being a fairly liquid asset, it cannot be classified as legal tender in Russia. Accounting for transactions for goods (works, services) using cryptocurrency is better carried out as follows: 1. Debit “Inventory” Credit “Accounts payable” - goods (works, services) received/performed; 2. Debit “Accounts payable to other creditors” Credit “Miscellaneous income” - cryptocurrency has been written off from the balance sheet; 3. Debit “Miscellaneous outcome” Credit “Financial investments” - cryptocurrency has been written off as a financial investment; 4. Debit “Accounts payable” Credit “Accounts payable to other creditors” - mutual offset has been successfully completed.

Besides the above-mentioned risks and legislative gaps, it was observed when registering a company engaged in the realization and creation of digital assets, there is no initial answer to an important question: which code from Russian Classification of Economic Activities to indicate for the company's activities (The concept of All-Russian Classifier of Types of Economic Activities means classifying unique code for every legalized economic activity. Many countries have their own

similar classification systems, which are used to classify economic activities and code enterprises by industry. For example, in the United States there is the NAICS (North American Industry Classification System), in the European Union - NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) or in the UK - SIC (Standard Industrial Classification). Each of these systems provides codes that help identify types of economic activity and facilitate the analysis of statistical data). After studying the operations of the largest companies in the Russian Federation within this industry, we created a table outlining various methods for utilizing codes during the company registration process (Table 5, 29).

Table 5: Possible Options for Indicating when Registering an Organization Conducting Activities in the Field of Digital Financial Assets in Russian Federation

Organizations Engaged in Mining Digital Currencies (Crypto currencies) in Russia	Organizations Engaged in Leasing Out Mining Equipment in Russia, Manufacturing Specialized Equipment and Programs, Data Registries	Organizations Engaged in Reselling Digital Assets
1. 09.3 "Other mining and quarrying" Explanation: Mining is associated with the generation of new tokens/coins, hence the activity may be classified under mining and quarrying of minerals. 2. 72.40 "Data processing, hosting, and related activities; web portals" Explanation: Mining digital currencies can be carried out in a professional data processing center, making this activity essentially a form of cloud computing. Therefore, it should be regulated similarly to data processing centers. 3. 62.09 "Other information technology and computer service activities"	1. 62.03.13 Computer facilities management activities 2. 61.10.3 Telecommunications service activities, including internet access services 3. 62.01 Computer programming activities 4. 62.02 Information technology consultancy and other related activities 5. 63.11 Data processing activities, web hosting, and related activities 6. 63.11.1 Creation and use of databases and information resources	62.09 "Other information technology and computer service activities". However, this code encompasses various activities involving technology. Therefore, each company's situation needs to be individually examined to determine the appropriate classification.

Discussion

Our study lays emphasis on the necessity for updated legislative and accounting standards that accommodate the uniqueness of digital financial assets (DFAs), cryptocurrencies, and mining activities. Current regulations on digital assets lag behind technological advancements, creating significant gaps that expose businesses to risks such as tax evasion, cyberattacks, financial insecurity, and a lack of operational transparency. This agrees with the opinions of recent studies (30). Our study offers a practical framework for risk assessment, applying tools such as the Matrix Risk Assessment Model (31), Analytical Hierarchy Method (32), and Monte Carlo Method Simulation (33), which businesses and auditors can use to identify and manage risks effectively. Additionally, our findings provide insights on classifying DFAs into categories like monetary claims, securities issuance, and hybrid forms, providing businesses with tools to better understand and manage their assets, thereby enhancing operational efficiency and financial reporting. Theoretically, our study agrees with the quantitative analysis of other scientists and contributes to the broader discourse on the integration of digital assets into mainstream financial systems (34, 35). It establishes that DFAs and cryptocurrencies represent a transformative asset class, warranting a re-evaluation of traditional accounting practices. Furthermore, the study accentuates the need for an interdisciplinary approach, comprising of financial, technological, and regulatory

perspectives to address the rapidly evolving field of digital assets and cryptocurrency. It also highlights that the volatility and rapid technological evolution of digital assets demand innovative accounting strategies. Our study emphasizes the dual necessity of practical and theoretical actions to address the limitations posed by digital financial assets. By bridging the gaps between legislation, accounting standards, and technological innovation, the study hopes to provide a roadmap for policymakers, businesses, and academics to navigate the complexities of digital assets, especially in countries where legislative and regulatory frameworks remain underdeveloped. We compared research results with relevant domestic and foreign studies published over the past five years on key aspects of accounting for digital financial assets, including recognition, classification and audit risks to companies working with digital assets. Before the entry into force of the Federal Law on the DFAs assigned digital assets to financial investments according to para. 2 Order of the Ministry of Finance of the Russian Federation from 10.12.2002 No. 126n “On approval of the Accounting Regulations "Accounting of financial investments" 19/02” and indicated the most appropriate account for the cryptocurrency 58 “Financial Attachments” (36). Currently, in the 2024 cryptocurrency is already the main activity for some companies in Russian Federation, whereas in 2019 this activity had no legal justification and particular popularity. In this way, in 2024 cryptocurrency cannot be unequivocally attributed only to financial investments due to its unique nature and diverse using in various business spheres. In addition to the category of financial investments, the cryptocurrency can also be classified into various other categories depending on its functional purpose and specific use (above is a table of possible ways of reflection). In the 2020 study it was proposed to include DFAs in addition to financial investments also to inventories that can be equated to the category of goods when they are purchased and received for sale (37). It was confirmed that the relevance of our research in terms of incorrectness of reflection of cryptocurrency to current assets, especially “cash and cash equivalents” (38). International Audit and Consulting Corporation KPMG (39) similarly express the opinion that the accounting treatment of digital assets and currency is ambiguous: the reflection in accounting largely depends on the business model of the company and the characteristics of assets. In addition to the important research conducted by the above-mentioned authors, it is also essential to consider other significant scientific studies in the field of digital financial assets and digital currencies. These research findings eventually highlight the need for the development of additional normative acts, specifically in relation to accounting and tax standards for digital financial assets and digital currencies (40).

Conclusion

The research conducted with the aim of detailed examination of blockchain and digital financial assets, their classification and methodology, risk analysis and development of recommendations, represents a significant contribution to the field of digital assets and their accounting. The research highlights several critical findings. It delves into the concepts and methodologies related to blockchain and digital financial assets, offering a comprehensive understanding of their structure and operational principles. A systematic classification and methodology for analyzing digital assets are provided, facilitating standardized approaches to their assessment and accounting. Significant risks associated with the valuation and accounting of digital assets are identified and analyzed, accompanied by recommendations for effective management, contributing to enhanced financial stability. The study underscores its relevance not only for Russian entrepreneurs using digital assets and blockchain but also for foreign entrepreneurs, offering practical solutions and recommendations. It identifies regulatory gaps in areas such as mining and proposes measures to address these issues, emphasizing security and compliance. Furthermore, the research stresses the importance of a specialized and proactive focus on risk management, given the complexity and novelty of digital assets, to ensure financial transparency and organizational stability. The research emphasizes that the increasing use of digital assets requires particular attention to their accounting, risks and legislative aspects, the need for effective risk management and measures to

ensure legal and financial accountability in the realm of digital financial assets. It is worth noting that blockchain and digital assets introduce unique risks to companies' financial reporting following their recent integration into the business environment. This includes price volatility, market risks, information security and changes in legal regulation. The assessment and accounting of digital assets require specific focus on managing these risks and establishing control mechanisms for their mitigation.

Abbreviations

IASB: International Accounting Standards Board, SVF: Stored Value Facilities, NFTs: Non-Fungible Tokens, DFAs: Digital Financial Assets, IFRS : International Financial Reporting Standards, ASBJ: Accounting Standards Board of Japan, ASAF: Accounting Standards Advisory Forum, EPA: Entities with Public Accountability, IAASB: International Auditing and Assurance Standards Board, PIEs: Public-Interest Entities, ICOs: Initial Coin Offerings, STOs: Security Token Offerings, AR: Audit Risk, AML: Anti-Money Laundering, CFT: Combating the Financing of Terrorism, CFA: Crypto Financial Assets, IA - Intangible Assets.

Author Contributions

Authors contributed to the manuscript equally.

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Conflict of Interest

Authors have no conflict of interest to declare.

Ethics Approval

Not applicable.

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References

1. Bank of Russia. Press release of the Central Bank of the Russian Federation "Using virtual currencies, particularly Bitcoin, when making transactions". 2014 Jan 27. Available from: https://www.cbr.ru/press/pr/?file=27012014_1825052.htm
2. Jackson AB, Luu S. Accounting for digital assets. Aust Account Rev. 2023;33(3):302–12.
3. Schilirò D. Fintech in Dubai: development and ecosystem. Int Bus Res. 2021;14(11):61.
4. Gorjon S. The role of cryptoassets as legal tender: the example of El Salvador . Banco de Espana Article 35/21; 2021 Oct 7. Available from: https://ssrn.com/abstract=3944765
5. Gaikwad A, Mavale S. The impact of cryptocurrency adoption as a legal tender in El Salvador. Int J Eng Manag Res. 2021;11(6): 112-115.
6. Hu X. The Necessity and Overall Significance of the Development of Digital RMB in China. In: Advances in Economics, Business Management Research, Atlantis Press; 2022 Dec 27. p. 1242–1146. Available from: https://doi.org/10.2991/978-94-6463-098-5_140
7. Federal Law No. 259-FZ. Digital inancial assets, digital currency and on amendments to certain legislative acts of the Russian Federation. State Duma of the Federal Assembly of the Russian Federation, July 31, 2020. https://rg.ru/documents/2020/08/06/tsifra-dok.html
8. State Duma of the Federal Assembly of the Russian Federation. Legislative draft No. 384598-8 "On amendments to parts one and two of the Tax Code of the Russian Federation and separate legislative acts of the Russian Federation on taxes and charges (on the integration into the legislation on taxes and charges of the Russian Federation of provisions on the digital ruble)". 2023. Available from: https://sozd.duma.gov.ru/bill/384598-8
9. Accounting Standards Board of Japan. Accounting for virtual currencies. 2018 Mar. Available from: https://www.ifrs.org/content/dam/ifrs/meetings/2018/april/asaf/asaf-03a-virtual-currencies-asbj-presentation-april-2018.pdf
10. Bank of Russia. Register of information system operators that issue digital financial assets as of 10.11.2023. 2024 Jun. Available from: https://cbr.ru/finm_infrastructure/digital_oper/
11. Plotnikova LA. Features of the internal control of foreign trade transactions. Mediterr J Soc Sci. 2015;6(1S3):379-83.
12. Rubanov VV, Mashegov PN. Features of the country's foreign exchange policy in the world economy, in: Materials of the International Science Conference "Science Education Practice". 2023; part 1: 79–85. https://doi.org/10.34660/INF.2023.66.67.076
13. Investopedia. Digital currency types, characteristics, pros & cons, future uses. 2023. Available from: https://www.investopedia.com/terms/d/digital-currency.asp
14. CryptoCloud. Top 10 countries for cryptocurrency use. 2023 Feb 22. Available from: https://cryptocloud.plus/blog/top-10-crypto-friendly-stran
15. Ashley M. Definitions of listed entity & public interest entity. IAASB Virtual Meeting. IESBA. 2020 Jul 22. Available from: https://www.ifac.org/_flysystem/azureprivate/meetings/files/20200722-IAASB-Agenda-Item-1-A-PIE-Presentation-July-2020.pdf
16. State Duma of the Federal Assembly of the Russian Federation. Federal Law No. 307-FZ "On auditing". 2008 Dec 30. Sobranie Zakonodatel'stva Rossiiskoi Federatsii [SZ RF]; Moscow; 2009 Jan 5. Available from:https://www.TOnsultant.nj/document/cons_doc_LAW_83311/?ysdid=lqdp24mhu602046855

17. The European Parliament and of the Council. Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts. 2006 May 17. The European Parliament and the Council; Brussels; 2006 May 17. Available from: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:157:0087:0107:EN:PDF
18. The European Parliament and of the Council. Directive 2004/39/EC on markets in financial instruments. 2004 Apr 21. The European Parliament and the Council; Brussels; 2004 Apr 21. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02004L0039-20110104
19. The European Parliament and of the Council. Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms. 2013 Jun 26. The European Parliament and the Council; Brussels; 2013 Jun 26. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0036
20. Nagumanova RV, Erina TV, Sabirova AI. The impact of tax risk indicators on the company's market capitalization. Journal of Environmental Treatment Techniques. 2019. 7(Special Issue):1082–1088.
21. SBERCIB. Introduction to digital financial assets. 2023 Jun 16. Available from:https://journal.tinkoff.ru/media/sbercibvvedenie-v-tsifrovye-finansovye-aktivy.jqxtzfe9sauk..pdf
22. Muradyan SV. Digital assets: legal regulation and estimation of risks. J Digit Technol Law. 2023;1(1):123-51.
23. International Federation of Accountants. International standard on auditing 200 "Overall objectives of the independent auditor and the conduct of an audit in accordance with International standards on auditing". 2023. Available from: https://minfin.gov.ru/ru/document/?id_4=116572-mezhdunarodnyi_standart_audita_200_osnovnye_tseli_nezavisimogo_auditora_i_provedenie_audita_v_sootvetstvii_s_mezhdunarodnymi_standartami_audita&ysclid=lw9mx8kkwf159858760
24. International Financial Reporting Standards Foundation. International accounting standard (IAS) 2 "Inventories". 2015. Available from: https://minfin.gov.ru/common/upload/library/2016/02/main/IAS2.pdf?ysclid=lw9mpfp7h8678698250
25. Vashisth A, Salako K, Pinto P. Digital assets valuation and financial reporting. In: CRC Press eBooks.2024;2784(1):93–114.
26. International Financial Reporting Standards Foundation. International accounting standard (IAS) 38 "Intangible assets". 2015. Available from: https://minfin.gov.ru/ru/document/?id_4=15329-mezhdunarodnyi_standart_finansovoi_otchetnosti_ias_38_nematerialnye_aktivy&ysclid=lw9m9hhbdb856624114
27. Ministry of Finance of the Russian Federation. Order No. 126n "On approval of the Accounting Regulations 'Accounting for Financial Investments' 19/02". Rossiiskaia Gazeta. 2003 Jan 9. Available from: https://cis-legislation.com/document.fwx?rgn=6342
28. Ministry of Finance of the Russian Federation.Order of December 10, 2002, No. 126n "On approval of the Accounting Regulations 'Accounting for Financial Investments' 19/02". Rossiiskaia Gazeta [Ros. Gaz.] 2003 Jan 9, No. 2. https://cis-legislation.com/document.fwx?rgn=6342
29. Rosstandart. OK 029-2014 All-Russian classifier of types of economic activities. Moscow: Standartinform; 2014. Available from: https://www.consultant.ru/document/cons_doc_LAW_163320/
30. Hasilova NG, Yerina T. Digital asset accounting. In: International Youth Symposium on Management, Economics and Finance. Collection of scientific articles. Kazan: Kazan University Publishing House; 2019; 1:414-7.
31. Salisu S, Egen C. A framework for digital asset transaction roundtrip risk evaluation. In: 5th International Conference on Blockchain Computing and Applications. Institute of Electrical and Electronics Engineers Inc. 2023. https://doi.org/10.1109/bcca58897.2023.10338912
32. Rodríguez M, Crespo Márquez A, Guillén López AJ, Candón Fernández E. General bases to hierarchy definition for digital assets in railway context. In: Crespo Márquez A, Seecharan TS, Abdul-Nour G, Amadi-Echendu J, editors. Advances in asset management: strategies, technologies, and industry applications. Engineering Asset Management Review. 2024;3:127–45.
33. Li Z, Su J, Xu M, Yuen J. A framework for digital asset risks with insurance applications. 2024. arXiv:2408.17227. Available from: https://arxiv.org/abs/2408.17227.
34. McNulty D, Milne AKL, Williams J, Wood JA. Digital assets in payments and transaction banking. SSRN. 2024. Available from: https://doi.org/10.2139/ssrn.4928001
35. Ministry of Finance of the Russian Federation. Order of November 15, 2019, No. 180n "On approval of the Federal Accounting Standard FSBU 5/2019 'Inventories'". 2019 Nov 15. Available from: http://publication.pravo.gov.ru/Document/View/0001202003260005?ysclid=lw9mjw7whk763225348
36. Ministry of Finance of the Russian Federation. Order of May 30, 2022, No. 86n "On approval of the Federal Accounting Standard FSBU 14/2022 'Intangible assets'". 2022 May 30. Available from: http://publication.pravo.gov.ru/Document/View/0001202206280008?ysclid=lw9m3p703i932462797
37. Fedorenko LA. Digital financial assets as assets of accounting. Ekonomika i sotsium. 2020;9(76):383-6.
38. Ilma IR, Kulikova LI. Cryptocurrency as a new object of accounting. Vesti nauchnykh dostizheniy. Bukhgalterskiy uchet, analiz i audit. 2020;2:81-4.
39. KPMG. Digital assets under IFRS Standards and US GAAP: the basics. Understanding cryptocurrencies and other crypto assets and the accounting they issues raise. 2022 Sep 6. Available from: https://

Rosstandart com/us/en/articles/2022/digital-assets-ifrs-standards.html
40. Turmanov MT, Rogulenko TM. The impact of digital technologies on the information potential of accounting (financial) statements. Part 1: the concept of assessing the information content of corporate reporting, the model of digitaliasation of assets, liabilities and their impact on the information potential of reporting. Vestnik Universiteta. 2022;1(7):129-37.