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## Insurance of virtual assets: problems of theory and practice

### Страховання віртуальних активів: проблеми теорії та практики

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Written by:

**Liudmyla Biletska<sup>1</sup>** <https://orcid.org/0000-0002-5081-610X>**Oleh Kulyk<sup>2</sup>** <https://orcid.org/0000-0003-1195-9869>**Ihor Shumak<sup>3</sup>** <https://orcid.org/0000-0003-3799-7476>

#### Abstract


Many companies use large volumes of virtual assets to run their business, but traditional insurance products are not effective enough to address the unique challenges of virtual assets. In addition, legal regulation in this area is dynamic and ambiguous. This shows that the study of the insurance of virtual assets is an urgent task, as it responds to the modern challenges associated with digital technologies and creates a basis for the development of effective strategies and tools in the field of insurance.

The purpose of the study is to clarify problematic issues in the theory and practice of insurance of virtual assets. The research methodology consists of the following methods: legal analysis method, empirical method, historical method, concept analysis method and argumentation analysis method, system method, analogy method, induction and deduction method.


It is concluded that classic insurance products may be inadequate to solve the unique risks of virtual assets, while there is a need to develop new insurance products that take into account digital threats and losses, becoming a necessity. In addition, the lack of a clear legal framework in the field of insurance of virtual assets creates a consequential gap, and, therefore, the need to develop and implement standards and regulations has become an urgent task for the diversification of legal regulation.

#### Анотація

Багато компаній використовують великі обсяги віртуальних активів для ведення свого бізнесу, однак класичні страхові продукти є недостатньо ефективними для вирішення унікальних викликів віртуальних активів. Крім того, правове регулювання у даній сфері є динамічним та неоднозначним. Це свідчить про те, що дослідження проблем страхування віртуальних активів є актуальним завданням, оскільки воно відповідає на сучасні виклики, пов'язані з цифровими технологіями та створює базу для розробки ефективних стратегій та інструментів у галузі страхування. Метою дослідження є з'ясування проблемних питань у теорії та практиці страхування віртуальних активів. Методологію дослідження складають такі методи як: метод правового аналізу, емпіричний метод, історичний метод, метод аналізу понять та метод аналізу аргументації, системний метод, метод аналогії, метод індукції та дедукції. Підсумовано, що класичні страхові продукти можуть бути неадекватними для вирішення унікальних ризиків віртуальних активів, при цьому, існує необхідність у розвитку нових страхових продуктів, що враховують цифрові загрози та втрати, стає необхідністю. Крім того, відсутність чіткої правової рамки у сфері страхування віртуальних активів створює важливий прогалину, а тому наголошено на необхідності розробки та впровадження

<sup>1</sup> Ph. D., Associate Professor of the Law Department of the Lviv Institute "Higher Educational Institution" Interregional Academy of Personnel Management", Ukraine.  WoS Researcher ID: KII-9777-2024

<sup>2</sup> PhD in Law, Associate Professor at the Department of International Law and Branch Legal Disciplines, Kyiv University of Law of the National Academy of Sciences of Ukraine, Kyiv, Ukraine.

<sup>3</sup> Ph.D. in Law, Associate Professor of the Department of Intellectual Property and Private Law, Faculty of Sociology and Law, National Technical University of Ukraine "Ihor Sikorsky Kyiv Polytechnic Institute", Ukraine.  WoS Researcher ID: KII-2805-2024



**Keywords:** cryptocurrency, virtual assets, insurance, security, stability, financial market, problematic issues, digital resources.

стандартів та нормативів стає актуальною задачею для урізноманітнення правового регулювання.

**Ключові слова:** криптовалюта, віртуальні активи, страхування, забезпечення, стабільність, фінансовий ринок, проблемні питання, цифрові ресурси.

## Introduction

In the conditions of rapid development of digital society and technological innovations, the issue of ensuring the security of virtual assets is becoming increasingly meaningful. The growing use of digital platforms and virtual tools in business, personal life, and other areas leads to the emergence of new risks that require study and resolution by the insurance sector. Insurance of virtual assets becomes a complex and urgent problem both for the theory and practice of insurance. At the same time, numerous challenges and issues arise related to the development of adequate insurance strategies, perseverance of insurance premiums, risk assessment, and determination of responsibility in conditions of digital uncertainty. In essence, virtual asset insurance opens up a wide area for research in the fields of finance, technology, and legal regulation. With the growing interest in this direction, it becomes noteworthy to develop not only theoretical concepts but also practical tools to ensure the effective functioning of the insurance system of virtual assets in conditions of uncertainty and rapidly changing technological landscape.

The object of research is the insurance of virtual assets, namely the concept, legal regulation, and problematic issues in scientific doctrine and practical application.

This study focuses on the fundamental aspects of the problems and possible ways to solve the issues of insurance of virtual assets, covering both theoretical and practical aspects of this vital issue in the context of today's digital world.

The tasks of the research are as follows:

1. To analyze the features of virtual assets and their regulation in modern conditions.
2. Pay attention to the issue of legal support for insurance of virtual assets.
3. Investigate problematic issues of insurance of virtual assets and consider ways to solve them.

The article consists of an abstract, introduction, methodology, literature review, main text, conclusions and a list of used literature.

The following specific terms were used during the study:

Virtual assets are a term that covers any digital instrument that has a generated value and is suitable for exchange or use for specific purposes.

Insurance risks - a certain event for which insurance is provided and which has signs of probability and randomness of occurrence.

Cryptocurrency is a digital currency designed to work as a medium of exchange through a computer network that is not reliant on any central authority, such as a government or bank, to uphold or maintain it.

Token - a unit of account, which is not a cryptocurrency, intended to represent a digital balance in some asset, in other words, performing the function of a "substitute for securities" in the digital world.

## Theoretical framework or literature review

The research of Arkhireyska (2021) analyzed the regulatory and legal regulation of virtual assets in Ukraine. According to the scientists, the issue of regulating the activities of participants in the virtual assets market should be referred to the competence of the NBU and the National Securities and Stock Market Commission. The author also noted that the adoption of the law "On Virtual Assets" is a significant step by the authorities to regulate the market of virtual assets, including the crypto industry.

Antoniv (2022) turned his attention to insurance during the war. In particular, the author came to the conclusion that insurance contracts are valid regardless of the introduction of martial law in Ukraine, with standard force majeure clauses that are also applied in other types of contracts. Instead, the researcher draws attention to the fact

that, as a rule, insurers do not cover "war" risks and exclude war zones and territories not controlled by the government from the insurance territory.

Chichkan (2021) conducted an analysis of the place and importance of state social insurance in the modern system of social protection of the population, indicating the complexity and ambiguity of approaches in this area. It was concluded that, on the one hand, mandatory social insurance is considered as the basis and optimal way of organizing the social protection system, which is based on historical experience, international standards and is recognized in the scientific works of many modern scientists (as stated above). On the other hand, the level of material support provided through mandatory social insurance is not high enough and indicates the need to immediately find ways to improve the functioning of this system.

Behal (2023) considered crypto-insurance as a protection tool. The author notes that there are already mechanisms in the world to insure the risks of crypto companies, including several crypto insurance companies that provide insurance services for cryptocurrency assets and other risks related to cryptocurrencies. However, this market is new and not very developed, so some companies may face problems of receiving insurance payments in case of risks. In Ukraine, for example, such a system does not work at all, and insurance companies do not offer crypto-risk insurance. In another study, Behal and Zarazhevska (2023) reviewed European regulations for cryptos. Ukraine is preparing a new law on virtual assets.

Features of crypto-currency insurance in Ukraine are considered in the work of Gavrilyuk (2019). The major opinion of the author is that the profitability and growth potential of cryptocurrency capitalization, as well as high risks, necessitate the development of an insurance mechanism in the crypto industry. The development of insurance opportunities corresponding to the realities of the development of the digital economy is becoming one of the essential tasks of both the domestic and global insurance industry, which allows for the stable growth of cryptocurrency markets and the digital economy.

Kryvoshlyk and Shkurchenko (2022) investigated the types of cryptocurrency insurance in the world. In particular, it is stated that the types of insurance include: insurance of cryptocurrency storage; crime insurance; general

business insurance for cryptocurrencies; and insurance for decentralized finances. In another work, Kryvoshlyk and Dymnich (2022) investigated cryptocurrency insurance under conditions of legal uncertainty. It was remarked that the future development of cryptocurrency insurance depends entirely on the conditions of legal regulation of the cryptocurrency market in general in the world and, in particular, in Ukraine.

In the study of Lytvyn (2023), the main provisions of the law on the circulation of virtual assets were analyzed. The author has analyzed in detail the issue of taxation and the risks of payments with virtual assets.

Additionally, Makarov & Arzhevitin (2022) examined virtual assets in the context of monetary policy. It is noted that the introduction of the e-hryvnia into circulation as a monetary policy tool with interest accrual will significantly strengthen the interest channel of monetary transmission and contribute to the achievement of the goals set by the central bank and the growth of non-inflationary monetization of the economy. At the same time, the introduction of a third form of money into circulation would probably give rise to new risks, which are proposed to be mitigated by proper parameterization of the new form of money.

Nagaychuk and Tretyak (2018) analyzed the possibilities of using blockchain technology in insurance. It was concluded that the use of blockchain technology in the field of organization of service for policyholders will enable insurers to achieve positive financial results by reducing costs, primarily liquidation, and collection, and increase the efficiency of the company's activities in general. Pavlysh (2022) drew attention to the fact that insurers began to refuse clients who have assets on the FTX exchange.

The question of the future of cryptocurrencies was investigated by Panfilova (2021). The conducted research showed that cryptocurrencies and digital assets will continue to be the subject of intensive reformative legal regulation, will be in the field of scientific research and will be affected by global economic changes.

The object of Poplavskyi (2016) research is cryptocurrency as an object of economic analysis in insurance companies. It is concluded that at the moment the analysis of cryptocurrencies in insurance companies is not of practical interest in Ukraine due to the position of the state regulator.

Shinkarenko, Rogova, and Panivnyk (2018) drew attention to the peculiarities of regulatory regulation of cryptocurrencies in foreign countries. At the current stage of regulatory development, it can be remarked that there are no unified standards for the regulation of cryptocurrencies in any jurisdiction and each central bank and authorized body is guided by its approaches: from formal permission or the application of general principles of regulation in the field of payments to the complete protection of such activities.

Finally, Miravalls (2021) and Qureshi (2022) investigated the issue of virtual currency insurance and concluded that it is an essential tool for ensuring business and wallet security.

Therefore, from the above analysis of the literature, it can be concluded that currently there are problematic issues regarding the insurance of virtual assets, in particular, the recognition of virtual assets as insurable, as well as the predictability of insurance risks, etc. At the same time, a number of scientists noted that the use of blockchain technology in the field of organization of policyholder service can be progressive and effective in the activities of an insurance company. In general, all authors agree that in today's environment, virtual currency insurance is an important tool to ensure the security of businesses and wallets.

### **Research methodology**

To investigate the problematic issues of insurance of virtual assets, various methods of scientific research were used.

**Legal analysis:** By using the method of legal analysis, the regulatory regulation and legislation related to insurance of virtual assets was investigated. In particular, the provisions of Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU), the Law of Ukraine "On Virtual Assets"<sup>17</sup> and the draft Law on Amendments were analyzed to the Tax Code of Ukraine and other legislative acts of Ukraine regarding the regulation of the turnover of virtual assets in Ukraine. Overall, the legal analysis indicates that while there are some regulatory frameworks in place for virtual assets in Ukraine and the EU, specific provisions addressing the insurance of virtual assets may be lacking. There is a need for further development and refinement of laws and regulations to ensure adequate protection for individuals and businesses holding

virtual assets and to facilitate the growth of the insurance market in this area.

**Empirical method:** The empirical method made it possible to conduct several observations on the change in the attitude of countries to cryptocurrency and its regulation. Thanks to the benefit of this research method, it was analyzed how the position regarding the need to insure virtual assets is developing. The empirical findings underscore the dynamic nature of attitudes towards insuring virtual assets and the importance of ongoing research and analysis in shaping regulatory frameworks and industry practices.

**Historical method:** The use of the historical method was reasonable for the study of insurance of virtual assets, as it allows considering the evolution of this field at different stages of the development of technology and the insurance market. With the help of this method, the stages of formation and development of insurance of virtual assets were considered, which types of virtual assets underwent changes in their insurance history, and which challenges arose at different stages were determined. The evolution of laws and regulations related to the insurance of virtual assets was also considered. Determining how the legal environment influenced the development of the insurance market and how it adapted to technological changes. The historical method provided a comprehensive understanding of the insurance of virtual assets by contextualizing its development within broader historical trends and regulatory frameworks. It shed light on the challenges faced, the adaptations made, and the trajectory of future developments in this evolving field.

**Logical analysis:** Logical research methods for solving problems and studying particular aspects of the research object played a significant role in the research. In particular, the concept analysis method was used to uncover and clearly define key terms and concepts related to virtual asset insurance. This made it possible to clarify the understanding of the research subject and create a logical basis for the analysis. The argumentative analysis method facilitated the consideration of arguments that support or refute specific claims regarding virtual asset insurance. Logical research methods enhanced the rigor and coherence of the study, enabling researchers to systematically analyze and interpret the complexities of virtual asset insurance. By clarifying key concepts and evaluating arguments, researchers advanced understanding

in this area and contributed valuable insights to the field.

**System method:** The system method made it possible to consider the insurance of virtual assets as a complex phenomenon. Thus, the interaction of various components of the system was studied, their structure was determined, and principal elements were identified.

**Analogy method:** The analogy method is utilized to compare the insurance of virtual assets with known situations. This can help in understanding the essence of the problem and exploring possible solutions. For example, an analogy was drawn between the insurance of real and virtual assets.

**Deduction method:** The use of deduction to draw logical conclusions from general rules or principles, or the help of induction to draw general conclusions from specific facts or examples, has contributed to the comprehensive investigation of theoretical and practical issues in cryptocurrency insurance. The combination of deduction and induction in the investigation of cryptocurrency insurance facilitated a holistic and nuanced analysis of both theoretical frameworks and real-world phenomena. By employing these logical methods, researchers were able to generate valuable findings and recommendations that contribute to the advancement of knowledge in the field of cryptocurrency insurance.

## Results and discussion

### *Regarding the features of virtual assets and their regulation in modern conditions*

The emergence and spread of virtual assets are attracting the attention of researchers around the world. The use of virtual assets for settlement, accumulation of capital, and obtaining speculative profits occurs against the background of competition with public fiat money. This creates competition with government fiat money, breaks the central bank's monopoly on money issuance, and poses a threat to financial stability. The issue of regulation of virtual assets is becoming extremely relevant for our country since Ukraine occupies a leading place in the world ranking of countries in possession of cryptocurrency.

Virtual assets and their circulation determine the need for insurance as an integral part of the existence of cryptocurrencies. To minimize possible losses associated with the instability of

this market, they actively consider insurance as an effective tool. Among the risks and threats that can lead to the loss of funds on crypto exchanges, the following should be considered:

- 1) Cryptocurrencies are characterized by high volatility compared to traditional assets.

In this context, insurance can help compensate for losses associated with sharp price fluctuations in the cryptocurrency market.

- 2) Cyber Attacks and Fraud.

Insurance can protect against financial losses in the event of cyber attacks and fraud.

- 3) Risks associated with attacks on infrastructure and supply chains.

Insurance helps in restoration of functioning and compensation of losses in case of hacker attacks.

- 4) Security risks associated with password theft and unauthorized access to accounts.

Insurance can provide protection against financial loss due to the compromise of personal accounts.

- 5) Use for Gambling and Money Laundering:

Insurance can help detect and prevent financial crimes in the cryptosphere.

Given these risks and the specifics of virtual assets, insurance can provide the necessary level of protection and peace of mind for cryptocurrency market participants. However, the effectiveness of this tool greatly depends on proper regulation and recognition of its relevance to modern challenges in the field of cryptocurrencies.

### *Legal provision of insurance of virtual assets*

The operation of cryptocurrency exchanges in most countries is still superficially regulated, and in some jurisdictions, there is no clear and transparent regulation at all. Some countries even ban crypto-assets entirely, but investors still find ways around these restrictions and carry out crypto-trading. In such conditions, the question arises of how to ensure the security of payments, the integrity of accounts, and the confidentiality of data. With the intensive development of technology and the increase in the number of products on the crypto market, attackers are actively trying to attack exchanges, wallets, and

accounts, using methods from password theft to financial fraud. Every day, the cryptocurrency sector faces a large number of threats, risks, and scams, and effective countermeasures are necessary. One of the possible solutions is the introduction of crypto insurance. This type of insurance can provide users, traders, and owners

of crypto exchanges with a certain level of protection and a sense of security. However, the successful implementation of crypto-insurance depends on proper regulation of this sector. Only clear and effective regulation can ensure trust and security in this direction (Behal, 2023).

**Table 1.**  
*Legal regulation of insurance of virtual assets*

Regulatory and legal regulation	Key provisions
Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937.	<p>Electronic money tokens (EMTs) – tokens representing electronic money;                      Asset-referenced tokens (ARTs) – tokens linked to assets;                      All other crypto assets (including service tokens).                      What is not included in the scope of regulation:                      Cash, deposits, financial instruments, securitization (raising funds from the placement of asset-backed securities), pension payments in the state and accumulated pension system, insurance products, and virtual assets determined by individual characteristics (NFT).</p> <p>The law is aimed at establishing rules for service providers related to the circulation of virtual assets and determining liability for violations of these rules. It is based on the current standards of the International Anti-Money Laundering Group (FATF). It is important to note that the Law does not regulate the taxation of operations related to virtual assets.                      The scope of application of the Law is limited to specific legal relationships, in particular cases when:</p> <ol style="list-style-type: none"> <li>1) The parties determined that the law of Ukraine applies to the transaction, the subject of which is a virtual asset, in whole or in part.</li> <li>2) Both parties to the transaction relating to the virtual asset are residents of Ukraine.</li> <li>3) A person conducting transactions with virtual assets in his own interests (recipient of the virtual asset) is a resident of Ukraine.</li> <li>4) In the case of providing services related to the turnover of virtual assets, the subjects of legal relations must have a registered location or a permanent representative on the territory of Ukraine.</li> </ol> <p>(Law 2074-IX, 2022)</p>
Law On virtual assets	

Data provided by Law No. 2074-IX (2022) and European Parliament (2023).

Therefore, from the above analysis (Table 1), the presence of legal regulation of virtual assets can be seen. However, this regulation does not apply to insurance.

In addition, at the beginning of November, a draft law was registered in the Verkhovna Rada, which concerns the specifics of taxation of operations with virtual assets, but does not contain provisions on insurance<sup>19</sup> (Draft Law 10225-1, 2023).

For the implementation of crypto-insurance, a special legal framework is needed, which would regulate the activities of insurance companies in the field of cryptocurrencies and take into account the interests of insurance companies in the relevant market segment (Organization for Security and Cooperation in Europe. (2022)).

It can be reasonably concluded that Ukraine currently does not have the necessary laws and by-laws that would determine the provisions on

crypto-insurance. According to experts, the crypto-insurance market needs further development and improvement of mechanisms that would take into account the specifics of the cryptocurrency business.

***On problematic issues of insurance of virtual assets and ways to solve them***

Various approaches and types of insurance are used to insure clients against the risks of virtual currencies. For example,

- 1) Insurance of the storage of virtual assets (covers losses related to the storage of cryptocurrencies, which is relevant for wallets, the passwords to which can be lost or forgotten – if the owner loses access to his wallet or cryptographic keys, the insurance can compensate for the losses).
- 2) Protection of crypto-key storage (covers the protection of crypto-key storage, which is critical for the security of crypto-currency

assets, so in case of loss or theft of the keys, the insurance company can compensate the client).

- 3) Key recovery and disaster recovery (insurance can include key recovery and disaster recovery mechanisms to ensure that the cryptocurrency owner never loses access to their assets. This can be important in situations where a password is forgotten or other unforeseen circumstances arise (Allianz Global, 2022).
- 4) Insurance against company closures and bankruptcy (if a company that holds cryptocurrency assets closes or goes bankrupt, insurance can help compensate for the loss of customers who trust this company).
- 5) Indemnity for losses from cyber attacks (insurance may cover losses caused by cyber-attacks, phishing, or other online threats that may result in loss of assets). (HCP National Insurance Services, 2022).

These types of insurance can become important for customers in the world of cryptocurrencies, where the storage and management of assets involve unique risks. Insurance products should be properly designed and regulated to provide effective customer protection in this dynamic market segment (Frost, 2022).

Crime insurance can include coverage for claims by crypto companies for loss of money, securities, inventory, and digital assets.

General business insurance for cryptocurrencies can use classic business insurance policies such as directors and officers insurance and professional indemnity insurance. These contracts can be useful for insuring a business's digital assets and cryptocurrency portfolio. Directors and officers insurance of crypto companies can protect them from claims arising from their actions taken within the scope of their duties (Risk Management, 2023).

Decentralized finance insurance for cryptocurrencies, also known as smart contract insurance, can be an important security element. Smart contracts are used to automate transactions, and a DeFi insurance policy can verify the legitimacy of the software and the correct execution of transactions according to the terms of the smart contract. This simplifies the identification of unforeseen risks and ensures the safety of participants in the cryptocurrency environment.

Although there are various types of insurance in theory, due to the complexity of operating and regulating assets, in practice many problems arise due to the peculiarity of the asset's virtuality.

Risk insurance mechanisms for crypto companies already exist around the world, including several crypto insurance companies that provide insurance services for crypto assets and other risks related to cryptocurrencies. Since this market is new and not very developed, some companies may face difficulties in receiving insurance payments in case of risks. However, such a system does not function at all in Ukraine, and insurance companies do not offer crypto-risk insurance services.

Ukraine faces challenges in the field of insurance of virtual assets, but can solve them with the help of the following measures:

- 1) Insufficient regulation: The government should develop and implement relevant regulations and legislation that will take into account the specifics of virtual assets and insurance in this area.
- 2) Lack of education: Campaigns on the conscious use of virtual assets and insurance can increase the level of education among the population and reduce risks.
- 3) Cyber Security: Ensuring a high level of cyber security is important to prevent theft and cyber attacks that can damage virtual assets. The government should develop and maintain cybersecurity standards and measures.
- 4) Financial stability of insurers: Insurance companies must have sufficient resources and financial stability to indemnify losses related to the loss of virtual assets.
- 5) International cooperation: The government should actively cooperate with international organizations and other countries to share experience and best practices in the field of insurance of virtual assets.

By implementing these measures, Ukraine can ensure the stability and protection of virtual assets of its citizens and businesses, which will contribute to the further development of the digital economy and the innovation sector.

The results of the study show that virtual asset insurance is a complex and constantly evolving issue. There are various types of insurance available, but the market is still new and underdeveloped. In Ukraine, there is no specific

regulatory framework for virtual asset insurance, which hinders the development of the market.

The findings of this study add to the existing literature on virtual asset insurance by providing a comprehensive overview of the current landscape and identifying the main challenges facing the market. The study also offers recommendations for the future development of the virtual asset insurance market.

### Conclusions

- 1) According to the first task, it was concluded that virtual assets, such as cryptocurrencies, digital tokens, and intellectual property in electronic form, represent a new class of assets that differ from traditional material resources. This is due to their digital nature, the ability to be anonymous and decentralized, high volatility, and the difficulty of determining value. This necessitates the establishment of new standards and regulations that will take into account their unique characteristics.
- 2) In consonance with the second task regarding the legal provision of insurance of virtual assets, it was supposed that the development of virtual assets requires a clear and adapted-to-reality legal framework to ensure the protection of the rights and interests of the parties in the insurance of virtual assets. Also, note that the development of international standards and cooperation in the field of insurance of virtual assets can improve the efficiency and stability of this field at the global level.
- 3) In line with the third task, the problematic issues of insurance of virtual assets were investigated, and the ways of their solution were considered. It is deduced that the increase in the number of cyberattacks and cybercrime aimed at virtual assets can be avoided with the help of the development of insurance products to cover losses from cyber threats, the expansion of cyber insurance, and the active role of insurance companies in cyber security. The problem of uncertainty in the value of virtual assets can be eliminated by using advanced methods for assessing the risks and value of virtual assets, as well as developing digital risk assessment standards. The lack of insurance products specifically adapted to the requirements of virtual assets is being overcome by the introduction of new insurance products to cover.

Therefore, insurance of virtual assets is becoming more and more relevant in the context of the development of the digital economy. However, for the proper protection of investors and users, appropriate regulation of both insurance procedures and a common understanding of the definition of "virtual assets" is necessary.

We believe that for the effective functioning of insurance of virtual assets and ensuring the protection of investors and users, it is important to develop appropriate regulation. In particular, it is necessary to clearly define in the legislation that virtual assets are the object of insurance and what are their legal characteristics. Another important condition is the standardization of the terms of insurance policies and the introduction of licensing requirements for insurance companies that provide virtual asset insurance services to ensure their financial stability and compliance with standards. Another important aspect is ensuring the systematic monitoring of the activities of insurance companies in the field of virtual assets and conducting regular audits to verify their activities and compliance with requirements, as well as ensuring the proper protection of the rights of consumers of insurance services of virtual assets, including the right to receive information about insurance conditions and the dispute resolution process. These recommendations can form the basis for the development of effective and safe regulation of insurance of virtual assets, which will promote the development of this industry and ensure the protection of investors and users. Regarding further scientific research, we consider it expedient to analyze the international legal experience of insurance of virtual assets.

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