

## REVIEW ARTICLE

# Understanding the risks associated with wallets, depository services, trading, lending, and borrowing in the crypto space

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## ABSTRACT

The crypto space offers numerous opportunities for users to grow their wealth through trading, lending, and borrowing activities. However, these opportunities come with inherent risks that need to be carefully managed to protect your assets and maximize returns. By understanding the risks associated with wallets and depository services, trading, lending, and borrowing, users can make informed decisions and enjoy the benefits of the rapidly evolving world of cryptocurrencies. This review paper analyses 43 papers for the period of 2019–2023 and proposes recommendations for policy makers. The results confirm that international regulators expect national authorities to implement a regulatory framework for digital assets comparable to those that already exist for traditional finance. For national authorities, this means having and using the powers, tools and resources to regulate and oversee a growing market. Authorities should cooperate and coordinate with each other, at the national and international levels, to encourage consistency and knowledge sharing. Market operators (exchanges), service providers, exchanges and wallets, create effective risk management structures, as well as reliable mechanisms for collecting, storing, protecting and reporting data.

## KEYWORDS

*wallets; depository services; trading; lending; borrowing*

## 1. Introduction

A digital financial asset (DFA, cryptoasset) is digital data whose ownership can be confirmed by a digital signature and whose existence can be proved using an independent system. Cryptocurrency is an independent system, and crypto assets are dependent systems, the price of which can be expressed in cryptocurrencies.

Over the past few years, regulatory attention to digital assets has increased dramatically. The growth of retail and institutional adoption has led to a rapid increase in market capitalization and extreme volatility. More recently, we have witnessed a loss of consumer confidence after a number

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of bankruptcies of foreign crypto exchanges, fraud and inefficient investment of customer funds, which immediately attracted the close attention of regulatory authorities.

The motivation of the work is in opportunities which come with inherent risks that need to be carefully managed to protect your assets and maximize returns. By understanding the risks associated with wallets and depository services, trading, lending, and borrowing, users can make informed decisions and enjoy the benefits of the rapidly evolving world of cryptocurrencies.

Digital financial assets are becoming more and more associated with the traditional financial ecosystem, having an increasing impact on financial stability. Future risks are amplified by the pace of innovation and insufficient attention to risk management. Many national authorities have publicly announced their plans to become global centers of digital assets, technologies and innovations. The European Union is at the final stage of developing regulation of new crypto asset markets. Dubai authorities are creating the world's first department dealing exclusively with DFA (Bouri, Cepni, et al., 2021; Bouri, Saeed, et al., 2021). In general, a significant number of countries are conducting research and adopting legislation to bring digital assets into line with the existing legal framework. Crypto assets were originally created to operate without control, but the lack of a reliable global regulatory framework for digital assets is detrimental to innovation and consumer protection (Hossain, 2021; Y. Huang and Luk, 2020; Ji et al., 2020).

The aim is understanding the risks associated with wallets, depository services, trading, lending, and borrowing in the crypto space.

The main finding is that the current regulatory authority and its extent, as well as gaps in application, including cross-border cooperation, are important considerations. The world of cryptocurrencies is rapidly evolving, with new services and platforms emerging regularly to cater to the growing demand for decentralized finance (DeFi) solutions. However, these innovations come with several risks, which are essential for users to understand before diving into the crypto space. This article discusses the risks associated with wallets and depository services, trading, lending, and borrowing in the cryptocurrency market (Gao, Li, and Huang, 2023; Gao, Gu, et al., 2022). One of the primary risks associated with wallets and depository services is the possibility of hacks and security breaches. Even though most wallet providers and custodial services employ robust security measures, hackers are constantly looking for vulnerabilities to exploit. A successful hack can lead to the loss of users' funds, and in some cases, the complete shutdown of the service. To mitigate this risk, users should always choose reputable wallet providers and custodial services that have a proven track record in terms of security. Additionally, users should enable two-factor authentication (DFA) and use strong, unique passwords for their accounts. Keeping the majority of funds in cold storage or hardware wallets, which are not connected to the internet, can further reduce the risk of hacks (Chen et al., 2022; Chirtoaca et al., 2020).

Another risk associated with wallets and depository services is the centralization and reliance on third parties. While some wallets and custodial services are decentralized, many still require users to entrust their funds to a centralized authority. In such cases, users are exposed to the risk of mismanagement, fraud, or insolvency of the service provider (W. Huang and Gao, 2023; Metaxas et al., 2023; Srbová et al., 2023). To minimize this risk, users should opt for non-custodial wallets or decentralized depository services, which allow them to maintain control over their private keys and funds. It is also crucial to research the reputation and credibility of the service provider before

entrusting them with your assets.

## 2. Review of literature

Many papers are studied about Market Volatility and Price Manipulation. The cryptocurrency market is known for its high degree of volatility, with prices often experiencing significant fluctuations within short periods. This volatility can lead to substantial losses for traders, especially those who engage in margin trading or use leverage. Moreover, the relatively small size and unregulated nature of the cryptocurrency market make it susceptible to price manipulation. Market players can use tactics like pump-and-dump schemes, wash trading, or spoofing to artificially inflate or deflate prices, causing other traders to incur losses (Corbet et al., 2020; Dowling, 2021a, 2021b).

To manage the risks associated with market volatility and price manipulation, traders should familiarize themselves with the market dynamics and employ risk management strategies like setting stop-loss orders and maintaining a diversified portfolio. It is also essential to stay informed about the latest news and developments in the crypto space to identify potential manipulation attempts. Cryptocurrency exchanges are a popular target for hackers, with numerous high-profile hacks resulting in the loss of millions of dollars' worth of user funds. Moreover, some exchanges have been involved in exit scams, where the operators suddenly shut down the platform and abscond with users' assets.

To mitigate the risks associated with exchange hacks and exit scams, traders should choose reputable exchanges with strong security measures, such as cold storage of user funds, regular security audits, and insurance coverage (**Table 1**). It is also advisable to diversify your assets across multiple exchanges and withdraw your funds to a secure wallet when not actively trading (Mathivanan and Balaji Ganesh, 2023; Mathivanan and Maran, 2023).

**Table 1.** Regulatory frameworks for digital assets.

Jurisdiction	Framework	Anti-money laundering/ Counter-terrorist financing	Travel rule	Stablecoins payments
United States	In process	+	+	In process
United Kingdom	In process	+	+	In process
Australia	In process	+	In process	In process
Austria	In process	+	In process	In process
Bahamas	+	+	+	+
Bahrain	+	+	–	–
Canada	In process	+	+	In process
Cayman Islands	+	+	+	+
China (Mainland)	–	–	–	–
Denmark	In process	+	–	–
Estonia	+	+	In process	–
France	+	+	+	–
Germany	+	+	+	–
Gibraltar	+	+	+	+
Hong Kong	+	+	–	In process

**Table 1.** (Continued).

Jurisdiction	Framework	Anti-money laundering/ Counter-terrorist financing	Travel rule	Stablecoins payments
Hungary	In process	+	–	–
India	–	In process	–	–
Italy	In process	+	In process	In process
Japan	+	+	+	+
Jordan**	–	+	–	–
Kuwait	–	–	–	–
Luxembourg	In process	+	In process	In process
Malaysia	+	+	+	–
Mauritius	+	+	+	+
New Zealand	In process	In process	–	In process
Oman	–	–	–	–
Panama	In process	In process	–	–
Qatar	–	–	–	–
Saudi Arabia	–	–	–	–
Singapore	+	+	+	In process
South Africa	In process	+	In process	In process
Switzerland	+	+	+	+
Taiwan	–	+	+	–
Turkey***	–	+	–	–
United Arab Emirates	+	+	+	In process

Source: PwC Global Crypto Regulation Report (2023).

In lending and borrowing there is major risk is counterparty risk. Lending and borrowing in the cryptocurrency space involve counterparty risk, which refers to the potential default or failure of the other party involved in the transaction. For example, borrowers may not repay their loans, or lending platforms may become insolvent (Häusler and Xia, 2021; Hoang and Baur, 2021; Horky et al., 2022).

To minimize counterparty risk, lenders should diversify their lending portfolio across multiple borrowers and platforms. Borrowers, on the other hand, should choose reputable lending platforms with transparent terms and conditions and a history of timely loan repayments. Most crypto lending platforms require borrowers to provide collateral in the form of cryptocurrencies, which are subject to market volatility. If the value of the collateral drops significantly, the platform may liquidate the borrower’s assets to cover the loan, resulting in substantial losses for the borrower.

To manage the risks associated with collateral volatility and liquidation, borrowers should monitor the market closely and maintain a sufficient collateral buffer to prevent liquidation. Using stablecoins as collateral can also help reduce the impact of market volatility. Lending and borrowing in the DeFi space often rely on smart contracts, which are self-executing contracts with the terms of the agreement directly written into code. However, smart contracts can contain vulnerabilities or bugs that can be exploited by hackers, leading to the loss of user funds. To mitigate the risks associated with smart contract vulnerabilities, users should only interact with lending and borrowing

platforms that have undergone thorough security audits by reputable firms. It is also essential to stay informed about potential vulnerabilities and address them promptly to protect your assets (Goodell and Goutte, 2021; Grobys and Huynh, 2021; Hamill et al., 2021; Hasan et al., 2021).

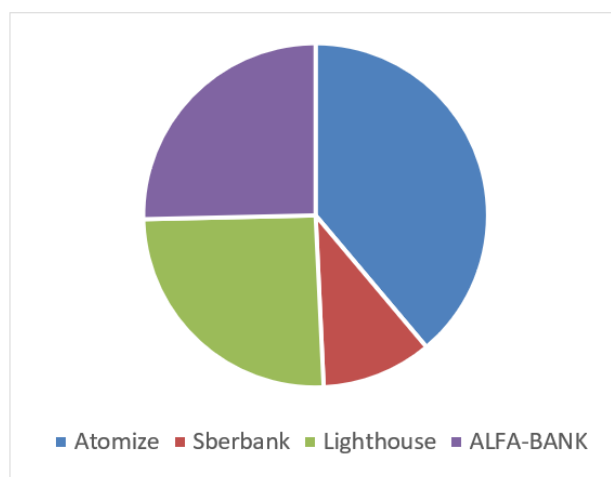
The regulatory environment surrounding cryptocurrencies is constantly evolving, with new rules and guidelines being introduced regularly. This can create uncertainties and challenges for users, wallet providers, exchanges, and DeFi platforms alike. To navigate the regulatory landscape, users should stay informed about the latest developments in their jurisdiction and comply with all applicable laws and regulations. It is also crucial to choose service providers that prioritize regulatory compliance and transparency. The comparison of based on different parameters addressed in different review papers is made by several authors (Ahmed, 2020; Kanellopoulos et al., 2021; Karim et al., 2022; Ko et al., 2022).

The tax treatment of cryptocurrencies varies across different jurisdictions, with some countries treating them as property, while others consider them as currencies or commodities. This can lead to complex tax implications for users who engage in trading, lending, and borrowing activities. To ensure compliance with tax obligations, users should consult with a tax professional familiar with the cryptocurrency space and maintain accurate records of their transactions.

### 3. Methodology

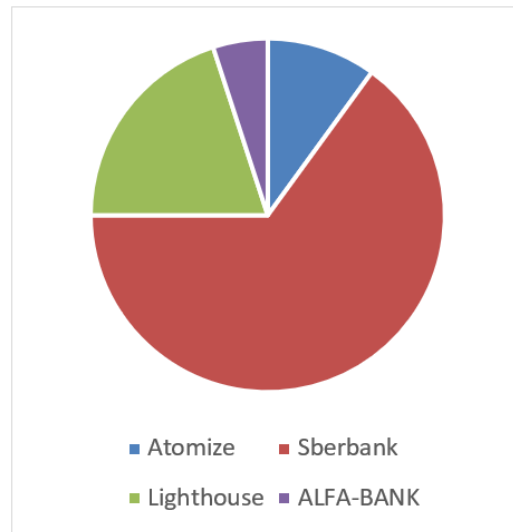
The digital asset ecosystem has reached a turning point. Many regulatory authorities around the world have either put in place schemes to regulate transactions with crypto assets like regulation of energy emissions in manufacture sector (Candila et al., 2021; Saqib et al., 2021; Yumashev and Mikhaylov, 2020).

Crypto market operators are increasingly faced with adopting more “traditional” approaches to corporate governance, compliance and risk management. As of June 2023, five Crypto market operators were registered in Russia (**Table 2, Figures 1 and 2**), the total volume of the Crypto market is about three billion rubles.



**Figure 1.** Share of DFA volume of issue, %.

Source: Bank of Russia, author's calculations.



**Figure 2.** Share of DFA numbers of issue, %.  
Source: Bank of Russia, author's calculations.

**Table 2.** Digital financial assets in Russia.

Date of inclusion	Operator	Volume of issue, million rubles	Number of Crypto issues in circulation, pcs
03/02/2022	Atomize	1150	2
03/17/2022	Sberbank	307	13
03/17/2022	Lighthouse	751	4
02/02/2023	ALFA-BANK	750	1
09/03/2023	Distributed Registry Systems	0	0

Source: Bank of Russia, author's calculations.

International regulators have set an expectation for national authorities to establish a regulatory framework for digital assets that is similar to that of traditional finance. This entails national authorities to possess and employ the necessary powers, tools, and resources to govern and supervise an expanding market. National and international authorities should cooperate and coordinate with one another to stimulate consistency and knowledge sharing. Market operators such as exchanges, service providers, and wallets should develop effective risk management structures and dependable mechanisms for collecting, storing, protecting, and reporting data (Dinçer et al., 2022; Enoksen et al., 2020; Li et al., 2022).

## 4. Findings

The main finding is that the current regulatory authority and its extent, as well as gaps in application, including cross-border cooperation, are important considerations. The world of cryptocurrencies is rapidly evolving, with new services and platforms emerging regularly to cater to the growing demand for decentralized finance (DeFi) solutions.

When a service provider combines multiple functions, it can lead to complex risk profiles and conflicts of interest like those found in other financial conglomerates. In some places, this means



certain combinations of services or functions cannot be offered within the same organization. The digital asset market poses threats to global financial stability due to its scale, structural vulnerabilities, and growing interconnectedness with traditional finance. To address these concerns, effective regulatory and supervisory systems must be based on the principle of “the same activity, the same risk, the same regulation”.

The Financial Stability Board (FSB) proposed a framework and recommendations for the international regulation of crypto assets and global stable coin agreements in October 2022. The FSB identified several problems related to the national application of crypto asset regulation and supervision, including existing regulatory authority and scope, gaps in application, risks associated with wallets and depository services, trading, lending, and borrowing, and the widespread use of distributed ledger technology (DLT). Both tokenized and non-tokenized DFAs face additional operational risk, liquidity, leverage ratio and large risks, supervision, and disclosure requirements. Special attention should be paid to the risks associated with certain issues, such as potential additional requirements for testing statistics and repayment risk for stablecoins, inclusion of blockchain assets without permission, assessment of stablecoins.

The main finding is that the current regulatory authority and its extent, as well as gaps in application, including cross-border cooperation, are important considerations. Risks associated with wallets and depository services, trading, lending and borrowing also need attention. Distributed ledger technology (DLT) is widely used. Both tokenized (Group 1) and non-tokenized DFAs (Group 2) are subject to additional operational risk, liquidity, leverage ratio and large risks, supervision and disclosure requirements. Specific attention should be given to certain issues, such as the potential additional requirements for testing statistics and repayment risk in relation to Group 1 assets (stablecoins), inclusion of blockchain assets without permission in Group 1, assessment of whether Group 1 crypto assets (stablecoins) can be used as collateral to meet capital requirements, and criteria and degree of hedge recognition for Group 2 assets.

The Basel Committee on Banking Supervision (BCBS) published its final rules for prudential regulation of risks associated with crypto assets in December 2022. Unsecured crypto assets and stable coins with inefficient stabilization mechanisms will be subject to conservative prudential regulation.

## **5. Discussion**

The focus of the work will be on addressing issues related to market integrity, investor protection, and financial stability in the context of managing crypto and DeFi risks within a regulatory framework. The Regulation of Crypto Asset Markets (MiCA) is set to be implemented in 2024, pending ratification by the European Parliament in early 2023. Its primary objective is to create a regulatory framework that facilitates the adoption of distributed ledger technology and crypto assets in the financial services sector while promoting innovation and addressing issues caused by the fragmentation of national structures.

MiCA aims to provide legal clarity, protect consumers and investors, ensure market integrity and financial stability, and solve issues related to national fragmentation. Any business activity related to crypto assets within the EU is likely to fall under MiCA’s ambit, and firms outside the EU that

deal with crypto assets for EU clients must comply with its requirements. Services regulated by MiCA are similar to those under MiFID regulation and require licensing for CASP. These include storage and administration of crypto assets, operation of a trading platform, exchange of crypto assets, execution of orders, placement of crypto assets, and provision of advice on crypto assets. The standard international requirements for the DFA operator include publishing technical information and reports online, providing a business plan, disclosing information about risks:

The technical document provides technical information about a crypto asset and is available online. It also includes a report on the organization's last three years and information about individuals or legal entities involved in the project. Additionally, it provides a brief description of the project, token characteristics, key utility characteristics, and information about "tokenomics". The document also contains a business plan that outlines the planned use of funds from the issue and information about the risks and reasons for applying for admission to trading platforms (if applicable). Restrictions on the possibility of transferring issued tokens are also disclosed. However, a technical document is not required if the crypto assets are offered for free, created using mining, unique and not interchangeable with other crypto assets, offered to less than 150 individuals or legal entities, the total amount of the issue does not exceed one million euros, or if the offer is addressed exclusively to qualified investors (Aharon and Demir, 2021; Akyildirim et al., 2020; Ante, 2022; Aslam et al., 2020; Bhuiyan et al., 2021; Borri et al., 2022).

MiCA has implemented an independent market abuse framework for crypto assets, which includes regulations to prevent market abuse via monitoring and enforcement mechanisms. This framework incorporates and extends existing concepts from EU financial services legislation and regulations, with a specific emphasis on preventing abuse in the EU market. Additionally, MiCA prohibits the manipulation of markets, the illegal disclosure of insider knowledge, and insider trading of crypto assets. For investors, the majority of risks are associated with fraudulent claims made during the promotion and sale of digital assets. In recent years, most enforcement actions have focused on misrepresentations regarding the nature of the asset, claims about investment profitability, and conflicts of interest that were not disclosed. However, regulators are now also looking into distortions of information about insurance coverage for assets held on the platform. International regulators are still in the early stages of evaluating other digital assets, including NFTs and DeFi. Since NFTs can be classified as works of art, they remain under the control of existing regulatory authorities (Akcora et al., 2018; Alexander and Imeraj, 2021; Almeida and Gonçalves, 2022, 2023; Angerer et al., 2020; Borri, 2019).

## **6. Conclusion**

The main result is that according to the final standard, banks are required to classify crypto assets on an ongoing basis into two groups. Group 1 includes: Crypto assets must fully comply with a set of classification conditions. Assets in this group include tokenized traditional assets and crypto assets with an effective stabilization mechanism that binds value to one or more traditional assets (stablecoins) (1b assets).

While the capital requirements for Group 1 assets Generally consistent with the existing Basel framework, the addition of infrastructure risks to risk-weighted assets (RWA) can be applied if weaknesses are identified in the underlying risk on which crypto assets are based. Group 1 excludes



algorithmic stable coins and assets that use protocols to maintain their value.

Group 2 includes: Crypto assets do not meet the classification conditions for Group 1 and are subject to a new conservative capital management. These assets include tokenized traditional assets and stablecoins that do not meet the conditions of the Group 1 classification, as well as all unsecured crypto assets.

Additional hedge recognition criteria establish conditions for those assets of Group 2 in which a limited degree of hedging can be recognized (2a) and where hedging is not recognized (2b).

The Financial Action Task Force (FATF) has recently released updated guidance for a risk-based approach to virtual assets and virtual asset providers. These guidelines require all jurisdictions to implement certain measures to combat money laundering, including transaction data sharing for transfers exceeding \$1000/euro worldwide. The travel rule is aimed at preventing the financing of terrorism, deterring payments to sanctioned individuals and organizations, enabling law enforcement agencies to request transaction details, supporting reporting of suspicious activity, and preventing money laundering.

However, as of July 2022, the FATF has reported that jurisdictions have made limited progress in implementing the travel rule, with the majority of them failing to enact legislation or initiate enforcement and supervisory measures. Moreover, the Committee on Payments and Market Infrastructure and the International Organization of Securities Commissions have published criteria for systemically significant infrastructure organizations of the DFA market in July 2022. This report provides recommendations on risk management and monetary settlements, focusing on market integrity, investor protection, financial stability, and the regulation of crypto and DeFi risks within the regulatory framework.

The European Commission's goal is to create a regulatory framework that will encourage the adoption of distributed ledger technology (DLT) and crypto assets in the financial services industry.

The work will focus on issues related to market integrity, investor protection and financial stability, as well as how to manage crypto and DeFi risks within the regulatory framework. The Regulation of Crypto Asset Markets (MiCA) is due to enter into force in 2024, subject to its ratification by the European Parliament (which is expected in early 2023), which is part of the European Commission's goal to create a regulatory framework to facilitate the introduction of distributed ledger technology (DLT) and crypto assets in the financial services sector.

The crypto space offers numerous opportunities for users to grow their risks for wealth through trading, lending, and borrowing activities. However, these opportunities come with inherent risks that need to be carefully managed to protect your assets and maximize returns. By understanding the risks associated with wallets and depository services, trading, lending, and borrowing, users can make informed decisions and enjoy the benefits of the rapidly evolving world of cryptocurrencies.

The results confirm that international regulators expect national authorities to implement a regulatory framework for digital assets comparable to those that already exist for traditional finance. For national authorities, this means having and using the powers, tools and resources to regulate and oversee a growing market. Authorities should cooperate and coordinate with each other, at the national and international levels, to encourage consistency and knowledge sharing. Market operators

(exchanges), service providers, exchanges and wallets, create effective risk management structures, as well as reliable mechanisms for collecting, storing, protecting and reporting data.

The open challenges in a similar domain for future researchers are NFT risk market data analysis based on regulatory frameworks of each country.

## Conflict of interest

The author declares no conflict of interest.

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