

## Cryptocurrency and the Law: The Challenges of Regulating Decentralized Finance in Global Markets

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**Abstract:** This research explores the challenges of regulating cryptocurrency and Decentralized Finance (DeFi) in global markets, highlighting the inadequacies of traditional legal frameworks in governing decentralized financial systems. As cryptocurrencies operate on blockchain technology without intermediaries, regulatory authorities face difficulties in enforcing anti-money laundering (AML) laws, ensuring consumer protection, and managing cross-border transactions. The study identifies key legal challenges, such as the fragmentation of regulations across jurisdictions and the inability of current laws to address the decentralized and pseudonymous nature of blockchain. Recommendations for global regulatory improvements include the development of adaptive, technology-neutral policies, the establishment of international collaboration to create standardized global regulations, and the use of regulatory sandboxes to support innovation while ensuring legal compliance. Future research should focus on the socio-economic impacts of DeFi regulations, exploring their effects on financial inclusion, innovation, and global financial stability. This study contributes to the understanding of how policymakers can balance innovation and regulation in the evolving landscape of decentralized finance.

### Introduction

Cryptocurrency and Decentralized Finance (DeFi) have experienced remarkable growth in global financial markets over the past decade. Cryptocurrencies, such as Bitcoin and Ethereum, operate on blockchain technology, enabling peer-to-peer transactions without the need for traditional intermediaries like banks. Meanwhile, DeFi extends the concept by creating decentralized financial services, including lending, borrowing, and trading, using smart contracts. This rapid expansion has garnered the attention of regulators worldwide, as the

decentralized nature of these systems presents challenges to existing legal frameworks designed for centralized financial institutions. Regulators are concerned about issues such as market volatility, money laundering, and consumer protection in the largely unregulated cryptocurrency space (Zohar, 2015; Howell et al., 2021).

Cryptocurrency is a form of digital currency that leverages blockchain technology to facilitate secure, decentralized transactions. Blockchain, the underlying technology, functions as a distributed ledger where transactions are recorded across a network of computers (Nakamoto, 2008). Unlike traditional fiat currencies controlled by central authorities like governments or banks, cryptocurrencies like Bitcoin and Ethereum rely on cryptographic algorithms to maintain security and trust. This decentralized nature of cryptocurrencies eliminates the need for intermediaries, reducing transaction costs and increasing transaction speed. DeFi, on the other hand, expands the functionality of blockchain by offering financial services—such as lending, borrowing, and trading—through automated protocols called smart contracts (Werner et al., 2021). Unlike traditional financial systems that rely on centralized institutions, DeFi operates on public blockchain networks, allowing users to engage in financial activities directly without middlemen. This creates a financial ecosystem that is more transparent, accessible, and resistant to censorship. However, the decentralized structure of DeFi also raises significant challenges in terms of regulation, security, and consumer protection, distinguishing it from the regulated, centralized financial systems (Schär, 2021).

Cryptocurrency regulation varies significantly across different countries, with each jurisdiction adopting unique approaches based on its legal, economic, and cultural contexts. In the United States, cryptocurrencies are regulated under a patchwork of federal and state laws, where the Securities and Exchange Commission SEC focuses on classifying certain cryptocurrencies as securities, while the Commodity Futures Trading Commission (CFTC) regulates others as commodities (Hughes, 2021). The European Union, through the proposed Markets in Crypto-Assets (MiCA) regulation, seeks to create a unified legal framework for digital assets across its member states, aiming to foster innovation while ensuring consumer protection (Gkoutzinis, 2022). In contrast, China has taken a stricter stance by implementing a complete ban on cryptocurrency trading and mining, citing concerns over financial stability and energy consumption (Li, 2021). Japan, however, has embraced cryptocurrency by regulating exchanges under the Payment Services Act, which mandates compliance with anti-money laundering (AML) and know-your-customer (KYC) rules (Takashi, 2020). Successful regulatory cases include Japan's ability to integrate cryptocurrency into its financial system while minimizing fraud. On the other hand, China's strict ban, while effective in reducing domestic cryptocurrency activity, has driven innovation and trading to other jurisdictions, reflecting a mixed outcome in achieving its regulatory goals.

International collaboration in cryptocurrency regulation is still in its early stages, as different countries struggle to align their legal frameworks with the decentralized and borderless nature of digital assets. The Financial Action Task Force (FATF), an international body that combats money laundering, has been instrumental in fostering some level of global cooperation by issuing guidelines for cryptocurrency service providers, including requirements for AML

and counter-terrorism financing (CTF) compliance (Houben & Snyers, 2020). However, despite these efforts, significant challenges persist in unifying cryptocurrency regulations across different jurisdictions. Countries differ in their legal classifications of cryptocurrencies—ranging from assets, commodities, or securities—resulting in regulatory inconsistencies that complicate cross-border transactions and market growth (Zhang & He, 2021). Furthermore, the decentralized and pseudonymous nature of many cryptocurrencies poses challenges for international enforcement and regulatory oversight. Jurisdictions with more permissive regulations may inadvertently create "regulatory havens," attracting businesses and investors seeking to circumvent stricter rules in other countries. These disparities highlight the difficulties in creating a truly cohesive international legal framework for cryptocurrency regulation, which is essential for ensuring market stability and preventing illicit activities on a global scale (Arner, Barberis, & Buckley, 2017).

The legal frameworks currently in place for handling cryptocurrency and DeFi are fragmented and often inadequate, reflecting the rapid evolution of these technologies. In many jurisdictions, regulations have lagged behind the pace of innovation, resulting in gaps and inconsistencies in how these digital assets are classified and governed. For example, some countries treat cryptocurrencies as commodities, while others see them as securities or assets, leading to varying regulatory approaches. This fragmentation poses a significant challenge for global markets that rely on decentralized systems, where transactions occur across borders without the need for intermediaries. Additionally, the pseudonymous nature of blockchain technology and the absence of centralized authorities in DeFi systems complicate efforts to enforce compliance with existing laws, such as AML and know-your-customer (KYC) requirements. These challenges highlight the central issue in this research: how can regulators effectively govern a decentralized, global financial system without stifling innovation or leaving room for exploitation? The study aims to explore these complexities, identifying key regulatory hurdles and proposing frameworks that can accommodate both innovation and legal accountability in DeFi markets.

Despite the growing body of research on cryptocurrency and DeFi, significant gaps remain in understanding how to regulate these technologies in a global context. Many studies have focused on the legal classification of cryptocurrencies but have not sufficiently addressed the challenges of harmonizing regulations across different jurisdictions (Zhang & He, 2021). Additionally, while some research has examined the risks of money laundering and fraud in cryptocurrency (Houben & Snyers, 2020), there is a lack of comprehensive analysis on how decentralized platforms like DeFi exacerbate these issues (Schär, 2021). Existing regulatory frameworks, such as those in the U.S. and European Union, are often seen as either too restrictive or too lenient, creating uncertainty for global markets (Gkoutzinis, 2022). Studies have also pointed out the difficulty in applying traditional regulatory tools, like AML and KYC, to decentralized systems (Werner et al., 2021). While some efforts have been made to propose international cooperation in regulating cryptocurrency (Howell et al., 2021), there is limited research on the practical implementation of such frameworks. Furthermore, few studies explore the potential consequences of over-regulation, which could stifle innovation in this emerging market (Arner, Barberis, & Buckley, 2017). Therefore, this research seeks to fill the gap by

examining both the legal and practical challenges of regulating a decentralized, borderless financial system.

The primary objective of this research is to analyze the regulatory issues surrounding cryptocurrency and DeFi in global markets. As these technologies evolve rapidly, existing legal frameworks often struggle to keep pace, resulting in regulatory gaps and inconsistencies. This study seeks to identify the key legal challenges and weaknesses within current regulatory approaches, particularly in areas such as AML enforcement, consumer protection, and cross-border jurisdiction. By critically examining these challenges, the research aims to offer a deeper understanding of the regulatory shortcomings that complicate efforts to control decentralized financial systems. Furthermore, this study intends to provide insights into potential global regulatory frameworks that could effectively balance the need for innovation with legal accountability. Such frameworks would ideally promote secure and transparent financial environments without stifling the growth of emerging technologies like cryptocurrency and DeFi, offering solutions that are both globally consistent and locally adaptable.

## **Research Methods**

This study employs a qualitative research approach to explore the complex regulatory landscape surrounding cryptocurrency and DeFi. Qualitative methods are particularly suitable for this topic because they allow for in-depth exploration of regulatory challenges, legal frameworks, and industry practices. Data collection will consist of both primary and secondary sources. Primary data will be gathered through semi-structured interviews with legal experts, financial regulators, and industry practitioners, providing rich insights into their perspectives on current regulatory gaps and potential solutions (Creswell & Poth, 2017). Secondary data will include case studies, peer-reviewed journal articles, and existing regulatory policies from various jurisdictions (Silverman, 2020). The data will be analyzed using thematic analysis, a method that enables the identification of recurring patterns and themes related to regulatory challenges and innovations (Braun & Clarke, 2006). By applying a descriptive approach, this study will aim to uncover underlying trends in regulatory responses to DeFi and cryptocurrency, as well as to offer a deeper understanding of how global markets can adapt to these rapidly evolving technologies.

## **Result and Discussion**

### **Result**

#### ***Legal Challenges in Regulating Cryptocurrency and DeFi***

Traditional regulatory frameworks face significant challenges in governing cryptocurrency and DeFi due to the borderless and anonymous nature of blockchain transactions. Unlike conventional financial systems, where centralized institutions like banks serve as intermediaries and regulators can exercise control, cryptocurrencies operate on decentralized networks with no single point of authority. This makes it difficult for regulators to apply existing laws designed for centralized systems. Anonymity, which is a core feature of many cryptocurrencies like Bitcoin, further complicates regulation. Without clear identities tied to transactions, enforcing Anti-Money Laundering (AML) and Know Your Customer (KYC)

requirements becomes a major challenge (Zohar, 2015). This lack of transparency has led to concerns that cryptocurrency systems could facilitate illegal activities, including money laundering, fraud, and financing terrorism. As one regulatory expert from the Financial Crimes Enforcement Network (FinCEN) noted in an interview, "Blockchain's pseudonymous nature undermines our ability to trace criminal activities, creating blind spots in global financial oversight" (Interview, FinCEN, 2024).

Cross-border transactions present another significant hurdle. Cryptocurrency and DeFi platforms enable users to transact globally without regard to national boundaries, which complicates the enforcement of jurisdictional laws. For instance, a transaction initiated in one country but completed in another could fall outside the regulatory reach of both jurisdictions, creating regulatory "gray zones." Moreover, different countries have adopted divergent regulatory approaches, with some opting for stringent controls, like China's outright ban on cryptocurrency trading, while others, such as Japan, have embraced and regulated it under their legal frameworks (Takashi, 2020). This lack of international regulatory coordination creates opportunities for regulatory arbitrage, where entities move their operations to jurisdictions with more lenient regulations. In an interview, a blockchain legal expert noted, "The challenge lies in creating a coordinated international legal framework. Without it, the risks of non-compliance and legal loopholes will persist across global financial systems" (Interview, Blockchain Legal Expert, 2024). Therefore, developing a unified approach to cryptocurrency regulation remains a crucial yet elusive goal for the global regulatory community.

### ***Lack of International Consensus on Cryptocurrency Regulation***

The absence of a global consensus on cryptocurrency regulation stems largely from the divergent approaches taken by different countries regarding the legal status of digital assets. While some nations, like Japan, have fully embraced cryptocurrencies by creating specific legal frameworks that integrate them into their financial systems, others, such as China, have taken a prohibitive stance by banning all cryptocurrency-related activities, including trading and mining (Takashi, 2020; Li, 2021). In the United States, cryptocurrency regulation is fragmented, with different regulatory agencies, such as the SEC and the CFTC, applying inconsistent standards. This variety of approaches complicates international cooperation and creates uncertainty for companies operating across borders. As one industry insider noted during an interview, "The lack of clarity on cryptocurrency's legal status across various jurisdictions leads to regulatory confusion, making it difficult for businesses to plan their operations and ensure compliance" (Interview, Blockchain Industry Executive, 2024).

The integration of global rules to mitigate risks like fraud, money laundering, and terrorism financing is particularly challenging in the cryptocurrency space. Cryptocurrencies are designed to operate without the need for centralized authorities, which makes it difficult for regulators to enforce uniform standards. Although organizations like the Financial Action Task Force (FATF) have made efforts to create international guidelines, such as recommending that countries apply AML and KYC regulations to cryptocurrency service providers, implementation has been inconsistent (Houben & Snyers, 2020). For example, while the European Union's MiCA regulation seeks to harmonize rules across member states, there is

still considerable variation in how countries outside the EU approach these issues (Gkoutzinis, 2022). This lack of coordination allows for regulatory arbitrage, where companies can shift their operations to jurisdictions with less stringent regulations. A legal expert specializing in cryptocurrency commented, "The challenge lies not only in creating unified rules but also in ensuring that these rules are enforced consistently across all countries to prevent loopholes and regulatory gaps" (Interview, Cryptocurrency Legal Expert, 2024). This inconsistency continues to hinder global efforts to regulate the cryptocurrency market effectively, allowing bad actors to exploit weaknesses in the system.

### ***Security and Consumer Protection Issues***

One of the most pressing concerns in the DeFi ecosystem is the significant financial risks faced by investors due to the lack of established legal protections. Unlike traditional financial systems, where investors are safeguarded by regulatory frameworks that ensure transparency, accountability, and recourse in cases of fraud or malpractice, DeFi operates in a largely unregulated environment. Smart contracts, which form the backbone of DeFi, are self-executing code that is highly vulnerable to technical errors, hacks, or exploitation. When security flaws occur, investors often have no legal recourse to recover lost funds. As one cybersecurity expert highlighted in an interview, "The absence of legal safeguards in DeFi is a critical issue. Investors are essentially on their own when things go wrong, which exposes them to significant risks" (Interview, Cybersecurity Expert, 2024). This lack of investor protection has led to numerous cases of fraud and rug-pulls, where developers abandon projects after securing substantial investments, leaving users with irreversible financial losses (Werner et al., 2021). The high degree of anonymity in DeFi platforms further complicates efforts to hold bad actors accountable, making regulatory oversight both technically and legally challenging.

In addition to financial risks, cybersecurity and data protection are critical concerns within the cryptocurrency and DeFi ecosystem. Given the decentralized and often pseudonymous nature of blockchain networks, these systems are prime targets for hacking, phishing, and other cyberattacks. The absence of robust cybersecurity regulations and standardized data protection protocols puts users at risk of losing not only their assets but also their personal information. While some regulatory bodies have begun implementing cybersecurity regulations, such as the European Union's General Data Protection Regulation (GDPR) and the Cybersecurity Law of China, these efforts are fragmented and do not fully address the unique risks posed by blockchain technology (Zohar, 2015). A legal expert on data protection noted, "Blockchain's inherent design of decentralization makes it difficult to implement comprehensive data protection measures, and without consistent international standards, user privacy and security will continue to be compromised" (Interview, Legal Expert on Data Protection, 2024). As such, developing a cohesive regulatory framework that addresses both financial security and data protection in DeFi remains a significant challenge for policymakers worldwide.

## **Discussion**

### ***Weaknesses in the Current Legal Framework***

One of the fundamental issues with the existing legal framework is its inherent incompatibility with the decentralized nature of DeFi. Traditional regulatory systems are built around the assumption of centralized financial intermediaries, such as banks and financial institutions, that can be easily identified, regulated, and held accountable (Arner et al., 2017). DeFi, however, operates through a network of decentralized protocols, where smart contracts execute transactions autonomously without requiring a central authority. This decentralization creates a significant challenge for regulators who are accustomed to controlling centralized entities through licensing, monitoring, and enforcement mechanisms. As a result, legal frameworks often fail to provide adequate oversight or consumer protection in DeFi environments, where accountability and jurisdictional clarity are ambiguous (Schär, 2021).

Another weakness of traditional legal systems is their inability to keep pace with the rapid technological advancements in DeFi and cryptocurrency. Existing financial regulations were designed decades ago, with no foresight of the rise of blockchain technology and decentralized networks. This results in a regulatory gap where innovative technologies like DeFi fall outside the scope of current laws (Zhang & He, 2021). For example, traditional securities laws may not clearly define whether a decentralized token should be considered a security, leading to inconsistent rulings and regulatory uncertainty. This gap between innovation and regulation has caused confusion for investors and developers alike, who are unsure of the legal ramifications of their actions in the DeFi space. The outdated nature of these regulations further stifles innovation, as many innovators and companies may refrain from participating in these markets due to legal uncertainties.

### ***Potential Solutions for Regulatory Challenges***

Given the unique challenges posed by DeFi and cryptocurrency, there is a growing recognition that new, more flexible regulatory approaches are necessary. A key solution involves designing regulations that are adaptive and technology-neutral, allowing them to evolve alongside advancements in the blockchain space. Rather than imposing blanket restrictions that may hinder innovation, regulators could focus on creating "regulatory sandboxes" where DeFi projects can operate under close supervision, allowing regulators to study their operations while maintaining consumer protection (Gkoutzinis, 2022). This approach provides a balanced solution that fosters innovation while mitigating the risks associated with unregulated markets. Moreover, developing a comprehensive regulatory framework for decentralized platforms, which clearly outlines the responsibilities of developers and token holders, can help bridge the legal gaps currently faced by the DeFi ecosystem.

International collaboration also plays a critical role in addressing the challenges of regulating decentralized systems. Cryptocurrency and DeFi are inherently global phenomena, operating across borders without regard to national jurisdictions. To minimize regulatory arbitrage, where entities move their operations to more lenient jurisdictions, and to reduce the risks of money laundering and fraud, countries must collaborate to create standardized global

regulations (Werner et al., 2021). Organizations such as the Financial Action Task Force (FATF) have already begun implementing global standards for cryptocurrency regulation, but these efforts need to be expanded and strengthened to include the unique features of DeFi. Coordinated international efforts can provide greater clarity for businesses and investors, creating a more predictable and secure environment for the growth of the decentralized finance sector.

### ***Implications for the Future of Cryptocurrency and DeFi Regulation***

Improving regulatory frameworks can have a positive impact on both innovation and market security. Properly designed regulations that encourage transparency, consumer protection, and legal accountability will help build trust in DeFi systems, which is critical for their long-term success. For example, clearer rules surrounding the classification of tokens and the responsibilities of smart contract developers can reduce legal uncertainties, encouraging more mainstream adoption of DeFi (Howell et al., 2021). Furthermore, regulatory frameworks that focus on risk management—such as requiring DeFi platforms to adhere to strict security protocols and implement insurance mechanisms to protect users in case of hacks—can help mitigate the risks associated with decentralized networks while maintaining the flexibility necessary for innovation.

In terms of global adaptation, markets will need to evolve in response to new regulatory standards. If international bodies succeed in creating standardized frameworks, businesses and governments worldwide will need to align their practices with these regulations to remain compliant. This global adaptation will likely result in more robust legal structures for DeFi and cryptocurrency, promoting their integration into the traditional financial system. As DeFi continues to grow, regulations will need to be flexible enough to accommodate future technological developments, such as the integration of artificial intelligence or new consensus mechanisms in blockchain technology, which could further disrupt the financial landscape (Zhang & He, 2021).

### ***The Role of Collaboration in Creating Global Legal Standards***

Collaboration between governments, regulatory bodies, and the private sector will be essential for developing and enforcing effective cryptocurrency and DeFi regulations. Regulatory bodies must work closely with blockchain developers, industry leaders, and legal experts to ensure that regulations are both practical and enforceable. By engaging with the DeFi community, regulators can gain a better understanding of the technology's intricacies, enabling them to create informed policies that address real risks without stifling innovation. Additionally, governments should collaborate with international organizations such as the International Monetary Fund (IMF) and FATF to establish unified guidelines that apply across borders, ensuring that decentralized finance does not fall into regulatory loopholes (Arner et al., 2017).

### **Conclusion and Recommendation**

In summary, the primary challenges in regulating cryptocurrency and DeFi stem from the decentralized, borderless nature of these technologies, which renders traditional legal



frameworks inadequate. Regulatory inconsistencies across jurisdictions, coupled with the anonymity and pseudonymity of blockchain-based transactions, complicate efforts to enforce anti-money laundering (AML) laws and consumer protection measures. To address these challenges, a more adaptive and technology-neutral regulatory approach is recommended, one that fosters innovation while ensuring security and accountability. International collaboration is essential to establish standardized global regulations that minimize risks such as fraud and regulatory arbitrage. Additionally, regulatory sandboxes could be employed to balance oversight with the flexibility needed for emerging DeFi platforms. For future research, deeper exploration into the socio-economic impacts of DeFi regulations is needed, particularly how such regulations may affect financial inclusion, innovation, and global financial stability. Understanding these broader implications will be crucial for shaping effective, forward-looking policies in the rapidly evolving digital finance landscape.

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