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Legal Examination of New Money Laundering Schemes Using Digital Assets and Decentralized Finance in Indonesia

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A B S T R A C T

The rapid growth of digital assets and decentralized finance (DeFi) has enabled anonymous, cross-border, and non-custodial money laundering schemes that challenge Indonesia's conventional anti-money laundering (AML) regime. This study critically examines the adequacy of Indonesia's AML regulations in addressing DeFi-based laundering and identifies the need for more adaptive legal policies. Using normative legal research with legislative, conceptual, and case-based approaches, the analysis draws on laws, regulations, and relevant literature. The findings show that while Indonesia has a foundational AML framework, it remains insufficient to address DeFi's decentralized characteristics and limited regulatory control. The study concludes that adaptive AML reforms are necessary to enhance enforcement effectiveness and safeguard the integrity and stability of the national financial system.

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INTRODUCTION

The development of digital financial technology in the past decade has driven significant transformation in the global financial system, particularly through the use of digital assets and the Decentralized Finance (DeFi) ecosystem. These innovations offer transaction efficiency, increased financial inclusion, and easy cross-border access without institutional intermediaries, which makes them attractive to global economic actors (Chen & Bellavitis, 2020). However, DeFi's decentralized, non-custodial, and smart contract-based characteristics simultaneously create new space for financial crimes, including money laundering. Empirical studies show that the increase in the adoption of crypto assets correlates with the increasing complexity and anonymity of money laundering schemes that are difficult for law enforcement authorities to track (Foley et al., 2022).

In Indonesia, this phenomenon is becoming increasingly relevant along with the increasing number of crypto asset users and the development of blockchain-based platforms in digital economy activities. The state already has the main legal framework in the prevention and eradication of money laundering through Law Number 8 of 2010 concerning the Prevention and Eradication of Money Laundering Crimes, which regulates the obligation to report suspicious financial transactions, the principle of identification of service users, and the role of the Financial Transaction Reporting and Analysis Center as a financial intelligence institution. However, the regulation is designed in the context of a centralized financial system that relies on intermediary institutions, so it has not explicitly anticipated a DeFi transaction model that is peer-to-peer and does not involve a single controlling entity. This condition poses a juridical challenge to the effectiveness of applying Anti-Money Laundering principles in the ever-evolving digital financial ecosystem (Yadav & Singh, 2021).

Indonesia's financial sector reform is further emphasized by the enactment of Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector, which normatively recognizes crypto assets as part of the national financial sector and strengthens the role of supervisory authorities. This law confirms the transfer of the regulatory and supervisory functions of crypto assets to the Financial Services Authority and emphasizes the importance of financial system stability and consumer protection. However, the regulation related to DeFi activities is still implicit and does not yet come with a comprehensive oversight framework for non-custodial transactions. The international financial law literature assesses that the absence of a central entity in DeFi creates a regulatory loophole that could potentially be exploited in blockchain technology-based money laundering practices (Zetzsche et al., 2020).

A number of previous studies have examined the relationship between digital assets and money laundering from an international perspective. Chen and Bellavitis (2020) assert that extreme decentralization in DeFi structurally makes it difficult to apply the principles of Know Your Customer and Customer Due Diligence. Other research revealed that the use of crypto-mixing services, privacy coins, and cross-chain transactions significantly increases the difficulty of tracing illegal fund flows by supervisory authorities (Möser et al., 2021). Nevertheless, most of the studies focused on the jurisdiction of the United States and the European Union, thus reflecting less on the normative challenges faced by developing countries with different legal systems. As a result, the readiness of the Indonesian legal system in responding to the phenomenon of DeFi-based money laundering is still relatively minimal and studied in depth.

The research gap of this research lies in the limitations of normative legal studies that systematically integrate Indonesia's national regulations with the unique characteristics of DeFi as a decentralized financial system. Existing studies tend to discuss crypto assets in the context of futures trading, financial technology innovation, or consumer protection, without analyzing their implications for the effectiveness of national anti-money laundering regimes. In addition, there have not been many studies evaluating the suitability between Indonesia's positive legal norms and blockchain-based money laundering practices that are developing globally (Arner et al., 2022). This gap demonstrates the need for nationally context-oriented research with an adaptive legal approach.

Based on this background, this study aims to critically examine the adequacy and effectiveness of Indonesia's legal framework in dealing with new money laundering schemes that utilize digital assets and decentralized finance. This study explicitly analyzes the compatibility between the Law on the Prevention and Eradication of Money Laundering as well as the latest financial sector regulations with the characteristics of decentralized and anonymous DeFi transactions. In addition, this study aims to identify normative and institutional challenges in anti-money laundering law enforcement in the era of digital financial transformation. The focus of the research is directed at positive legal evaluation and the formulation of the need to strengthen legal policies that are adaptive to technological innovation.

The contribution of this research is theoretically expected to enrich the study of financial law and economic criminal law with a new perspective on the relationship between technological decentralization and regulatory effectiveness. Practically, the results of this study are expected to be a reference for policymakers and supervisory authorities in designing anti-money laundering regulations that are more responsive to DeFi innovations. This research also provides an argumentative basis for strengthening coordination between institutions in the supervision of digital financial transactions. Thus, this research contributes to efforts to maintain the integrity and stability of the national financial system in the midst of the dynamics of global digital transformation.

THEORETICAL REVIEW

Digital Assets and the Evolution of Money Laundering Practices

The development of digital assets has fundamentally changed the patterns of financial crimes, particularly money laundering practices that now utilize blockchain technology to disguise the origins of illegal funds. Research by Fanusie & Robinson (2020) shows that the pseudonymous nature of crypto transactions allows criminals to move value across borders with minimal scrutiny. Another study confirms that the increasing volume of digital asset transactions is directly proportional to the complexity of layering techniques in digital money laundering (Campbell-Verduyn, 2021). This literature confirms that digital assets are not only an investment instrument, but also a new means in financial crime that challenges conventional legal frameworks.

Decentralized Finance (DeFi) and Regulatory Challenges

Decentralized Finance is understood as a smart contract-based financial ecosystem that operates without a central authority, so it is structurally different from the traditional financial system. Research conducted by Schär (2021) explains that the absence of intermediaries in DeFi leads to the loss of regulatory control points that have been the basis for the implementation of Anti-Money Laundering policies. In addition, the use of automated liquidity pools and decentralized exchanges magnifies the risk of misuse of the system for illegal transactions (Werner et al., 2021). This literature emphasizes that DeFi creates new legal challenges because it operates beyond the boundaries of traditional jurisdictions.

Anti-Money Laundering Frameworks in the Digital Era

The Anti-Money Laundering framework globally is under significant pressure due to digital financial technology innovations. Research by Ferwerda et al., (2020) revealed that a financial institution-based approach is no longer adequate when transactions are carried out through decentralized protocols. Another study emphasizes the need for a paradigm shift from entity-based regulation to activity-based regulation in the face of digital financial crime (Teichmann & Falker, 2022). This literature shows that the Anti-Money Laundering regime must adapt conceptually and technically to remain effective in the digital finance era.

International Standards on Virtual Assets and DeFi

International standards play a crucial role in shaping countries' responses to digital asset-based money laundering risks. The Financial Action Task Force, through its recommendation update, emphasizes that virtual assets and virtual asset service providers must comply with the principles of Anti-Money Laundering and Counter-Terrorism Financing which are equivalent to traditional financial institutions (Financial Action Task Force, 2021). Academic research assesses that although international standards have evolved, their application to DeFi still faces conceptual obstacles due to the absence of service providers who can be held legally accountable (Bains et al., 2022). This literature underscores the tension between the principle of decentralization and the demands of global legal compliance.

Indonesian Legal Framework and Research Gap

In the Indonesian context, the legal framework for Anti-Money Laundering rests on Law Number 8 of 2010 concerning the Prevention and Eradication of Money Laundering Crimes, which emphasizes the obligation to report and identify service users by financial service providers. In addition, Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector expands the scope of supervision of the financial sector, including crypto assets. However, research by Pratama & Nugroho (2023) shows that national regulations are still focused on centralized entities and have not accommodated the characteristics of non-custodial DeFi transactions. This literature confirms the gap between the development of digital financial practices and the readiness of Indonesia's national regulations.

METHODOLOGY

Types and Approaches to Research

This research is a normative legal research with a qualitative-doctrinal approach, which focuses on the analysis of positive legal norms and juridical constructions in responding to the phenomenon of digital asset-based money laundering and Decentralized Finance (DeFi). The research design uses legal analytical research, which aims to assess the suitability, adequacy, and effectiveness of Indonesia's anti-money laundering legal framework on the characteristics of decentralized financial transactions. The approaches used include a statutory approach, a conceptual approach, and a limited comparative approach to compare national standards with international regulatory practices related to virtual assets and DeFi (McConville & Chui, 2020; Hutchinson & Duncan, 2022).

Population and Selection Techniques for Legal Materials

The population in this legal research is in the form of all legal materials relevant to the Anti-Money Laundering regime and the regulation of digital assets and DeFi. The technique of selecting legal materials is carried out in a non-probability manner by purposive legal sampling, based on its normative relevance and binding strength. Primary legal materials include Law Number 8 of 2010 concerning the Prevention and Eradication of Money Laundering Crimes, Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector, as well as derivative regulations of the Financial Services Authority and the Financial Transaction Reporting and Analysis Center related to crypto assets. Secondary legal materials include articles from reputable international journals, global policy reports, and official documents of international institutions published in the period 2020–2024, selected to ensure empirical and conceptual relevance (Siems & Mac Síthigh, 2022).

Data Collection Techniques

Data collection was carried out through systematic and structured literature studies. This technique includes searching international scientific databases such as Scopus, Web of Science, and Google Scholar, as well as official sources of international institutions and financial regulators. The research instrument is a legal material classification guide, which is used to group norms, legal principles, and policies related to Anti-Money Laundering, digital assets, and DeFi. The validity of the data is maintained through triangulation of legal sources, namely by comparing national norms, academic doctrines, and international standards, in order to minimize interpretive bias and improve the consistency of analysis (Booth et al., 2021).

Research Procedure

The research was carried out through several successive stages. The first stage is the identification of legal issues, namely mapping the characteristics of DeFi-based money laundering schemes that pose juridical challenges. The second stage includes the inventory and systematization of legal materials, both primary and secondary, in accordance with the focus of the research. The third stage is a normative-critical analysis, by assessing the suitability between Indonesia's positive legal norms and decentralized digital finance practices. The final stage is in the form of the formulation of legal arguments and policy recommendations, which are directed at strengthening Anti-Money Laundering regulations that are adaptive to financial technology innovations (Hoecke, 2021).

Data Analysis Techniques

Data analysis was carried out using normative-qualitative analysis through systematic, telelogical, and futuristic legal interpretation methods. This analysis aims to uncover the strengths and weaknesses of legal norms in reaching anonymous and non-custodial DeFi transactions. To support the consistency of the analysis, this study utilizes legal mapping and conceptual framework analysis. This approach allows for the drawing of conclusions that are logical, coherent, and based on legal arguments that can be accounted for academically (Zamboni, 2020; Berman, 2023).

RESEARCH RESULTS

Juridical Characteristics of Digital Asset-Based Money Laundering Schemes and Decentralized Finance

The results of the normative analysis show that digital asset-based money laundering schemes and decentralized finance represent a fundamental shift in the structure and mechanisms of modern financial crimes. This shift cannot be fully understood through the conventional money laundering conceptual framework built on the assumption of formal financial institutions as transaction intermediaries. In a Decentralized Finance system, transactions are carried out through smart contracts that run automatically on a blockchain network, without the involvement of intermediaries, asset custodians, or centralized managers. The absence of the intermediary causes the non-formation of traditional legal relationships between financial service providers and service users as assumed in the anti-money laundering regime.

Substantively, this study found that the stages of money laundering known in the doctrine of economic criminal law, namely placement, layering, and integration still occur in the digital asset ecosystem, but undergo significant mechanism transformation. The placement stage is no longer carried out through the deposit of funds to financial institutions, but through the direct conversion of the proceeds of criminal acts into crypto assets. The layering stage takes place through cross-exchange of Decentralized Finance protocols, the use of liquidity pools, as well as recurring transactions that are executed automatically by smart contracts. The integration stage is carried out by redirecting digital assets into the legal economic system, either through centralized platforms that have access to the national financial system or through the use of digital assets as a means of payment.

The characteristics of relative anonymity, the nature of cross-jurisdictional transactions, and full control of assets by users through private keys make Decentralized Finance a medium for money laundering that is structurally difficult to reach by institution-based surveillance systems. These findings confirm that Decentralized Finance-based money laundering is not just a variation of modus operandi, but rather reflects a change in the financial crime architecture that demands a fundamental adjustment of the legal approach.

Scope Limit of Law Number 8 of 2010 on Decentralized Financial Transactions

Through a legislative approach, this study analyzes Law Number 8 of 2010 concerning the Prevention and Eradication of Money Laundering as the main instrument of the anti-money laundering regime in Indonesia. Article 18 paragraph (1) of the law requires financial service providers to apply the principle of recognizing service users, which includes identification, verification, and transaction monitoring activities. Normatively, this provision assumes the existence of a legal subject who provides financial services and has control over the transactions of other parties. Article 23 paragraph (1) further regulates the obligation of financial service providers to submit suspicious financial transaction reports as a mechanism for early detection of money laundering crimes.

However, the results of systematic interpretation show that the effectiveness of these norms is entirely dependent on the existence of financial services providers as centralized entities. In a decentralized financial ecosystem that is non-custodial and peer-to-peer, there is no party that receives, controls, or manages funds belonging to other parties. Thus, no legal subject can normatively be burdened with the obligation to apply the principle of recognizing service users or the obligation to report suspicious financial transactions as referred to in Law Number 8 of 2010.

Furthermore, the authority of the financial transaction reporting and analysis center as stipulated in Articles 39 to 44 of Law Number 8 of 2010 functionally depends on the information submitted by the reporting party. In the context of Decentralized Finance, the absence of a reporting party creates structural limitations in the implementation of financial intelligence functions, especially at the stage of initial detection and tracing of fund flows. Therefore, this study confirms that although Law Number 8 of 2010 remains relevant in the centralized financial system, its reach becomes limited when faced with fully decentralized and code-based financial transactions.

Position of Law Number 4 of 2023 in the Regulation of Digital Assets

Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector is analyzed as a form of adaptation of national law to digital financial transformation. This law strengthens the state's role in maintaining financial system stability and provides legal legitimacy for the supervision of technology-based financial activities, including crypto assets, through strengthening the authority of the Financial Services Authority as a supervisory institution for the financial services sector.

However, through systematic and conceptual interpretation, this study found that the regulatory design in Law Number 4 of 2023 is still oriented towards financial services business actors who have a clear institutional structure, legal entity form, and legal standing. The mechanism for licensing, supervising, and enforcing sanctions is designed for legal subjects that can be identified, registered, and administratively supervised. Decentralized Financial Activities carried out through an open protocol without a single controlling entity have not obtained explicit regulation within the framework of the law.

As a result, although Law Number 4 of 2023 expands the scope of the financial sector and strengthens supervision of digital assets, this regulation has not been fully able to reach decentralized financial transactions that are non-custodial and algorithm-based. This normative vacuum shows that the strengthening of the national financial sector still faces limitations when dealing with financial innovations that operate outside of conventional institutional structures.

Normative Gap between Anti-Money Laundering Principles and Decentralized Finance Architecture

The results of the normative-critical analysis show that there is a fundamental gap between the anti-money laundering principles and the technical architecture of Decentralized finance. The principle of conceptually recognizing service users requires a legal relationship between service providers and service users, while decentralized finance allows transactions to take place without such legal relationships. The principle of reporting suspicious financial transactions requires the presence of a responsible legal subject, while decentralized finance operates through smart contracts that have no legal personality.

In addition, the mechanism for freezing and confiscating assets resulting from criminal acts faces serious obstacles because digital assets in non-custodial systems are completely under the control of private key holders. Without the involvement of a third party that controls the assets, the state has no effective legal instrument to intervene directly. This condition confirms that the entity-based regulatory approach currently used is not yet fully compatible with financial systems that operate on algorithmic activities.

Institutional Limitations in Law Enforcement on Decentralized Finance

This study found that the challenges of Anti-Money Laundering law enforcement against Decentralized Finance are also institutional. The design of the authority of the financial transaction reporting and analysis center and law enforcement officials is built on the assumption that there is a reporting institution as the main source of transaction data. In a decentralized financial ecosystem, the absence of reporting obligations causes the state to lose an initial entry point in the process of detecting, analyzing, and prosecuting money laundering crimes. In addition, the cross-border nature of Decentralized Finance transactions complicates the application of national jurisdiction and increases dependence on international cooperation. Thus, the limitations of law enforcement are not only due to the vacuum of legal norms, but also to institutional designs that have not been fully adapted to the realities of the decentralized financial system.

DISCUSSION

The results show that the use of digital assets and decentralized finance represents a structural transformation in money laundering practices that go beyond the conventional financial crime paradigm. These findings are in line with the view that blockchain technology and smart contracts have shifted the function of traditional financial intermediaries into algorithmic mechanisms that operate automatically and without centralized control (Zetzsche et al., 2020). In this context, money laundering no longer relies on the weaknesses of the supervision of formal financial institutions, but rather on the design of systems that inherently minimize institutional involvement.

The transformations of the placement, layering, and integration stages found in this study reinforce previous findings that crypto assets and Decentralized Finance protocols allow for the fragmentation of transactions quickly, across jurisdictions, and is difficult to trace in real time (Ferreira & Vale, 2021). Thus, the main significance of these findings is that Decentralized Finance based money laundering not only adds to the variety of modus operandi, but creates a new criminal space that operates beyond the basic assumptions of institution-based Anti-Money Laundering regimes.

Analysis of Law Number 8 of 2010 confirms that the effectiveness of Indonesia's Anti-Money Laundering regime is highly dependent on the existence of Financial Service Providers as the main legal subject. These findings are consistent with the argument that modern Anti-Money Laundering laws were historically developed for centralized financial systems that allow for the administrative application of identification, verification, and reporting obligations (Arner et al., 2020). When a transaction takes place in a non-custodial system, those basic assumptions are no longer met.

The limited authority of the reporting center and the analysis of financial transactions that depend on the reports of the reporting party shows the existence of a "regulatory blind spot" in the early detection stage of money laundering based on Decentralized Finance. This condition reinforces the global finding that national financial intelligence frameworks tend to be reactive and less effective when they do not have access to primary transaction data (Levi et al., 2022). Conceptually, this signals the need for a shift from an entity-based regulation approach to activity-based regulation.

Law Number 4 of 2023 shows the state's commitment to strengthening supervision of the digital financial sector, but the results of the study confirm that the regulatory orientation still rests on legal entity financial services business actors. These findings are in line with criticism that many countries are adopting an "institutional mimicry" approach, which is expanding supervisory authority without adjusting regulatory design to the technological character of a non-controlling entity (Buckley et al., 2021).

A consequence of these findings is the emergence of a normative gap between the positive law and the operational reality of Decentralized Finance. National regulations become effective only at the entry and exit points of the system, but lose reach within the open protocol ecosystem. Thus, the theoretical contribution of this study lies in the affirmation that strengthening the financial sector is not synonymous with the effectiveness of technology-based money laundering risk control.

The gap between Anti-Money Laundering principles and the Decentralized Finance architecture reflects the conflict between law subject-oriented law and technology operating through code. These findings support the view that "code as law" has shifted the locus of legal responsibility from humans to technical systems, thus complicating the attribution of criminal and administrative liability (De Filippi & Wright, 2020). In addition, full user control over private keys weakens the effectiveness of the asset freezing and confiscation mechanism, which has been the main instrument for the recovery of assets resulting from crime. This condition shows that the challenge of law enforcement is not just a vacuum of norms, but a mismatch between legal instruments and the design of financial technology.

The limitation of this research lies in its normative nature so that it has not studied the technical effectiveness of blockchain analytics tools empirically. However, this study provides concrete recommendations in the form of the need to develop an activity-based regulatory framework, strengthen international cooperation, and integrate technological approaches in national Anti-Money Laundering policies. Further research is suggested to combine legal analysis with empirical studies on the effectiveness of blockchain analytics-based transaction monitoring.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that money laundering schemes that utilize digital assets and decentralized finance in Indonesia represent a structural change in financial crime that is not fully accessible by conventional anti-money laundering legal frameworks. The results of the analysis show that the non-custodial character, relative anonymity, and absence of intermediary institutions in the decentralized finance ecosystem have limited the effectiveness of the implementation of the obligation to recognize service users, report suspicious financial transactions, and trace mechanisms for fund flows as stipulated in Law Number 8 of 2010. Meanwhile, Law Number 4 of 2023 has strengthened the supervision of the financial sector and digital assets, but it is still oriented to the subject of institutional law so that it is not fully adaptive to financial activities based on open protocols.

ADVANCED RESEARCH

This study emphasizes that strengthening the anti-money laundering regime in Indonesia requires adjusting the legal approach from entity-based to activity- and risk-based, accompanied by strengthening institutional capacity and cross-jurisdictional cooperation, in order to ensure the effectiveness of law enforcement and maintain the integrity of the national financial system in the midst of digital financial developments.

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