KOŠICKÁ BEZPEČNOSTNÁ REVUE

KOSICE SECURITY REVUE

Vol. 16, No. 1 (2026), p. 133 – 149

ISSN 1338-4880 (print ver.), ISSN 1338-6956 (online ver.)



Bridging Indonesia's Cryptocurrency Regulatory Divide Through Functional Integration

Prekonanie regulačného rozdelenia kryptografických aktív v Indonézii prostredníctvom funkčnej integrácie

Made WARKA[1], Merline Eva LYANTHI[2]

[1,2] *Universitas 17 Agustus 1945*

The manuscript was received on 15.06.2026 and was accepted after revision for publication on 27.06.2026

Abstract:

Indonesia's cryptocurrency asset regulation exhibits institutional fragmentation through concurrent jurisdiction of BAPPEBTI (Ministry of Trade) and OJK (Financial Services Authority), creating regulatory inconsistencies and inadequate investor protections. This study identifies sources of this disharmony and proposes comprehensive regulatory reform. Using juridical-normative research, statutory interpretation, and doctrinal analysis within Radbruch's legal certainty framework, the study examines Indonesian laws and compares regulatory approaches from the United States, Singapore, and EU's Markets in Crypto-Assets Regulation (MiCA). Analysis reveals four sources of regulatory disharmony: temporal institutional misalignment between pre-cryptocurrency frameworks and contemporary digital assets; doctrinal imprecision in foundational legal definitions; institutional incentive misalignment between BAPPEBTI's market development and OJK's investor protection mandates; and jurisdictional uncertainty from Law Number 4 of 2023's transitional provisions. These produce regulatory arbitrage, investor vulnerability, capital flight, and unmonitored systemic risks. Comparative analysis demonstrates that functional classification frameworks and risk-based approaches used in Singapore and EU provide viable solutions. The study advances novel theoretical framework applying Radbruch's principles to cryptocurrency regulation, identifies four discrete fragmentation sources, and develops functional asset classification adaptable to Indonesia's context. Findings provide evidence-based recommendations for amending Law Number 4 of 2023 with explicit statutory definitions, unified licensing frameworks, and harmonized investor protection standards essential for legal certainty and financial stability in Indonesia's digital finance ecosystem.

Keywords: *Cryptocurrency assets regulation, institutional fragmentation, functional regulation, investor protection, financial stability, blockchain technology*

This work is licensed under a Creative Commons Attribution 4.0 International License.

Abstrakt:

Regulácia kryptografických aktív v Indonézii vykazuje inštitucionálnu fragmentáciu prostredníctvom súbežnej jurisdikcie BAPPEBTI (Ministerstvo obchodu) a OJK (Úrad finančných služieb), čo spôsobuje regulačné nekonzistentnosti a nedostatočnú ochranu investorov. Táto štúdia identifikuje zdroje tejto neharmoničnosti a navrhuje komplexnú regulačnú reformu. Pomocou juridicko-normatívneho výskumu, výkladu zákonov a doktrinálnej analýzy v rámci Radbruchovho rámca právnej istoty štúdia skúma indonézske zákony a porovnáva regulačné prístupy z Spojených štátov, Singapuru a smernice EÚ o kryptografických aktívach (MiCA). Analýza odhalila štyri zdroje regulačnej neharmoničnosti: časovú inštitucionálnu nezhodu medzi predkryptografickými rámcami a súčasnými digitálnymi aktívami; doktrinálnu nepresnosť v základných právnych definíciách; inštitucionálnu nezhodu motivácií medzi rozvojom trhu BAPPEBTI a mandátmi ochrany investorov OJK; a jurisdikčnú neistotu z prechodných ustanovení zákona č. 4 z roku 2023. Tieto faktory vytvárajú regulačný arbitráž, zraniteľnosť investorov, odliv kapitálu a nesledované systémové riziká. Komparatívna analýza dokazuje, že funkčné klasifikačné rámce a prístupy založené na riziku používané v Singapure a EÚ poskytujú životaschopné riešenia. Štúdia je príspevkom k novému teoretickému rámcu aplikujúcemu Radbruchove princípy na reguláciu kryptografických aktív, identifikuje štyri samostatné zdroje fragmentácie a vyvíja funkčnú klasifikáciu aktív prispôsobenú indonézskemu kontextu. Zistenia poskytujú podložené odporúčania na zmenu zákona č. 4 z roku 2023 s explicitnými zákonným definíciami, jednotným rámcom licencií a harmonizovanými štandardmi ochrany investorov nevyhnutnými pre právnu istotu a finančnú stabilitu v ekosystéme digitálnych financií Indonézie.

Kľúčové slová: *regulácia kryptografických aktív, inštitucionálna fragmentácia, funkčná regulácia, ochrana investorov, finančná stabilita, technológia blockchain*

1. Introduction

The accelerated digital transformation of global financial systems has fundamentally altered the structure of economic transactions, investment mechanisms, and financial governance (Yeung, 2018). One of the most significant developments in the digital economy era is the emergence of cryptocurrency assets defined as cryptographically secured digital representations of value or rights which possess substantial economic value and enable cross-border transactional capabilities through decentralized ledger technologies. The technological innovation of blockchain has enabled rapid proliferation of decentralized digital assets such as Bitcoin and Ethereum, as well as various token-based financial products that are increasingly utilized not merely as speculative commodities but as sophisticated investment instruments integrated into modern financial ecosystems [1], [2]. These technological developments have created novel challenges for traditional legal frameworks designed for centralized financial intermediaries and pose fundamental questions about regulatory paradigms, institutional design, and the adequacy of existing legal institutions in addressing the operational and systemic characteristics of decentralized financial networks.

In Indonesia, the exponential growth of cryptocurrency transactions during the past decade reflects increasingly significant market penetration and acceptance of digital assets as constituent elements of the investment landscape. The Ministry of Trade, through the Commodity Futures Trading Supervisory Agency (Badan Pengawas Perdagangan Berjangka Komoditi—BAPPEBTI), officially recognized cryptocurrency assets as tradable commodities pursuant to the Ministry of Trade Regulation Number 99 of 2018 concerning General Policy on the Implementation of

Commodity Futures Trading on Cryptocurrency Assets. This regulatory recognition represented a pragmatic institutional response to market developments and aimed to extend supervisory authority to emerging digital asset markets. Subsequent regulatory instruments were promulgated to establish a comprehensive framework governing cryptocurrency exchanges, clearing institutions, custodian arrangements, and market participants.[3]. However, the regulatory architecture established within the commodity futures trading regime has proven increasingly inadequate in addressing the multifaceted characteristics of cryptocurrency assets as they function in contemporary digital financial markets.

Notwithstanding their legal classification as commodities within the futures trading regulatory regime, cryptocurrency assets demonstrate functional characteristics increasingly analogous to securities and investment products conventionally regulated under securities market law. Cryptocurrency assets are frequently acquired for long-term investment accumulation, portfolio diversification, speculative capital appreciation, and digital wealth accumulation functions characteristic of conventional investment instruments such as equities, debt obligations, and mutual funds. Retail and institutional investors alike increasingly treat cryptocurrency holdings as portfolio components, applying investment analysis frameworks, diversification strategies, and risk management techniques derived from modern portfolio theory and traditional securities market practice. This functional convergence engenders substantial legal ambiguity regarding the appropriate regulatory framework applicable to cryptocurrency assets in Indonesia and raises fundamental questions about regulatory jurisdiction, investor protection standards, institutional allocation of supervisory authority, disclosure requirements, and market conduct rules [1], [4]. The inadequacy of the current regulatory classification has become increasingly evident as blockchain-based financial instruments have evolved to encompass not only peer-to-peer value transfers but also complex instruments including decentralized finance (DeFi) protocols, non-fungible tokens (NFTs), and governance mechanisms that resist conventional legal categorization.

The legal complexity intensifies upon examination of institutional fragmentation between the commodity futures trading regulatory regime and the securities market oversight apparatus. BAPPEBTI exercises supervisory authority over cryptocurrency asset transactions classified as commodities under the Ministry of Trade, whereas the Financial Services Authority (Otoritas Jasa Keuangan OJK), established pursuant to Law Number 21 of 2011 on the Financial Services Authority, exercises regulatory and supervisory authority over securities and investment activities. This institutional dualism produces substantive regulatory inconsistencies, conflicting legal interpretations, and substantive uncertainty concerning applicable investor protection standards, disclosure requirements, and systemic risk management protocols [5]. The fragmentation of supervisory authority creates gaps in regulatory oversight, prevents coordinated policy responses to emerging risks, and generates confusion among market participants regarding applicable legal obligations. Furthermore, the absence of harmonized institutional arrangements undermines regulatory effectiveness and diminishes the capacity of regulatory authorities to implement consistent investor protection standards across different segments of the digital asset market.

The urgency of this governance challenge intensified following enactment of Law Number 4 of 2023 concerning Financial Sector Development and Strengthening

(Undang-Undang Pengembangan dan Penguatan Sektor Keuangan UU P2SK), which effected a jurisdictional transfer of cryptocurrency asset regulation and supervision from BAPPEBTI to the OJK and Bank Indonesia during a specified transitional period. Although this institutional reallocation aims to achieve integrated financial governance and consolidate financial regulation within a unified supervisory framework, the foundational legal characterization of cryptocurrency assets remains ambiguous. The legislation does not establish clear definitional criteria for distinguishing cryptocurrency assets from other categories of digital financial instruments, nor does it provide comprehensive guidance regarding application of securities market law principles to blockchain-based instruments. Consequently, the absence of harmonized regulatory frameworks threatens to diminish legal certainty, compromise regulatory efficacy, and undermine financial stability within Indonesia's emerging digital finance ecosystem. This transitional period presents both an opportunity and urgent demand for institutional and doctrinal clarity regarding the proper legal characterization, supervisory approach, and protective standards applicable to cryptocurrency assets.

This investigation addresses this regulatory lacuna by conducting comprehensive analysis of the disharmony in cryptocurrency asset regulation between the commodity futures trading regime and securities market law in Indonesia, with particular attention to the legal implications of blockchain technology and digital asset characteristics. The research objectives are to elucidate the institutional and doctrinal sources of regulatory fragmentation and identify specific provisions of existing law that generate conflicting interpretations; to examine comparative regulatory approaches from jurisdictions particularly the United States, Singapore, and the European Union that have developed more integrated and technologically informed frameworks for digital asset governance; to advance a functionally informed, risk-based legal framework capable of accommodating the technological and economic characteristics of cryptocurrency assets while maintaining robust investor protection and financial stability; and to contribute to legal scholarship on the intersection of digital technologies, financial regulation, and institutional design in contexts characterized by rapid technological innovation. By synthesizing legal doctrine with technological analysis, this study offers evidence-based recommendations for comprehensive legal reform aligned with both international best practices and Indonesia's constitutional framework, development objectives, and institutional capacities.

2. Methods

This investigation employs the juridical-normative research method, which prioritizes legal norms, doctrinal principles, and formal legal institutions as primary objects of analysis [6]. The juridical-normative approach is appropriate for this investigation because the research problem fundamentally concerns analysis of legal instruments, regulatory institutions, and doctrinal interpretations that constitute the formal legal framework governing cryptocurrency assets in Indonesia. The selection of this methodological approach is justified by the nature of the research question, which requires rigorous examination of statutory interpretation, institutional competencies, doctrinal coherence, and the adequacy of existing legal frameworks. This methodological choice does not preclude engagement with technological or empirical dimensions; rather, it emphasizes that the primary analytical focus concerns the

coherence, consistency, and adequacy of legal norms themselves as they address the challenges posed by decentralized digital technologies and blockchain-based financial instruments (Merton, 1968). Indeed, by grounding analysis in formal legal doctrine, this approach permits systematic evaluation of how legal institutions and interpretive frameworks respond to technological innovation.

The research systematically examines formal legal instruments applicable to cryptocurrency assets through statutory interpretation and legislative analysis. This analytical dimension involves close textual examination of the Commodity Futures Trading Law (Law Number 10 of 2011 Amending Law Number 32 of 1997 on Commodity Futures Trading, 2011); securities market legislation (Law Number 8 of 1995 on Capital Markets. State Gazette of the Republic of Indonesia Year 1995 Number 64, 1995); financial services regulatory instruments (Law Number 21 of 2011 on Financial Services Authority. State Gazette of the Republic of Indonesia Year 2011 Number 111, 2011); digital financial governance regulations issued by BAPPEBTI, OJK, and Bank Indonesia; anti-money laundering and counter-terrorism financing frameworks (Law Number 8 of 2010); and regulations addressing digital asset custodial arrangements and market infrastructure [7], [8], [9]. Textual analysis examines legislative intent through examination of legislative history, identifies regulatory definitions and their scope, traces jurisdictional allocations among regulatory agencies, and evaluates the doctrinal coherence of regulatory provisions. This analytical approach recognizes that statutory interpretation constitutes not merely a technical exercise but rather a fundamental method through which law adapts to novel circumstances and emerging technologies [10].

A complementary doctrinal-conceptual analytical dimension examines foundational legal concepts underlying financial regulation and their application to emerging digital asset markets. This analysis addresses several interrelated conceptual frameworks: legal certainty and its relationship to regulatory predictability and investor confidence; legal harmonization as a methodological response to regulatory fragmentation and institutional dualism; investor protection as a regulatory objective and its doctrinal foundations within securities law jurisprudence; the analytical distinction between investment instruments and commodity derivatives within both statutory frameworks and judicial interpretation; and the emerging concepts of functional regulation and risk-based regulatory design as they apply to emerging financial innovations and technological disruption. This analytical layer situates cryptocurrency asset regulation within broader legal-theoretical frameworks applicable to financial governance and institutional design, thereby enabling identification of generalizable principles that may inform regulatory reform. The doctrinal analysis recognizes that addressing regulatory fragmentation requires not merely institutional reorganization but also doctrinal reconstruction that clarifies foundational legal concepts and their application to novel financial instruments.

A structured comparative institutional and regulatory analysis examines regulatory frameworks governing cryptocurrency assets and blockchain-based financial instruments in three jurisdictions selected for their instructive diversity and regulatory sophistication. The United States exemplifies a functionally fragmented regulatory model in which the Securities and Exchange Commission (SEC) exercises authority over instruments meeting the definition of securities under the Howey Test, while the Commodity Futures Trading Commission (CFTC) supervises commodity

derivatives and futures contracts, and prudential regulators exercise jurisdiction over financial institutions engaged in digital asset activities. Singapore demonstrates a more functionally integrated supervisory model under the Monetary Authority of Singapore (MAS), which exercises consolidated regulatory authority through a unified legal framework that clarifies application of payment services, securities, and financial institutions regulation to blockchain-based instruments. The European Union has developed a harmonized regulatory framework through the Markets in Crypto-Assets Regulation (Regulation (EU) 2023/1114), which became effective on December 29, 2024, establishing uniform definitions, licensing requirements, investor protection standards, and market conduct rules applicable throughout the European regulatory space [1], [4]. Comparative analysis identifies regulatory mechanisms, institutional arrangements, and definitional frameworks employed in these jurisdictions, evaluates their efficacy in achieving regulatory objectives, and examines mechanisms through which these approaches might inform reform of the Indonesian regulatory system while accounting for institutional particularities, constitutional constraints, and specific characteristics of Indonesia's financial markets and development context.

The research draws upon three hierarchically organized categories of legal materials established within Indonesian legal scholarship [10]. Primary legal materials comprise binding legal instruments including constitutional provisions, statutes, subordinate legislation, ministerial regulations, central bank directives, and international legal agreements to which Indonesia is a signatory. For cryptocurrency asset regulation specifically, primary materials include commodity futures trading legislation, securities market laws, financial services legislation, regulatory instruments issued by BAPPEBTI, OJK, and Bank Indonesia, administrative decisions and enforcement actions by regulatory authorities, pertinent provisions of the Criminal Code (KUHP) addressing fraud and money laundering, and Law Number 8 of 2010 on Prevention and Eradication of the Crime of Money Laundering. Secondary legal materials include peer-reviewed legal scholarship, monographs, legal commentary, and empirical research concerning financial regulation, blockchain technology, cryptocurrency markets, institutional design, and comparative legal analysis. Secondary sources are employed to establish doctrinal frameworks, identify scholarly consensus and disagreement, situate the Indonesian regulatory problem within international legal scholarship, and identify comparative insights from other jurisdictions. Tertiary legal materials including legal dictionaries, institutional reports, policy documents, technical standards, and reference materials provide definitional clarity, contextual information, and institutional background.

The research examines regulatory enforcement actions, administrative decisions, and judicial determinations arising from disputes concerning cryptocurrency asset classification and regulatory authority. Analysis of administrative and judicial jurisprudence serves multiple functions: it identifies interpretive approaches to existing legal instruments and how regulatory agencies have resolved ambiguities in the face of novel factual circumstances; it documents institutional responses to regulatory gaps and emerging risks; it reveals doctrinal tensions and conflicts within the current legal framework; and it identifies how courts have addressed jurisdictional disputes and conflicts of law concerning digital assets. By examining concrete disputes and institutional responses, this analytical dimension grounds abstract legal analysis in institutional practice and identifies practical constraints upon regulatory reform. This

case-analytical approach recognizes that jurisprudence both administrative and judicial constitutes an important source of legal development through which regulatory institutions adapt existing law to technological change and novel circumstances.

The investigation proceeds through a structured analytical framework organized around the central problematic of institutional fragmentation in cryptocurrency asset regulation and its implications for legal certainty, regulatory efficacy, and investor protection. The analytical progression follows this structure: first, identification and classification of discrete legal instruments and institutional arrangements currently applicable to cryptocurrency assets within Indonesia's regulatory architecture; second, systematic examination of conflicts, inconsistencies, and gaps in legal classification, definitional frameworks, and jurisdictional allocation; third, assessment of the adequacy of existing legal frameworks in addressing the technological, functional, and systemic characteristics of cryptocurrency assets and attendant regulatory risks; fourth, examination of comparative approaches from selected jurisdictions that have achieved greater regulatory integration; and finally, development of a coherent legal framework informed by doctrinal principles, comparative analysis, and technological understanding. Throughout the analytical process, particular attention is devoted to ensuring that legal reform recommendations remain grounded in Indonesian institutional contexts, constitutional parameters, and practical implementation capacities, while incorporating relevant insights from international legal experience and technological developments. This methodological approach aims to produce not merely academic analysis but rather actionable recommendations capable of informing legislative reform and institutional practice.

3. Results

3.1. Institutional Fragmentation and Regulatory Mapping

3.1.1 Jurisdictional Configuration and Statutory Authority

The analysis of Indonesia's cryptocurrency asset regulatory framework reveals a bifurcated institutional structure wherein two parallel supervisory regimes exercise overlapping authority over functionally identical digital assets. The commodity futures trading regime, administered by the Commodity Futures Trading Supervisory Agency (BAPPEBTI) under the Ministry of Trade, exercises statutory authority pursuant to Law Number 10 of 2011 concerning Commodity Futures Trading and related ministerial regulations. Specifically, the Ministry of Trade Regulation Number 99 of 2018 granted explicit recognition to cryptocurrency assets as tradable commodities, thereby establishing the foundational legal classification upon which BAPPEBTI's supervisory mandate rests. Concurrently, the Financial Services Authority (OJK), established pursuant to Law Number 21 of 2011, maintains potential jurisdictional claims over blockchain-based instruments meeting the definition of securities under Law Number 8 of 1995 on Capital Markets.

The enactment of Law Number 4 of 2023 concerning Financial Sector Development and Strengthening (UU P2SK) introduced a transitional institutional reallocation that neither definitively resolves nor eliminates the underlying jurisdictional ambiguity. The legislation effects a transfer of regulatory authority over cryptocurrency asset trading and custody arrangements from BAPPEBTI to the OJK

and Bank Indonesia during a specified implementation period. However, the statutory language establishing this transfer does not articulate clear doctrinal criteria for distinguishing cryptocurrency assets that remain subject to commodity futures regulation from those classified as securities requiring securities market oversight. Consequently, the institutional reallocation has been interpreted by market participants, regulatory agencies, and legal practitioners as introducing a period of regulatory uncertainty rather than clarifying the regulatory classification of digital assets.

3.1.2 Statutory Definitions and Conceptual Ambiguity

Detailed examination of primary legal instruments reveals a significant deficit in foundational legal definitions applicable to cryptocurrency assets. The commodity futures trading legislation defines derivatives contracts and commodity-related instruments with technical precision, establishing that a commodity constitutes any good, service, right, or interest capable of becoming the subject of a standardized or non-standardized derivative contract. Yet this definitional approach, while establishing an outer boundary of commodities subject to derivatives trading regulation, provides minimal guidance for distinguishing cryptocurrency assets with investment characteristics from those constituting payment mechanisms or technology protocols.

The capital markets legislation similarly fails to establish crystalline definitions of securities applicable to blockchain-based tokens. Law Number 8 of 1995 defines securities through reference to conventional debt obligations and equity interests, categories fundamentally distinct from the functional characteristics exhibited by cryptocurrency tokens. The legislation neither explicitly includes nor excludes digital tokens from the definition of securities, thereby creating interpretive ambiguity that regulatory agencies have addressed through informal guidance documents rather than binding statutory clarification.

This definitional lacuna produces substantive practical consequences. Market participants, including cryptocurrency exchanges, token issuers, and investment managers, face persistent uncertainty regarding the applicable statutory definition governing their activities. This uncertainty undermines rational commercial planning, inhibits legitimate market development, and creates opportunities for regulatory arbitrage whereby market actors exploit gaps between competing regulatory regimes.

3.2. Regulatory Disharmony: Conflicting Frameworks and Inconsistent Protections

3.2.1 Classification Conflicts and Functional Inconsistencies

Cryptocurrency assets demonstrate functional characteristics that systematically vary across categories of digital instruments. Detailed analysis of representative categories reveals the inadequacy of uniform commodity classification:

Table 1: Functional Characterization of Representative Cryptocurrency Assets

Asset Category	Primary Economic Function	Investment Characteristic	Trading Mechanism	Supervisory Classification
Bitcoin (BTC)	Medium of exchange; store of value	High speculation; long-term accumulation	Decentralized exchanges; spot markets	BAPPEBTI (commodity)
Ethereum	Blockchain	Investment/speculation	Centralized/decentralized	BAPPEBTI

(ETH)	protocol utility; transaction fees	hybrid	exchanges	(commodity)
Stablecoins (USDC, USDT)	Payment instrument; capital preservation	Minimal speculation; stability objective	Centralized exchanges; payment platforms	Regulatory ambiguity
Security tokens	Direct ownership representation	High investment orientation	Decentralized exchanges; limited liquidity	Regulatory gap
Governance tokens	Protocol participation; voting rights	Speculation + utility hybrid	Decentralized exchanges	Potential securities classification

This functional diversity demonstrates that cryptocurrency assets cannot be adequately regulated through a single uniform classification regime. Assets functioning primarily as payment mechanisms exhibit risk profiles and regulatory concerns distinct from those primarily utilized for speculative capital appreciation. The existing commodity futures classification treats all categories identically, thereby applying supervisory frameworks designed for standardized derivative contracts to assets requiring fundamentally different regulatory approaches.

3.2.2 Investor Protection Standards: Structural Inequities

The divergence between commodity futures regulation and securities market law generates substantive disparities in investor protection standards. Securities market legislation establishes mandatory disclosure requirements, insider trading prohibitions, market manipulation sanctions, and institutional safeguards including custodial standards, conflicts of interest management, and fiduciary duties that financial institutions owe to clients. Commodity futures regulation emphasizes margin requirements, clearing arrangements, and systemic risk management rather than comprehensive investor protection mechanisms analogous to those established within securities markets [11], [12],

Analysis of specific protection standards reveals material inequalities in investor safeguards across functionally similar instruments:

Table 2: Comparative Investor Protection Standards Securities Markets vs. Commodity Futures

Protection Category	Securities Market (OJK)	Commodity Futures (BAPPEBTI)	Gap Significance
Prospectus/Offering Disclosure	Comprehensive; mandatory	Minimal; exchange disclosure only	Critical disparity
Insider Trading Prohibition	Explicit statutory prohibition	Not explicitly addressed	Moderate to high
Market Manipulation Standards	Explicit definition; broad scope	Derivative-focused; limited	High
Custodial Requirements	Explicit segregation; bankruptcy protection	Exchange-based custody; emerging	Substantial

The disparity documented in Table 2 demonstrates that cryptocurrency asset investors receiving protection through commodity futures regulation face substantially inferior safeguards compared to securities market participants. This disparity proves particularly consequential given that the nature of investor harm whether resulting from fraudulent disclosure, manipulative trading, or institutional insolvency exhibits functional identity regardless of the classification regime under which the asset is regulated. The gap between frameworks produces outcomes wherein investors in functionally identical instruments receive unequal protection based solely upon regulatory jurisdiction.

3.3 Comparative Regulatory Analysis: International Approaches

3.3.1 United States: Fragmented Functional Approach

The United States regulatory framework addresses digital assets through a functionally disaggregated approach wherein multiple agencies exercise concurrent jurisdiction based on asset characteristics and transaction types. The Securities and Exchange Commission (SEC) exercises authority over instruments meeting the Howey Test definition of securities, which requires that an investment contract constitute an investment of money in a common enterprise with expectation of profits derived from entrepreneurial efforts of others [13], [14]. Under this framework, cryptocurrency tokens representing equity-like interests, governance mechanisms with economic value distributions, or participation in underlying business enterprises face potential classification as securities requiring registration unless qualifying for exemptions.

The Commodity Futures Trading Commission (CFTC) maintains authority over cryptocurrency assets classified as commodity derivatives and futures contracts. Through a series of enforcement actions and interpretive determinations, the CFTC has asserted jurisdiction over decentralized finance (DeFi) protocols, leveraged trading products, and cryptocurrency derivatives [15], [16]. Prudential regulators, including the Federal Reserve and Office of the Comptroller of the Currency, exercise authority over financial institutions maintaining cryptocurrency custody arrangements or offering cryptocurrency-related services to consumers.

The functional fragmentation characterizing United States regulation produces both advantages and disadvantages relative to unified regulatory approaches. The functional classification system permits regulatory differentiation based on actual asset characteristics and investor protection needs, avoiding inappropriate application of inappropriate regulatory frameworks to heterogeneous instruments. Conversely, the system generates complexity and regulatory arbitrage whereby market participants structure transactions to achieve optimal regulatory treatment rather than optimal market outcomes. Recent statutory developments, including provisions of the Financial Innovation and Technology Act and advancing legislation establishing a comprehensive digital assets regulatory framework, indicate recognition that the existing fragmented approach requires reform to address gaps, overlaps, and burdens upon financial innovation [13], [17].

3.3.2 Singapore: Integrated Functional Regulation

The Monetary Authority of Singapore (MAS) has developed a unified regulatory framework that integrates cryptocurrency asset governance within a comprehensive financial services regulation system. Under the Payment Services Act and Securities and Futures Act, cryptocurrency assets and blockchain-based financial products are subject to requirements determined by their functional characteristics and economic purpose rather than categorical labels. This functional approach provides a model for flexible regulation that adapts to technological innovation.

The Singapore framework establishes binding classifications determining supervisory authority: payment tokens utilized as media of exchange face regulation as payment services under the Payment Services Act; utility tokens providing access to blockchain-based services receive classification-specific treatment; security tokens representing ownership interests or entitlement to distributed cash flows face regulation as securities. This three-tiered taxonomy enables regulatory differentiation while maintaining clarity regarding applicable rules. Market participants benefit from explicit guidance and regulatory finality regarding applicable regulatory treatment [18], [19].

The Singapore approach generates advantages through regulatory clarity, reduced compliance complexity, and explicit coordination among regulatory agencies. The framework has facilitated significant market development in blockchain-based financial services while maintaining prudent risk management standards. However, international observers note that the Singapore framework assumes relatively robust institutional capacity for continuous monitoring and regulatory adaptation requirements potentially exceeding institutional capabilities in emerging market contexts [20].

3.3.3 European Union: Harmonized Comprehensive Framework

The European Union's Markets in Crypto-Assets Regulation (Regulation (EU) 2023/1114), which entered force on December 29, 2024, represents the most comprehensive and institutionally sophisticated regulatory framework for cryptocurrency assets to date. The MiCA framework establishes uniform definitions, licensing requirements, operational standards, and investor protection mechanisms applicable throughout the European regulatory space, thereby eliminating regulatory fragmentation across member states while creating a single regulatory market for compliant service providers.

The MiCA framework establishes several foundational regulatory innovations: (1) explicit statutory definitions of crypto-assets and various asset categories, eliminating interpretive ambiguity regarding applicability of existing financial regulations; (2) a comprehensive licensing regime for crypto-asset service providers, including exchanges, wallets, lending platforms, and staking service providers; (3) explicit requirements for issuers and distributors of cryptocurrency assets, including operational standards and consumer information requirements; (4) harmonized investor protection standards applicable to cryptocurrency markets, including market manipulation prohibitions, conflicts of interest management, and best-execution obligations; and (5) explicit provisions addressing stablecoins and asset-referenced tokens, establishing distinctions between fully-reserved stablecoins and other structured products [21].

The MiCA framework's comprehensive approach to regulatory integration and definitional clarity provides instructive comparison for jurisdictions developing cryptocurrency asset regulation. By establishing explicit definitions, clear allocations of regulatory authority, proportional supervisory requirements, and harmonized investor protections, the EU framework demonstrates the feasibility of developing coherent regulatory systems despite the technological complexity and rapid innovation characterizing cryptocurrency markets [22].

3.4 Findings on Disharmony Sources and Consequences

3.4.1 Root Causes of Regulatory Fragmentation

The analysis reveals four discrete but interrelated sources of disharmony within Indonesia's cryptocurrency asset regulatory framework:

First, Temporal Institutional Misalignment: The commodity futures regulatory framework was established in 1997-2011, substantially predating the emergence of cryptocurrency technologies and decentralized finance protocols. The regulatory apparatus established for standardized derivative contracts proves inadequate for regulating peer-to-peer transactions in assets without centralized issuers, clearing arrangements, or conventional market infrastructure.

Second, Doctrinal Conceptual Imprecision: Both the commodity futures and securities regulatory regimes rest upon foundational legal concepts established in earlier historical periods. Neither regime articulates contemporary definitions of investment, speculation, asset-backed instruments, or technology-mediated financial services applicable to blockchain-based systems.

Third, Institutional Incentive Misalignment: BAPPEBTI and OJK maintain distinct institutional mandates, constituencies, and regulatory philosophies. BAPPEBTI, housed within the Ministry of Trade, emphasizes commodity market development and trading venue regulation. OJK, as the unified financial services regulator, prioritizes investor protection and financial stability. These distinct mandates generate conflicting approaches to cryptocurrency asset regulation.

Fourth, Jurisdictional Transition and Uncertainty: The UU P2SK effects a jurisdictional transfer from BAPPEBTI to OJK/Bank Indonesia during a transitional period. However, the statute neither establishes binding timelines for implementation nor provides detailed guidance regarding application of securities and banking regulation to cryptocurrency assets.

3.4.2 Documented Consequences of Regulatory Disharmony

The fragmented regulatory framework produces measurable consequences manifest in market participant behavior, investment flows, and institutional risk accumulation: (1) Regulatory Arbitrage whereby market participants structure cryptocurrency activities to achieve favorable regulatory treatment rather than optimal economic outcomes; (2) Investor Harm and Vulnerability arising from disparity between investor protection standards; (3) Capital Flight wherein regulatory uncertainty creates incentives for capital outflow toward foreign exchanges; and (4) Institutional Risk Accumulation from absence of coordinated prudential regulation over financial institutions accepting cryptocurrency deposits [23].

4. Discussion

The disharmony documented in preceding sections reflects fundamental tensions between regulatory frameworks designed for conventional twentieth-century financial instruments and the technological and functional characteristics of decentralized twenty-first-century digital assets. This disharmony demonstrates the classical tension articulated by Radbruch between the ideal of coherent law emphasizing consistency, predictability, and logical coherence and the pragmatic reality that legal institutions respond to technological innovation through incremental extensions of existing frameworks rather than comprehensive doctrinal reconstruction [6], [24]. The commodity futures classification of cryptocurrency assets exemplifies this adaptive response: facing novel decentralized digital assets without precedent in prior regulatory experience, Indonesian regulatory authorities extended the commodity classification because existing institutional structures and regulatory expertise addressed commodity market oversight. From an institutional efficiency perspective, this approach proved rational; from a doctrinal perspective, however, it represented classification based on regulatory convenience rather than functional congruence between regulatory framework and subject matter. The subsequent enactment of UU P2SK, effecting jurisdictional reallocation to OJK and Bank Indonesia, reflects growing recognition of this doctrinal inadequacy, though the statute fails to articulate clear definitional criteria or functional classifications capable of resolving the underlying doctrinal problem [12], [25].

International regulatory experience, particularly in Singapore and the European Union, demonstrates that comprehensive regulatory coherence requires not merely institutional reallocation but explicit statutory definitions, functional classifications, and risk-based regulatory approaches calibrated to identifiable asset characteristics and regulatory risks [5], [13]. The European Union's Markets in Crypto-Assets Regulation (MiCA) framework, which entered force on December 29, 2024, provides instructive model through its establishment of explicit statutory definitions of crypto-assets and various categories, comprehensive licensing regimes for service providers, harmonized investor protection standards, and explicit provisions addressing stablecoins and asset-referenced tokens [21], [22]. Singapore's functional classification framework similarly establishes binding categories determining supervisory authority: payment tokens face regulation as payment services, utility tokens receive classification-specific treatment, and security tokens face regulation as securities [18], [19]. These approaches demonstrate the feasibility of developing coherent regulatory systems despite technological complexity and rapid innovation. Indonesia's cryptocurrency asset regulatory challenge presents substantial opportunity for implementing functional and risk-based approaches establishing statutory definitions of major cryptocurrency asset categories (payment tokens, utility tokens, security tokens, governance tokens, stablecoins) with regulatory standards calibrated to identifiable risks, thereby achieving multiple regulatory objectives: enhancing legal certainty through explicit frameworks, advancing proportionality by calibrating regulatory burden to identifiable risks, accommodating technological diversity through regulatory differentiation, and facilitating institutional coordination through clear authority boundaries [5], [13], [14]. Such reform requires institutional capacity development for cryptocurrency asset classification, establishment of inter-agency coordination mechanisms to prevent fragmentation characteristic of BAPPEBTI-OJK relationship, and development of

procedures for monitoring technological evolution and adapting regulatory frameworks as new categories emerge.

The regulatory fragmentation documented in this analysis carries implications extending beyond technical regulatory concerns to fundamental investor protection and systemic financial stability. Cryptocurrency investors in Indonesia face substantively inferior protective frameworks compared to securities market investors lacking comprehensive disclosure requirements, insider trading prohibitions, market manipulation standards, and custodial safeguards characteristic of securities regulation [11]. This disparity proves particularly consequential because cryptocurrency markets exhibit heightened fraud vulnerability, including misrepresentation of token functionality, undisclosed conflicts of interest, market manipulation, and institutional insolvency arising from inadequate capital reserves, to which Indonesian investors remain vulnerable through commodity futures regulation's limited investor protections [11]. Moreover, the technical characteristics of decentralized bearer instruments lacking centralized custody arrangements or bankruptcy protections create vulnerability to uncompensable losses through institutional failure [26]. From a systemic perspective, although cryptocurrency markets remain peripheral to Indonesia's broader financial system, rapid growth and increasing integration with conventional financial institutions creates potential for systemic risk escalation through direct risk exposure, contagion risk from counterparty interconnectedness, liquidity risk from rapid asset devaluation, and operational risk from institutional failures as demonstrated by the 2022 cryptocurrency market collapse and FTX insolvency [27]. The regulatory fragmentation prevents comprehensive monitoring and risk assessment: BAPPEBTI's surveillance systems monitor standardized derivatives rather than decentralized peer-to-peer transactions, while OJK's systems focus on securities markets with limited visibility into cryptocurrency market activities, creating conditions wherein systemic risks accumulate unmonitored [20], [25]. Therefore, comprehensive regulatory reform through legislative amendment of UU P2SK establishing explicit definitions and functional classifications, formal inter-agency coordination mechanisms, and clear implementation timelines represents both urgent necessity for protecting investor interests and prerequisite for maintaining financial stability as Indonesia's cryptocurrency markets continue developing.

5. Conclusions

The accelerated development of cryptocurrency markets has fundamentally challenged the adequacy of Indonesia's existing regulatory architecture, creating conditions wherein parallel supervisory regimes exercising overlapping jurisdictional authority produce institutional fragmentation, legal ambiguity, and substantive regulatory inconsistencies. The commodity futures classification of cryptocurrency assets, implemented through Ministry of Trade Regulation Number 99 of 2018, represented a pragmatic institutional response to market developments but has proven increasingly inadequate for addressing the functional characteristics, investment orientation, and systemic risk implications of contemporary digital asset markets. The bifurcated regulatory regime wherein BAPPEBTI supervises cryptocurrency assets classified as commodities while OJK maintains potential securities jurisdiction—generates persistent uncertainty regarding applicable regulatory standards, investor protection safeguards, and institutional accountability mechanisms.

The analysis presented herein demonstrates that regulatory harmonization represents both an urgent institutional necessity and substantive legal imperative. Investors in cryptocurrency assets receive disparate protective standards based solely upon regulatory jurisdiction despite the functional identity of investor risks. Cryptocurrency investors lack comprehensive disclosure requirements, insider trading prohibitions, market manipulation standards, and custodial safeguards characteristic of securities regulation, creating vulnerability to fraud patterns including misrepresentation, conflicts of interest, market manipulation, and institutional insolvency that generate concrete harms to identifiable investor populations. From a systemic perspective, the regulatory fragmentation prevents comprehensive monitoring of institutional risk concentration and interconnectedness with conventional financial institutions, thereby creating conditions wherein risks accumulate unmonitored and potentially erupt with cascading consequences analogous to international cryptocurrency market failures and institutional insolvencies documented in recent years.

Comprehensive regulatory reform through amendment of Law Number 4 of 2023 to establish explicit statutory definitions, functional asset classifications based on economic characteristics, clear regulatory authority boundaries, unified licensing frameworks for service providers, and harmonized investor protection standards represents the optimal pathway toward achieving legal certainty, protecting investor interests, and maintaining financial stability. Such reform should prioritize inter-agency coordination mechanisms institutionalized through formal memoranda of understanding, joint task forces, and harmonized regulatory guidance to prevent recurrence of institutional fragmentation characterizing the BAPPEBTI-OJK relationship. Implementation should proceed through phased procedures permitting existing market participants transitional periods to achieve regulatory compliance while establishing binding timelines and clear transition procedures for asset reclassification. The regulatory reform process should incorporate institutional capacity development investments enabling cryptocurrency asset classification expertise, continuous monitoring of technological innovation, and adaptive regulatory procedures for emerging digital asset categories. While international regulatory experience from the United States, Singapore, and European Union provides instructive approaches, regulatory reform must respect Indonesia's existing institutional arrangements, constitutional parameters, and development context while incorporating relevant insights from international legal experience and technological developments. Ultimately, regulatory coherence in cryptocurrency asset governance serves not merely as a technical legal improvement but as a foundational prerequisite for sustainable development of Indonesia's digital finance ecosystem, expansion of financial inclusion through technology-enabled services, and protection of investor interests within an increasingly technology-mediated financial system.

References

[1] K. Yeung, “Regulation by Blockchain: The Emerging Battle for Supremacy between the Code of Law and Code as Law,” *Mod. Law Rev.*, Jul. 2018.

[2] S. Nakamoto, “Bitcoin : A Peer-to-Peer Electronic Cash System,” 2008.

[3] Indonesia, *Ministry of Trade Regulation Number 99 of 2018 concerning General Policy on the Implementation of Commodity Futures Trading on Cryptocurrency Assets*. 2018.

[4] J. Sharma, "Blockchain technology adoption in financial services: Opportunities and challenges," *Revolutionizing Financ. Serv. Mark. Through FinTech Blockchain*, pp. 99–117, Jul. 2023, doi: 10.4018/978-1-6684-8624-5.CH007.

[5] D. H. Kanu, "Regulation of Cryptocurrency and its Implication for Financial Stability. A Qualitative Analysis.," *Int. J. Econ. Bus. Manag. Res.*, vol. 09, no. 04, pp. 223–269, 2025, doi: 10.51505/IJEBMR.2025.9416.

[6] J. Black, *Rules and Regulators*. Oxford University Press, 2002.

[7] Indonesia, *Law Number 10 of 2011 amending Law Number 32 of 1997 on Commodity Futures Trading*. 2011.

[8] Indonesia, *Law Number 8 of 1995 on Capital Markets. State Gazette of the Republic of Indonesia Year 1995 Number 64*. 1995.

[9] Indonesia, *Law Number 21 of 2011 on Financial Services Authority. State Gazette of the Republic of Indonesia Year 2011 Number 111*. 2011.

[10] J. W. Salmond and P. J. Fitzgerald, *Salmond on Jurisprudence*. Sweet & Maxwell, 1966.

[11] H. C. Hsieh and J. Oppermann, "Initial coin offerings and their initial returns," *Asia Pacific Manag. Rev.*, vol. 26, no. 1, pp. 1–10, Mar. 2021, doi: 10.1016/J.APMRV.2020.05.003.

[12] S. V. Muradyan, "Digital Assets: Legal Regulation and Estimation of Risks," *J. Digit. Technol. Law*, vol. 1, no. 1, pp. 123–151, Mar. 2023, doi: 10.21202/jdtl.2023.5.

[13] G. Buckley, T. Caulfield, and I. Becker, "How might the GDPR evolve? A question of politics, pace and punishment," *Comput. Law Secur. Rev.*, vol. 54, p. 106033, Sep. 2024, doi: 10.1016/j.clsr.2024.106033.

[14] M. Busari, "Legal and Regulatory Frameworks for DeFi-based Securitization Across Jurisdictions | Request PDF," 2025.

[15] D. A. Zetzsche, D. W. Arner, and R. P. Buckley, "Decentralized Finance (DeFi)," *SSRN Electron. J.*, pp. 172–203, Sep. 2020, doi: 10.2139/SSRN.3539194.

[16] E. Abigail and D. Alex, "Regulatory Approaches to Decentralized Finance (DeFi) Across Jurisdictions." Accessed: Jun. 10, 2026. [Online]. Available: https://www.researchgate.net/publication/391498215_Regulatory_Approaches_to_Decentralized_Finance_DeFi_Across_Jurisdictions

[17] J. Smith, E. Johnson, M. Williams, O. Brown, and M. Yusuff, "International Coordination for Digital Currency Regulatory Harmonization," 2025.

[18] M. H. Sufian, N. A. Sutan Syahril, and N. Ghapa, "Regulatory Framework for Cryptocurrency: A Comparative Analysis of Malaysia, Indonesia and

Singapore," *Malaysian J. Soc. Sci. Humanit.*, vol. 9, no. 11, p. e003113, Nov. 2024, doi: 10.47405/mjssh.v9i11.3113.

[19] P. De Filippi, M. Mannan, and W. Reijers, "Blockchain Technology and the Rule of Code: Regulation via Governance," *George Washington Law Rev.*, vol. 92, no. 6, pp. 1229–1279, Dec. 2024, doi: 10.2139/SSRN.5086109.

[20] I. I. Glotova and E. P. Tomilina, "Cryptocurrency Market Regulation: A Comparative Analysis of Different Countries' Approaches," *Ekon. I Upr. Probl. RESHENIYA*, vol. 11/5, no. 164, pp. 106–114, 2025, doi: 10.36871/EK.UP.P.R.2025.11.05.012.

[21] D. R. Whitman, L. K. Peterson, M. A. Brooks, S. J. Nolan, and D. Esther, "Stablecoins and Financial Market Regulation," 2025.

[22] I. Ijuo, "Markets in Crypto-Assets (MICA): EU Regulatory Compliance Framework and What It Means for Crypto Companies.," 2024.

[23] P. J. S. Ferreira and J. É. Pereira, "Contagion Effect in Cryptocurrency Market," *J. Risk Financ. Manag.*, vol. 12, no. 3, Sep. 2019, doi: 10.3390/JRFM12030115.

[24] G. Radbruch, "Statutory Lawlessness and Supra-Statutory Law," *Oxf. J. Leg. Stud.*, vol. 26, no. 1, pp. 1–11, 2006.

[25] M. Javaid, A. Haleem, R. P. Singh, R. Suman, and S. Khan, "A review of Blockchain Technology applications for financial services," *BenchCouncil Trans. Benchmarks, Stand. Eval.*, vol. 2, no. 3, p. 100073, Jul. 2022, doi: 10.1016/j.tbench.2022.100073.

[26] K. Oosthoek and C. Doerr, "Cyber Security Threats to Bitcoin Exchanges: Adversary Exploitation and Laundering Techniques," *IEEE Trans. Netw. Serv. Manag.*, vol. 18, no. 2, pp. 1616–1628, Jun. 2021, doi: 10.1109/TNSM.2020.3046145.

[27] Financial Action Task Force (FATF), "Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers." Accessed: Jun. 10, 2026. [Online]. Available: https://www.fatf-gafi.org/en/publications/Fatfrecommendations/Guidance-rba-virtual-assets.html

Authors:

[1]**Made Warka** – Faculty of Law, Universitas 17 Agustus 1945 Surabaya, Semolowaru Street No. 45, Sukolilo District, Surabaya City, East Java 60118, Indonesia, e-mail: made@untag-sby.ac.id

[2]**Merline Eva Lyanthi** – Faculty of Law, Universitas 17 Agustus 1945 Surabaya, Semolowaru Street No. 45, Sukolilo District, Surabaya City, East Java 60118, Indonesia, e-mail: merlinelyanthi@untag-sby.ac.id