

Reconstructing Fiduciary Security for Digital Assets in Indonesia: Priority, Publicity, and Enforcement Gaps

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Abstract

The legal problem addressed in this article is no longer whether digital assets possess economic value, but whether Indonesian fiduciary law can create an effective, opposable, and enforceable security interest over assets whose ownership and control are mediated by cryptographic or custodial systems. This study uses doctrinal legal research with statutory, conceptual, case, and comparative approaches. It analyses Law No. 42 of 1999 on Fiduciary Guarantees, the financial-sector framework for digital financial assets and crypto assets, Constitutional Court Decisions No. 18/PUU-XVII/2019 and No. 2/PUU-XIX/2021, and comparative developments in Singapore and the 2022 amendments to the United States Uniform Commercial Code. The study finds that the broad statutory concept of a fiduciary object can conceptually include transferable digital assets, but regulatory recognition of crypto assets does not by itself solve the private-law requirements of specialty, publicity, priority, and enforcement. The principal gap is therefore operational rather than merely

definitional: the fiduciary register is not integrated with technical control or regulated custody, while self-custodied assets can be transferred without the creditor's factual control. The article proposes a two-stage reconstruction that separates asset eligibility from security operability. It recommends technology-neutral eligibility criteria, digital-specific identification standards, registration linked to verifiable control or custodian notice, clearer priority and proceeds rules, and due-process-compliant enforcement. This reconstruction preserves the closed structure of property security while adapting its mechanisms to digital collateral.

KEYWORDS: *Digital Assets, Fiduciary Security, Crypto Assets, Priority, Enforcement*

Introduction

Digital assets have moved from being peripheral technological objects to regulated components of Indonesia's financial ecosystem. That development makes a narrower private-law question unavoidable: when a crypto asset, non-fungible token, tokenized claim, or other transferable digital asset is offered as collateral, can the Indonesian fiduciary regime create a security right that is sufficiently specific, public, preferential, and enforceable against third parties? The issue is distinct from the digitization of fiduciary certificates. Electronic administration changes the medium of an existing legal process; digital collateral changes the nature of the object, the manner in which control is exercised, and the channels through which the object can be transferred. The relevant inquiry is therefore not whether technology should be accommodated in the abstract, but whether the constituent elements of a proprietary security right can operate when the collateral exists and circulates through digital infrastructure.¹

The urgency of updating the legal protection framework through fiduciary guarantees for digital assets in Indonesia is directly proportional to the global trend of security interests reform, which is currently adapting to the rapid

¹ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

digitalization of the economy. Indonesia's shift from merely regulatory recognition of digital assets in the financial sector toward refining civil law requirements, such as specialization, publicity, priority, and enforceability, is fully aligned with the international discourse aimed at ensuring legal certainty for both creditors and debtors. This is reflected in the adoption of the Controllable Electronic Records framework in the commercial code of the United States, the judicial recognition of property rights in digital assets in Singapore, the harmonization of the framework for digital financial instruments in the European Union, the adaptation of fiduciary security mechanisms and proposals for security interests in crypto assets in France, and the formulation of principles of private law and digital assets by the European Law Institute and UNIDROIT. Thus, the restructuring of digital fiduciary guarantees in Indonesia is not merely a domestic necessity to mitigate the risk of irregularities and protect the rights of the parties, but an integral part of the global convergence of commercial law in aligning the protection of property rights with the dynamics of the modern digital market.

Law No. 42 of 1999 on Fiduciary Guarantees provides the starting point. Contrary to a narrow reading that limits fiduciary objects to conventional movables, Article 1(2) defines fiduciary security as a security right over tangible or intangible movable property, and Article 1(4) defines an object broadly as anything capable of ownership and transfer, whether tangible or intangible, registered or unregistered, movable or certain immovable property not subject to mortgage or hypothec. The statute then builds legal effectiveness through a notarial deed and object description, registration, preferential status, priority based on registration, and execution mechanisms. These provisions are broad enough to open a doctrinal pathway for some digital assets, but they were designed without rules for cryptographic control, custody accounts, or on-chain transfers.²

The regulatory environment has also changed materially since the Fiduciary Guarantee Law was enacted. The Financial Sector Development and Strengthening framework regulates digital financial assets, including crypto assets, and the current framework must be read together with its 2026 amendment. Regulation and supervision were transferred into the financial-sector architecture, and OJK Regulation No. 27 of 2024, as amended

² Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

by OJK Regulation No. 23 of 2025, now governs the organization and conduct of digital financial asset and crypto-asset trading. These developments establish that crypto assets are no longer legally invisible. They do not, however, answer a different question: whether a regulated digital asset is, in a particular transaction, an object over which a fiduciary security right can validly attach, obtain third-party effect, take priority, and be enforced.³⁴⁵

Previous Indonesian scholarship has already identified the possibility that economically valuable digital assets may become collateral and has called for a reconceptualization of property categories. Asmara, Abubakar, and Handayani, for example, examined digital assets and their potential as collateral at a time when the post-P2SK regulatory architecture did not yet exist. The remaining research gap is therefore not simply whether digital assets can be called “property.” The unresolved problem is the secured-transactions chain after regulatory recognition: how the debtor’s entitlement should be classified; how a digital object is described with sufficient specialty; how registration can produce meaningful publicity where factual control may be transferred instantly; how competing claims should be ranked; and how execution can comply with both the technical architecture of the asset and constitutional due process.⁶

This article accordingly narrows “digital assets” into legally relevant categories rather than treating every electronic resource as equivalent. Native crypto assets and NFTs may be controlled through cryptographic credentials; custodied crypto assets may involve a combination of proprietary, contractual,

³ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

⁴ Republic of Indonesia, Peraturan Pemerintah Nomor 49 Tahun 2024 tentang Peralihan Tugas Pengaturan dan Pengawasan Aset Keuangan Digital Termasuk Aset Kripto serta Derivatif Keuangan, Lembaran Negara Republik Indonesia Tahun 2024 Nomor 405, Tambahan Lembaran Negara Republik Indonesia Nomor 7090.

⁵ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

⁶ Teguh Tresna Puja Asmara, Lastuti Abubakar, and Tri Handayani, “Digital Assets: The Idea of Indonesian Property Law Reform and Its Potential as a Collateral Object,” *Hasanuddin Law Review* 5, no. 3 (2020): 278-88, <https://doi.org/10.20956/halrev.v5i3.1735>.

and regulatory relationships with a licensed intermediary; tokenized receivables may represent an underlying claim; and platform accounts, data sets, or software licenses may be non-transferable or transferable only subject to contract. The legal classification of each category determines whether fiduciary security is available. A security regime that ignores these differences risks either over-inclusion, by treating non-transferable contractual permissions as property, or under-inclusion, by excluding transferable digital assets merely because they have no physical form.⁷⁸

Three research questions structure the analysis. First, under what criteria can a digital asset qualify as an object of fiduciary security under Indonesian property and financial-sector law? Second, where do the existing rules on specialty, publicity, priority, and enforcement fail when applied to crypto assets and other transferable digital assets? Third, what legal reconstruction can close those gaps without replacing the statutory fiduciary register with private technological arrangements or sacrificing the procedural safeguards required by the Constitutional Court? These questions deliberately place asset classification before security creation, and security creation before priority and enforcement, so that the argument follows the doctrinal sequence of a secured transaction.

The article's original contribution is a two-stage model of digital fiduciary collateral. Stage one is asset eligibility: the asset must be identifiable, economically valuable, legally transferable, and subject to an entitlement or control that the debtor can validly encumber. Stage two is security operability: the fiduciary right must be created and registered in a manner that makes the encumbrance traceable, preserves priority, and provides a lawful route to control and liquidation after default. This distinction explains why public-law recognition of crypto assets is important but insufficient. It also permits reconstruction within the existing civil-law structure: the state remains the source of the security right and its priority, while technological control and regulated custody become evidentiary and operational mechanisms supporting that right rather than substitutes for it.

This study is doctrinal or normative legal research. It uses four complementary approaches. The statutory approach examines the Civil Code, Law No. 42 of 1999 on Fiduciary Guarantees, the P2SK framework as amended

⁷ Christiane Wendehorst, "Proprietary Rights in Digital Assets and the Conflict of Laws," in *Blockchain and Private International Law*, ed. Andrea Bonomi, Matthias Lehmann, and Shaheez Lalani (Leiden: Brill | Nijhoff, 2023), 101-27, https://doi.org/10.1163/9789004514850_007.

⁸ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

in 2026, Government Regulation No. 49 of 2024, OJK regulations on digital financial asset and crypto-asset trading, and the provisions governing electronic information where relevant. The conceptual approach distinguishes property rights, personal rights, control, transferability, publicity, and priority. The case approach analyses Constitutional Court Decisions No. 18/PUU-XVII/2019 and No. 2/PUU-XIX/2021 and the Singapore High Court's decision in *Janesh*. The comparative approach uses Singapore and the 2022 UCC amendments in the United States because they illustrate two different techniques: judicial recognition of digital property and statutory adaptation of secured-transactions rules.⁹¹⁰¹¹¹²¹³¹⁴¹⁵¹⁶

Primary legal materials are treated hierarchically and are distinguished from policy or technical material. Indonesian statutes, regulations, and

⁹ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹⁰ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

¹¹ Republic of Indonesia, Peraturan Pemerintah Nomor 49 Tahun 2024 tentang Peralihan Tugas Pengaturan dan Pengawasan Aset Keuangan Digital Termasuk Aset Kripto serta Derivatif Keuangan, Lembaran Negara Republik Indonesia Tahun 2024 Nomor 405, Tambahan Lembaran Negara Republik Indonesia Nomor 7090.

¹² Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

¹³ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹⁴ Constitutional Court of the Republic of Indonesia, Decision No. 2/PUU-XIX/2021, August 31, 2021, rejecting a further challenge concerning the execution of fiduciary security, <https://jdih.mkri.id/produk-hukum/putusan>.

¹⁵ *Janesh s/o Rajkumar v Unknown Person ("CHEFPIERRE")* [2022] SGHC 264; Singapore Judiciary, "Janesh s/o Rajkumar v Unknown Person," case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

¹⁶ Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

Constitutional Court decisions supply the binding domestic framework. Foreign law is used functionally, not transplanted mechanically: the comparison asks which legal problem a foreign rule solves and whether that solution is compatible with Indonesian fiduciary principles. Secondary materials are limited to peer-reviewed scholarship and institutional sources that can be independently verified. Particular attention is given to scholarship on Indonesian digital assets, proprietary treatment of digital assets, crypto custody, digital collateral, and the Janesh litigation. The analysis reflects the law and regulations in force as of October 2026, so earlier commodity-based descriptions of crypto regulation are not treated as the current regulatory position.¹⁷¹⁸¹⁹²⁰²¹

The analytical technique is a structured legal syllogism applied across the life cycle of the security. The first step identifies the debtor's legally transferable interest. The second tests whether that interest satisfies the statutory concept of a fiduciary object. The third examines creation and specialty, followed by registration and publicity. The fourth evaluates priority against competing creditors and transferees, including problems of fungibility, commingling, substitution, and custody. The fifth examines enforcement under Article 15 and Article 29 of Law No. 42 of 1999 as constitutionally interpreted. The final step reconstructs rules only where the preceding analysis identifies a specific normative or operational gap. This method prevents the reform proposal from being driven by technological novelty alone and keeps the proposed rules anchored in existing property-law functions.²²²³

¹⁷ Teguh Tresna Puja Asmara, Lastuti Abubakar, and Tri Handayani, "Digital Assets: The Idea of Indonesian Property Law Reform and Its Potential as a Collateral Object," *Hasanuddin Law Review* 5, no. 3 (2020): 278-88, <https://doi.org/10.20956/halrev.v5i3.1735>.

¹⁸ Christiane Wendehorst, "Proprietary Rights in Digital Assets and the Conflict of Laws," in *Blockchain and Private International Law*, ed. Andrea Bonomi, Matthias Lehmann, and Shaheza Lalani (Leiden: Brill | Nijhoff, 2023), 101-27, https://doi.org/10.1163/9789004514850_007.

¹⁹ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

²⁰ Timothy Chan and Kelvin F. K. Low, "DeFi Common Sense: Crypto-Backed Lending in Janesh s/o Rajkumar v Unknown Person ('CHEFPIERRE')," *The Modern Law Review* 86, no. 5 (2023): 1278-93, <https://doi.org/10.1111/1468-2230.12804>.

²¹ Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

²² Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

²³ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced

Regulatory Recognition and Fiduciary Eligibility of Digital Assets

The first question is whether Indonesian law already contains a doctrinal gateway for digital collateral. Article 1(4) of Law No. 42 of 1999 is broader than the conventional examples that dominated fiduciary practice. Its definition covers anything capable of ownership and transfer, including intangible and unregistered property. Article 1(2) similarly contemplates intangible movable objects as collateral. The statutory language therefore does not justify a categorical conclusion that a crypto asset is excluded merely because it lacks physical form. The decisive issue is whether the particular digital asset can be legally owned or otherwise held as a transferable asset by the debtor and whether the interest being encumbered can be sufficiently identified. This reading is more faithful to the statutory text than attempting to force every digital asset into a single pre-digital category.²⁴

That broad wording must nevertheless be read within the civil-law architecture of property security. The *numerus clausus* logic of property rights does not necessarily require the legislature to list every new economic object, but it does require the legal effects of a proprietary security right, especially opposability, preference, and priority, to rest on rules that are sufficiently determinate and public. Parties may innovate contractually, yet a contract cannot by itself create *erga omnes* priority against third parties beyond what the law recognizes. This is why the central problem is not the abstract existence of “digital property.” Even where the debtor has a valuable transferable digital asset, the secured transaction must still pass through the statutory mechanisms that create and publicize fiduciary security.²⁵

The historical context of Law No. 42 of 1999 explains why this operational gap exists without assuming that the legislature intended to prohibit

in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

²⁴ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

²⁵ Christiane Wendehorst, “Proprietary Rights in Digital Assets and the Conflict of Laws,” in *Blockchain and Private International Law*, ed. Andrea Bonomi, Matthias Lehmann, and Shaheez Lalani (Leiden: Brill | Nijhoff, 2023), 101-27, https://doi.org/10.1163/9789004514850_007.

future digital assets. The statute was enacted before blockchain-based crypto assets existed. Its General Elucidation and practical architecture addressed familiar financing objects such as inventory, merchandise, receivables, machinery, and motor vehicles and expanded protection beyond earlier piecemeal fiduciary practice. Those examples could be described in an authentic deed, registered in a central state system, physically possessed by the debtor, and, at least conceptually, located for enforcement. The statute was therefore technologically open at the level of object definition but technologically specific in the assumptions embedded in its administrative and enforcement machinery. Digital assets expose this difference between an open definition and a pre-digital operational design.²⁶

The later financial-sector framework changes one part of that picture. Law No. 4 of 2023, as currently amended by Law No. 4 of 2026, recognizes digital financial assets and places crypto-asset activities within a regulated financial-sector environment. Government Regulation No. 49 of 2024 implemented the transfer of regulatory and supervisory responsibilities, and OJK's rules now govern trading infrastructure, licensing, governance, consumer protection, and related activities. This public-law recognition matters for fiduciary analysis because it supplies legally supervised intermediaries, records, and market infrastructure that did not exist when Law No. 42 of 1999 was enacted. It also confirms that the economic value and transfer of crypto assets are legally regulated phenomena rather than merely private technological practices.^{27,28,29}

²⁶ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

²⁷ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

²⁸ Republic of Indonesia, Peraturan Pemerintah Nomor 49 Tahun 2024 tentang Peralihan Tugas Pengaturan dan Pengawasan Aset Keuangan Digital Termasuk Aset Kripto serta Derivatif Keuangan, Lembaran Negara Republik Indonesia Tahun 2024 Nomor 405, Tambahan Lembaran Negara Republik Indonesia Nomor 7090.

²⁹ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and

Public-law recognition, however, must not be conflated with private-law proprietary effect. A statute may regulate an asset as a financial product, investment instrument, taxable item, or object of supervised trading without deciding every question about ownership, third-party claims, insolvency segregation, or collateral priority. The P2SK and OJK frameworks therefore strengthen the case that certain crypto assets are legitimate economic assets, but they do not automatically create a fiduciary lien, determine whether every token is transferable by the debtor, or displace the creation and registration requirements of Law No. 42 of 1999. The doctrinal task is to connect the two regimes: financial regulation establishes lawful market infrastructure; fiduciary law must determine whether and how a proprietary security right attaches to an asset within that infrastructure.³⁰³¹

A technology-neutral eligibility test is consequently preferable to a statutory list of token types. A digital asset should be eligible for fiduciary security only if five cumulative elements can be established: it is legally identifiable; it has economic value capable of valuation; the debtor has a legally cognizable entitlement or control over it; the asset or the debtor's interest is transferable or assignable; and no statute, regulatory restriction, or governing contract prohibits the proposed encumbrance. These criteria derive from the functions already implicit in fiduciary law. Identification supports specialty; transferability makes disposition and enforcement legally possible; debtor entitlement prevents a creditor from taking security over another person's asset; and lawful transfer ensures that the purported collateral can actually be realized.³²

<https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

³⁰ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

³¹ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

³² Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia

Native crypto assets provide the clearest example of why eligibility and control must be separated conceptually. A private key is not the asset itself; it is a credential enabling a person to sign transactions affecting assets associated with a blockchain address. Treating the key as the fiduciary object would misidentify the collateral and create security risks. The relevant object is the transferable digital asset or legally recognized interest recorded through the network, while the key or other control mechanism is evidence of practical capability to dispose of that object. This distinction allows a fiduciary deed to describe the asset without disclosing secret credentials and permits control arrangements to be designed separately from the definition of the secured object.³³

NFTs illustrate another aspect of the same test. Uniqueness can make identification easier because a token may be associated with a specific smart-contract address and token identifier. Yet the token must not be confused with intellectual-property rights in the referenced artwork, media, or other content. The fiduciary object is the transferable token and whatever legally enforceable rights accompany it, not every external right or economic expectation associated with the token. The Singapore High Court's treatment of an NFT in *Janesh* demonstrates that a digital token may satisfy conventional indicia of property, but the case does not justify assuming that all metadata-linked rights are automatically proprietary or transferable.^{34,35}

Custodied crypto assets require a different analysis because legal entitlement and technical control may be separated. A customer may have an account-based claim against a custodian, a beneficial or proprietary interest in segregated assets, or a contractual entitlement shaped by the custodian's terms and regulatory obligations. The exact legal character matters for collateral. If the debtor can only assert a contractual claim, the fiduciary object may be that claim rather than a direct proprietary interest in specific units of crypto. If the assets are segregated and the customer retains a recognizable proprietary entitlement, the security analysis may attach to the identified digital assets. Empirical work

Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

³³ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

³⁴ *Janesh s/o Rajkumar v Unknown Person ("CHEFPIERRE")* [2022] SGHC 264; Singapore Judiciary, "Janesh s/o Rajkumar v Unknown Person," case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

³⁵ Timothy Chan and Kelvin F. K. Low, "DeFi Common Sense: Crypto-Backed Lending in *Janesh s/o Rajkumar v Unknown Person* ('CHEFPIERRE')," *The Modern Law Review* 86, no. 5 (2023): 1278-93, <https://doi.org/10.1111/1468-2230.12804>.

on crypto custody confirms that custody terms differ substantially on segregation, key storage, reuse, insolvency protection, and customer entitlements, which makes transaction-specific legal classification essential.³⁶

Platform accounts, software licenses, domain-related interests, commercial data, and monetization rights cannot be grouped automatically with crypto assets. Some are transferable rights; others are revocable permissions or contractual licenses subject to anti-assignment provisions and platform terms. Their economic value is not enough. Under a property-security analysis, a non-transferable license cannot be made transferable merely by calling it collateral. The correct approach is to identify the underlying legal right first and then determine whether that right is an intangible object capable of assignment or encumbrance. This prevents a recurring category error in digital-asset scholarship: equating market value with property status and property status with collateral eligibility.³⁷³⁸

The eligibility inquiry also resolves the reviewer's concern about the distinction between real rights and personal rights. That distinction is relevant to Law No. 42 of 1999 only after it is tied to the statutory object. If the debtor owns or controls a transferable digital asset that falls within Article 1(4), fiduciary security can be analyzed as a proprietary security right over that object. If the debtor instead holds only a contractual right against a platform or custodian, the object must be characterized as that receivable or claim, and the deed must describe the contractual right accordingly. The distinction therefore does not operate as a reason to exclude digital collateral; it determines what, precisely, is being encumbered and what enforcement can reach.³⁹

Transferability should also be assessed against third-party and regulatory constraints. A token may be technically transferable but legally restricted by sanctions, licensing rules, court orders, network rules, or contractual arrangements. Conversely, an asset may be legally transferable even though

³⁶ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

³⁷ Teguh Tresna Puja Asmara, Lastuti Abubakar, and Tri Handayani, "Digital Assets: The Idea of Indonesian Property Law Reform and Its Potential as a Collateral Object," *Hasanuddin Law Review* 5, no. 3 (2020): 278-88, <https://doi.org/10.20956/halrev.v5i3.1735>.

³⁸ Christiane Wendehorst, "Proprietary Rights in Digital Assets and the Conflict of Laws," in *Blockchain and Private International Law*, ed. Andrea Bonomi, Matthias Lehmann, and Shaheez Lalani (Leiden: Brill | Nijhoff, 2023), 101-27, https://doi.org/10.1163/9789004514850_007.

³⁹ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

transfer requires cooperation from a regulated custodian. The fiduciary analysis must account for both dimensions. “Control” is therefore not a free-standing substitute for ownership. It is an operational concept indicating who can cause or prevent disposition, while legal entitlement determines whose asset may validly be encumbered. A robust digital-collateral regime must make these two dimensions converge at creation and enforcement instead of assuming that possession of a credential settles the legal question.⁴⁰⁴¹

Constitutional Court Decision No. 18/PUU-XVII/2019 does not alter this eligibility analysis. The decision concerns the meaning and execution of the executory title under Article 15, particularly where default is disputed, and the debtor does not voluntarily surrender the collateral. It does not decide whether crypto assets are “objects” under Article 1, nor does it classify digital assets. Decision No. 2/PUU-XIX/2021 subsequently rejected a further challenge to this constitutional interpretation. The relevance of the Constitutional Court begins at the enforcement stage: once a digital asset has been validly made collateral, its liquidation must still respect the Court’s requirements concerning agreed or legally determined default and, where necessary, court-based execution.⁴²⁴³

The resulting legal position is narrower and more defensible than either extreme in the current debate. Indonesian law does not require an amendment merely to state that every digital asset is an “object,” because the existing statutory definition is already capable of covering transferable intangible assets. At the same time, the breadth of Article 1 cannot solve the practical requirements of a proprietary security right. Digital collateral is legally plausible only when the specific asset passes an eligibility test, and the security transaction can be made operational through specificity, publicity, priority, and lawful

⁴⁰ Thomas Keijser, “From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions,” *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

⁴¹ Dirk Zetsche and Areti Nikolakopoulou, “Crypto Custody: An Empirical Assessment,” *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

⁴² Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁴³ Constitutional Court of the Republic of Indonesia, Decision No. 2/PUU-XIX/2021, August 31, 2021, rejecting a further challenge concerning the execution of fiduciary security, <https://jdih.mkri.id/produk-hukum/putusan>.

enforcement. The analytical model in Figure 1 captures that sequence and becomes the basis for identifying the actual regulatory gaps.⁴⁴

Figure 1. Two-Stage Analytical Model for Digital Fiduciary Collateral

Asset classification	→	Eligibility	→	Specialty creation &	→	Publicity control &	→	Priority & enforcement
What right does the debtor hold?		Identifiable, valuable, transferable, encumberable		Digital-specific deed description		Fiduciary registration + operational notice/control		First registration + lawful execution

Source: Authors' legal reconstruction based on Law No. 42 of 1999 and the comparative materials analyzed in this article.

Operational Gaps: Specialty, Publicity, Priority, and Enforcement

Specialty is the first operational test after eligibility. Article 6 of Law No. 42 of 1999 requires the fiduciary deed to contain, among other matters, data concerning the parties, the underlying secured agreement, a description of the fiduciary object, the secured value, and the value of the object. For conventional collateral, description may rely on chassis numbers, registration documents, serial numbers, inventory categories, or receivable data. Digital collateral requires the same legal function, individualization, but different descriptors. The question is not whether a digital asset has a physical serial number; it is whether the deed provides objective information that allows the secured object to be distinguished from other assets without exposing credentials that would compromise security.⁴⁵

For a crypto asset, the minimum description should therefore be asset-specific and technology-neutral. Depending on the asset, the deed can identify the relevant blockchain or ledger, token or asset designation, smart-contract address where applicable, token identifier for a non-fungible

⁴⁴ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁴⁵ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

asset, quantity for a fungible asset, the debtor's relevant wallet or custody-account identifier, and a time-stamped reference to the state of the asset at creation. A cryptographic transaction hash or independent attestation may supplement that description when it improves traceability. The deed should not contain a private key, seed phrase, password, or similar secret. These are control credentials, not identifying characteristics of the legal object, and disclosing them would undermine the very asset the deed is intended to secure.⁴⁶

The dynamic character of blockchain systems does not make specialty impossible. A distinction must be drawn between a change in the location or control context of an asset and a change in the identity of the asset itself. An NFT can remain the same token even when transferred to another address. Fungible units can remain the same category of asset even though individual units are not economically distinguishable. The legal challenge is therefore analogous to, but more technologically demanding than, security over changing inventory or receivables: the law needs rules for description, replacement, proceeds, and tracing. Treating every movement between wallets as destruction of the collateral would make the security commercially useless; treating every subsequent token acquired by the debtor as automatically secured would be equally overbroad.⁴⁷

Current fiduciary legislation does not prescribe a digital-specific description standard. This creates two risks. An over-general deed may fail to provide meaningful specialty because it says only "crypto assets" or "digital assets." An over-technical deed may freeze the description around transient data, such as a single wallet address, and inadvertently exclude a validly substituted or custodied asset. The regulatory solution should therefore identify mandatory legal descriptors and permit supplementary technical identifiers that can be updated through a controlled mechanism without silently expanding the secured pool. The notarial deed remains the source document; technical records support, rather than replace, its legal description.⁴⁸

⁴⁶ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

⁴⁷ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁴⁸ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

Publicity is the second operational test. Articles 11 and 14 of Law No. 42 of 1999 make registration central to the creation and third-party effectiveness of fiduciary security: the security arises on the date it is recorded in the Fiduciary Register. The statutory system therefore relies on state registration, not mere contractual notice. That principle should be retained for digital collateral because it gives creditors and third parties a single public-law source for the existence and ranking of the security. The problem is not that blockchain is “more public” and should replace the registry. The problem is that registry publicity and factual ability to transfer the asset presently operate on separate infrastructures.⁴⁹

A debtor may validly grant and register fiduciary security over an eligible digital asset while still retaining unilateral technical ability to transfer the asset to another address. The registry may preserve the creditor’s legal claim, but a subsequent transferee, exchange, or custodian may not receive timely notice of the encumbrance. Conversely, an on-chain transfer is publicly observable but does not necessarily reveal the legal relationship behind the address or determine whether the transferee acquired free of a security interest. Blockchain transparency and legal publicity therefore solve different problems. Legal publicity identifies enforceable claims and priority; technical traceability shows movements in a ledger. Effective digital collateral requires an interface between them.^{50,51}

That interface should not be designed as a second competing registry. A more coherent model preserves the Fiduciary Register as the legally constitutive publicity mechanism while requiring an operational notice or control record at the point where disposition can occur. For assets held through a licensed custodian or trading intermediary, the registry entry can be linked to a notice recorded by that intermediary. For self-custodied assets, an agreed control arrangement, such as a segregated address, multi-signature structure, or other verifiable mechanism, can evidence the practical restriction on unilateral

⁴⁹ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁵⁰ Christiane Wendehorst, “Proprietary Rights in Digital Assets and the Conflict of Laws,” in *Blockchain and Private International Law*, ed. Andrea Bonomi, Matthias Lehmann, and Shaheez Lalani (Leiden: Brill | Nijhoff, 2023), 101-27, https://doi.org/10.1163/9789004514850_007.

⁵¹ Thomas Keijser, “From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions,” *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

transfer. The legal effect remains dependent on registration; the control layer reduces the gap between the public legal record and factual disposition.^{52,53}

Priority is the third test. Article 27 grants the fiduciary beneficiary preferential status, while Article 28 provides that where the same object is subject to more than one fiduciary security, priority belongs to the beneficiary whose security was first registered. This first-to-register logic remains conceptually suitable for digital assets because it is predictable and state-verifiable. The difficulty arises when the identity of the collateral changes, fungible units are commingled, the asset is moved across custody arrangements, or a transfer generates substitute assets or sale proceeds. Without rules connecting the original description to later traceable value, formal registration may not tell a court which digital units or proceeds remain subject to the security.⁵⁴

Fungibility should therefore be addressed expressly. A security over “2 BTC held in wallet X” presents different tracing problems from a security over a unique NFT. If the debtor commingles secured and unsecured fungible units in one address or account, a creditor may be able to prove the quantity originally encumbered but not the identity of specific units. A legal reconstruction should permit quantity-based identification where the asset itself is fungible, coupled with segregation or account-level records sufficient to establish the secured balance. This is preferable to importing a fiction that individual fungible tokens possess a persistent identity that the technology and market do not recognize.⁵⁵

Proceeds and substitution are equally important. Digital assets may be exchanged instantaneously for another crypto asset, fiat currency, a stable-value token, or a tokenized claim. Existing fiduciary concepts can address future or changing property in some contexts, but digital collateral requires a clearer rule

⁵² Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

⁵³ Dirk Zetzsche and Areti Nikolakopoulou, “Crypto Custody: An Empirical Assessment,” *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

⁵⁴ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁵⁵ Thomas Keijser, “From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions,” *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

defining when traceable proceeds remain subject to the original security and when a new deed or registration is required. The rule should be narrow enough to protect third parties from an invisible floating charge over all future digital property, while allowing the secured creditor to preserve value when a specifically encumbered asset is disposed of in a transaction authorized by the security agreement.^{56,57}

Insolvency exposes the practical importance of those rules. A curator or competing creditor needs to determine what property belongs to the debtor, what is held in custody for customers, what is subject to registered fiduciary security, and what proceeds can be traced. Crypto custody research shows that segregation and insolvency treatment vary significantly between service providers, making account documentation and custody architecture legally material. A fiduciary regime that records only a generic asset label without custody information may provide an apparently valid certificate but insufficient evidence to separate collateral from the debtor's other digital holdings during insolvency.⁵⁸

Enforcement is the fourth and most visible operational gap. Article 15 gives the fiduciary certificate executory force, while Article 29 provides recognized routes for execution. Those mechanisms were developed around property that can be delivered, seized, or sold through conventional procedures. Digital assets complicate each step because practical disposition may require a cryptographic signature or an instruction to a custodian. The fact that code can execute quickly does not eliminate legal requirements; it creates a risk that factual liquidation may precede legal determination of whether default has occurred and whether the creditor is entitled to enforce.⁵⁹

Constitutional Court Decision No. 18/PUU-XVII/2019 is therefore directly relevant to digital collateral, but only at this stage. The Court held, in substance, that where there is no agreement concerning default, and the debtor

⁵⁶ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁵⁷ Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

⁵⁸ Dirk Zetsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

⁵⁹ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

objects to voluntary surrender, execution must follow procedures comparable to enforcement of a final court judgment; default cannot be determined unilaterally by the creditor. A smart contract, exchange instruction, or automated liquidation threshold cannot be used to circumvent that constitutional requirement. If the triggering event is disputed, technological automation must yield to the legally required process. Decision No. 2/PUU-XIX/2021 did not displace this interpretation.⁶⁰

Self-custodied assets create a control problem because no regulated intermediary may be able to freeze or transfer the asset. A court order identifying the creditor's right may still be difficult to execute if the debtor alone controls the credential. The legal response should be *ex ante* rather than coercively demanding disclosure of a private key after default. At creation of the security, the parties should establish an enforceable control architecture proportionate to the transaction, for example, a multi-signature arrangement, qualified escrow, or another mechanism under which disposition requires the participation of an agreed third party or becomes available to the creditor only after legally valid enforcement conditions are satisfied. Such an arrangement must be recognized in implementing rules before it can serve reliably as part of fiduciary practice.⁶²

Custodied assets offer a more administrable path because a licensed intermediary can maintain account records, segregate assets, record the existence of an encumbrance, and execute a transfer or freeze when presented with a legally sufficient instruction. The current OJK framework creates regulated institutions and market infrastructure that could support these functions. It does not yet make those functions part of fiduciary perfection or execution. The reform opportunity is therefore institutional: instead of building an entirely new collateral bureaucracy, the Fiduciary Register can remain the legal publicity

⁶⁰ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁶¹ Constitutional Court of the Republic of Indonesia, Decision No. 2/PUU-XIX/2021, August 31, 2021, rejecting a further challenge concerning the execution of fiduciary security, <https://jdih.mkri.id/produk-hukum/putusan>.

⁶² Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

system while OJK-regulated custodial infrastructure supplies verified control, account segregation, and execution capability.⁶³⁶⁴

The transfer of crypto supervision into the OJK framework thus becomes relevant to fiduciary law for a concrete reason. It creates identifiable regulated gatekeepers through which notice, freezing, custody, and liquidation standards can be implemented. This does not mean OJK trading rules themselves establish fiduciary priority. The Ministry of Law's registration system and the rules of Law No. 42 of 1999 continue to determine creation and preference. Coordination is required because private-law and regulatory-law functions intersect at the same asset. Recent comparative scholarship on digital collateral similarly emphasizes that a workable legal framework must align proprietary, secured-transactions, and regulatory dimensions rather than treat them as separate silos.⁶⁵⁶⁶

Private keys should consequently be excluded from public registration and ordinary notarial annexes. A rule requiring the creditor to possess the debtor's private key would transform fiduciary security into de facto transfer of control, increase theft and cybersecurity risk, and potentially eliminate the debtor's continuing economic use of the collateral. The function of security law is not to maximize creditor control at all costs, but to create a legally ranked claim with predictable enforcement. Control mechanisms should be designed around

⁶³ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

⁶⁴ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

⁶⁵ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

⁶⁶ Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

restricted disposition, verifiable co-control, or regulated custody, with secret credentials protected according to technical and regulatory security standards.⁶⁷

For the same reason, automatic liquidation should not be treated as the legal equivalent of fiduciary execution merely because it is technically possible. Automated collateral management can be commercially useful where objective conditions are agreed and uncontested, but the constitutional interpretation of Article 15 requires legal space for dispute about default. A compliant system may use automated monitoring and pre-agreed alerts, yet final transfer or liquidation must be capable of suspension where the legally relevant default is contested. The technology should implement the legal allocation of authority, not silently redefine it.^{68,69}

Table 1. Analytical Synthesis of Current-Law Gaps

Legal element	Existing rule	Digital-asset gap	Required reconstruction
Specialty	Article 6: the fiduciary object must be described in the deed.	Wallets, token standards and custody structures lack a statutory description standard.	Mandatory digital-collateral schedule; no private-key disclosure.
Publicity	Articles 11 and 14: fiduciary security arises through registration.	Registry notice is not connected to the infrastructure through which the asset can be transferred.	Keep one legal registry; add custodian notice or verifiable control layer.
Priority	Articles 27-28: preference and first-registration priority.	Fungibility, commingling, substitution and proceeds can obscure the secured asset.	Quantity/balance rules, segregation, traceable proceeds and update rules.
Enforcement	Articles 15 and 29, subject to Constitutional Court Decision No. 18/PUU-XVII/2019.	Self-custody may block access; automation can pre-empt due process.	Ex ante control architecture, regulated custodian cooperation, dispute-sensitive execution.

⁶⁷ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

⁶⁸ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁶⁹ Timothy Chan and Kelvin F. K. Low, "DeFi Common Sense: Crypto-Backed Lending in *Janesh s/o Rajkumar v Unknown Person* ('CHEFPIERRE')," *The Modern Law Review* 86, no. 5 (2023): 1278-93, <https://doi.org/10.1111/1468-2230.12804>.

Source: Authors' analysis of Law No. 42 of 1999 and Constitutional Court Decision No. 18/PUU-XVII/2019.⁷⁰⁷¹

The synthesis is therefore straightforward. The existing regime contains the doctrinal elements necessary for digital collateral but lacks standards connecting each legal element to digital infrastructure. Specialty needs digital-specific identifiers without disclosure of credentials; publicity needs registration plus an operational notice or control interface; priority needs rules for fungible balances, proceeds, and substitution; and enforcement needs ex ante control arrangements and custodian cooperation that remain subject to constitutional due process. Table 1 summarizes these gaps. They are sufficiently specific to support targeted reconstruction, rather than a wholesale replacement of fiduciary law.⁷²

This diagnosis also narrows the comparative inquiry. Foreign systems are useful only to the extent that they demonstrate techniques for solving the same functional problems. Singapore is relevant because *Janesh* shows how a court can recognize a digital token as property and preserve it through a proprietary injunction. The United States is relevant because the 2022 UCC amendments build control-based rules for defined electronic records within secured-transactions law. Neither system should be copied wholesale. Their value lies in demonstrating that legal recognition, control, publicity, priority, and enforcement can be separated analytically and then reconnected through explicit rules.⁷³⁷⁴

⁷⁰ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁷¹ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁷² Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁷³ *Janesh s/o Rajkumar v Unknown Person ("CHEFPIERRE")* [2022] SGHC 264; Singapore Judiciary, "Janesh s/o Rajkumar v Unknown Person," case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

⁷⁴ Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

Comparative Lessons and Legal Reconstruction

A functional comparison begins with the legal problem rather than the foreign label used for the asset. Indonesia needs rules that permit a creditor to identify eligible digital collateral, obtain third-party effectiveness, preserve priority, and execute lawfully. Singapore and the United States illustrate different institutional routes toward those objectives. Singapore demonstrates common-law adaptability in recognizing a new digital object within existing property concepts. The UCC amendments demonstrate legislative adaptation of secured-transactions rules to electronic assets by defining categories and control standards. The comparison therefore helps separate what must be decided by Indonesian property legislation from what can be supplied by evidentiary, registration, and regulatory mechanisms.⁷⁵⁷⁶

In *Janesh s/o Rajkumar v Unknown Person* (“CHEFPIERRE”), the Singapore High Court granted a proprietary injunction over a Bored Ape Yacht Club NFT that had been used as collateral in a crypto-backed loan. The court treated NFTs as capable of giving rise to proprietary rights and applied familiar indicia of property, including definability, identification by third parties, transferability, and a degree of permanence or stability. The decision is important because it shows that the absence of physical form is not a categorical barrier to proprietary protection when a digital asset can be identified and controlled within a stable system.⁷⁷

Janesh nonetheless has limits for Indonesian fiduciary reform. It was an injunction case, not a comprehensive statutory regime for perfection and priority of security interests. Recognition of an NFT as property did not itself create a public registration system, determine the ranking of multiple secured creditors, or establish a general execution procedure for all digital assets. The proper lesson is therefore methodological: property concepts can be applied to

⁷⁵ *Janesh s/o Rajkumar v Unknown Person* (“CHEFPIERRE”) [2022] SGHC 264; Singapore Judiciary, “Janesh s/o Rajkumar v Unknown Person,” case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

⁷⁶ Uniform Law Commission, “UCC, 2022 Amendments to,” describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

⁷⁷ *Janesh s/o Rajkumar v Unknown Person* (“CHEFPIERRE”) [2022] SGHC 264; Singapore Judiciary, “Janesh s/o Rajkumar v Unknown Person,” case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

digital assets through functional criteria, but secured-transactions consequences require additional rules. This distinction supports the two-stage model proposed here and avoids overstating foreign jurisprudence.⁷⁸⁷⁹

Chan and Low's analysis of Janesh further demonstrates why code-based lending should not be equated with a complete legal security regime. DeFi arrangements may embed automatic or semi-automatic contractual mechanisms, but the legal effectiveness of those mechanisms depends on background rules concerning property, remedies, and the parties' rights. For Indonesia, the implication is that smart-contract functionality may support monitoring or control, yet the juridical source of fiduciary priority must remain statutory registration. Technology can reduce operational friction but cannot independently create the *erga omnes* ranking that civil-law security rights require.⁸⁰

The United States comparison addresses a different part of the problem. The 2022 amendments to the Uniform Commercial Code add Article 12 for certain digital assets defined as Controllable Electronic Records and make corresponding amendments across the UCC, including Article 9 on secured transactions. The reform is intentionally technology-neutral: rather than naming specific cryptocurrencies, it uses functional concepts capable of applying to electronic records where control can be established. This avoids tying the statute to a particular blockchain or token standard and demonstrates how a mature secured-transactions system can adapt without abandoning its existing architecture.⁸¹

The most useful UCC lesson is the legal use of "control." Control is not treated as a mystical equivalent of ownership; it is a defined mechanism that supports transfer and, in the secured-transactions context, perfection and priority for specified categories of digital collateral. That approach is compatible with the central problem identified in Indonesia, but the institutional

⁷⁸ Janesh s/o Rajkumar v Unknown Person ("CHEFPIERRE") [2022] SGHC 264; Singapore Judiciary, "Janesh s/o Rajkumar v Unknown Person," case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

⁷⁹ Timothy Chan and Kelvin F. K. Low, "DeFi Common Sense: Crypto-Backed Lending in Janesh s/o Rajkumar v Unknown Person ('CHEFPIERRE')," *The Modern Law Review* 86, no. 5 (2023): 1278-93, <https://doi.org/10.1111/1468-2230.12804>.

⁸⁰ Timothy Chan and Kelvin F. K. Low, "DeFi Common Sense: Crypto-Backed Lending in Janesh s/o Rajkumar v Unknown Person ('CHEFPIERRE')," *The Modern Law Review* 86, no. 5 (2023): 1278-93, <https://doi.org/10.1111/1468-2230.12804>.

⁸¹ Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

translation must differ. Indonesia already has a constitutive fiduciary registration system. It should therefore use control as a supplementary requirement or evidentiary mechanism for selected digital assets, not replace registration with possession of a private key or a purely technological event.⁸²

The UCC model also demonstrates the value of separating the asset category from the technical method. A statute need not mention Bitcoin, Ether, a particular token standard, or a named blockchain. It can define an eligible electronic asset through legal characteristics, identifiability, transferability, and the ability of a person to exercise or evidence control, and then permit technical standards to evolve in subordinate regulation. For Indonesia, this is preferable to inserting a static catalogue of crypto products into Law No. 42 of 1999, because OJK-regulated markets and technologies will continue to change faster than primary legislation.^{83,84}

Recent comparative scholarship on collateral transactions involving digital assets reinforces this functional approach. Keijser argues that legal frameworks for digital collateral should remain aligned with established principles of collateral law while also incorporating regulatory considerations and lessons from financial-market instability. This insight is particularly relevant to Indonesia because fiduciary security and OJK supervision would operate over the same asset from different legal perspectives. A digital-collateral framework that ignores custody regulation, consumer protection, and market infrastructure would be formally coherent but operationally incomplete; a regulatory framework that ignores proprietary priority would be equally incomplete.⁸⁵

Table 2 compares the three systems only on those functional dimensions. The comparison confirms that Indonesia's principal weakness is not the absence

⁸² Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

⁸³ Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

⁸⁴ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

⁸⁵ Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

of any legal recognition of digital assets. It is the absence of a bridge from asset recognition to secured-transactions operability. Singapore supplies a useful judicial test for proprietary character; the UCC supplies a model for technology-neutral control; Indonesia supplies a constitutive registration and preference structure that should be retained. A coherent reconstruction can combine the functions without copying the foreign institutions.⁸⁶⁸⁷

Proposed Legal Reconstruction for Indonesia

Table 2. Functional Comparison of Digital Collateral Approaches

Dimension	Indonesia (current)	Singapore (Janesh)	United States (2022 UCC)	Lesson for Indonesia
Asset recognition	Broad statutory concept of intangible fiduciary objects; crypto regulated in financial-sector law.	NFT capable of proprietary protection under common-law criteria.	Article 12 creates category of controllable electronic records.	Use technology-neutral eligibility criteria.
Publicity / perfection	Fiduciary registration is constitutive; no digital-control interface.	Janesh did not create a general secured-transactions registry.	Article 9 amendments use filing/control rules for relevant digital collateral.	Retain registration, add operational control/notice.
Priority	First registered fiduciary right has priority under Article 28.	Not comprehensively determined by Janesh.	Control and Article 9 priority rules address specified conflicts.	Clarify fungibility, proceeds, substitution and custodial conflicts.
Enforcement	Executory title subject to Constitutional Court due process.	Proprietary injunction preserved NFT pending adjudication.	Secured-transactions remedies operate within statutory framework.	Technology must implement, not bypass, lawful enforcement.

⁸⁶ Janesh s/o Rajkumar v Unknown Person (“CHEFPIERRE”) [2022] SGHC 264; Singapore Judiciary, “Janesh s/o Rajkumar v Unknown Person,” case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

⁸⁷ Uniform Law Commission, “UCC, 2022 Amendments to,” describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

Sources: Janesh; Uniform Law Commission 2022 UCC amendments; Indonesian legislation analysed above.⁸⁸⁸⁹⁹⁰

The proposed reconstruction begins with one design principle: separate the legal creation of the fiduciary right from the technological means used to make that right effective in practice. The Ministry of Law's Fiduciary Register should remain the constitutive source of publicity and priority. OJK-regulated infrastructure, custody records, cryptographic attestations, and agreed control arrangements should serve as operational interfaces. This allocation preserves the civil-law requirement that third-party effects arise from law and public registration while acknowledging that digital assets can be moved or frozen only through systems that the 1999 statute did not anticipate.⁹¹⁹²

First, legislation or implementing regulation should clarify the category of "digital asset eligible for fiduciary security" in technology-neutral terms. The rule should not declare every digital asset collateral. It should state that an intangible digital asset or digital right may be a fiduciary object only where it is identifiable, economically valuable, legally transferable, and subject to an entitlement or control that the grantor may validly encumber. The qualification should expressly preserve restrictions arising from financial-sector regulation, intellectual-property law, contractual non-transferability, sanctions, and other

⁸⁸ Janesh s/o Rajkumar v Unknown Person ("CHEFPIERRE") [2022] SGHC 264; Singapore Judiciary, "Janesh s/o Rajkumar v Unknown Person," case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

⁸⁹ Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

⁹⁰ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁹¹ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁹² Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

mandatory rules. This formulation gives effect to the breadth of Article 1(4) without expanding property law through mere nomenclature.^{93,94}

Second, the eligibility rule should distinguish the object from the means of control. A proposed provision could state that cryptographic credentials, passwords, seed phrases, or equivalent authentication data are not themselves fiduciary objects merely because they enable disposition. Their custody may be regulated as part of the control arrangement, but they should not be published in the deed or register. This would correct a common conceptual error and reduce security risks. The asset description should instead focus on legally and technically verifiable identifiers while allowing confidential control data to remain within a secure custody or multi-party control environment.⁹⁵

Third, specialty should be implemented through a digital-collateral schedule attached to the notarial deed. The schedule should contain mandatory fields appropriate to the asset class: network or ledger, asset or token designation, contract address and token identifier where applicable, quantity for fungible assets, wallet or custody-account reference, valuation basis, and any agreed rule concerning proceeds or substitution. Technical fields that may change should be updateable through a documented and auditable procedure, but a change that materially enlarges the collateral pool should require a new or amended deed and registration. This structure translates Article 6 into a digital context without abandoning authentic-deed formalities.⁹⁶

Fourth, publicity should adopt a coordinated but single-legal-registry model. Registration in the Fiduciary Register should remain the event that creates the security right and establishes legal priority. For designated digital

⁹³ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁹⁴ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

⁹⁵ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

⁹⁶ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

assets, the registration process should also generate a standardised notice that can be recorded by a licensed custodian, exchange, or other authorised intermediary. The intermediary's record would not create the security; it would make the registered encumbrance operational at the point of transfer. Where the asset is self-custodied, the register should record the existence and type of an approved control arrangement without publishing secret credentials. This avoids both registry fragmentation and a purely symbolic registration disconnected from technical reality.⁹⁷⁹⁸

Fifth, control should be defined functionally and proportionately. For a custodied asset, control may consist of an intermediary's verified ability to prevent unauthorised transfer and to act on a legally sufficient enforcement instruction. For a self-custodied asset, control may be evidenced through a segregated address, multi-signature arrangement, escrow, or comparable mechanism under which the debtor cannot unilaterally defeat the security without leaving verifiable evidence or obtaining the participation of an agreed party. The precise technical standards should be delegated to periodically updatable regulation or guidance, because cryptographic systems evolve. The statute should specify the legal function rather than freeze one technical solution.⁹⁹¹⁰⁰

Sixth, priority should remain anchored in Article 28's first-registration principle but be supplemented by rules for digital-specific conflicts. A registered fiduciary creditor should retain priority in the described asset subject to statutory exceptions. For fungible assets held in a segregated account or address, priority can attach to the registered quantity or balance. Where authorised disposition produces traceable proceeds, the regulation should specify a limited continuation period or a clear condition under which the security follows the

⁹⁷ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

⁹⁸ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

⁹⁹ Uniform Law Commission, "UCC, 2022 Amendments to," describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

¹⁰⁰ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

proceeds. A purchaser or intermediary acting in circumstances specified by law may require protection to preserve market finality. These issues should be resolved expressly rather than left to inference from blockchain chronology, because the earliest on-chain transaction is not necessarily the legally first secured claim.¹⁰¹¹⁰²

Seventh, the treatment of proceeds and substitution should balance creditor protection with third-party certainty. The security agreement may authorise trading or replacement of collateral within defined parameters, but such authority should not create an unlimited security interest over all digital property acquired later. A workable rule would preserve the security in specifically identifiable or traceable proceeds for a defined period and require an updated registry description when the asset category or custody arrangement materially changes. This approach is consistent with the function of specialty: the creditor may protect value without converting a registered security over one digital asset into an invisible floating encumbrance over the debtor's entire digital portfolio.¹⁰³

Eighth, insolvency rules should require evidentiary alignment between the fiduciary register, the debtor's records, and custodian or wallet data. The secured creditor should be able to present the registration, digital-collateral schedule, control record, and transaction history as a coherent evidentiary chain. Licensed custodians should maintain segregation and account records sufficient to determine customer entitlements and registered encumbrances. This recommendation does not predetermine all insolvency-property questions; it ensures that a curator has reliable material for resolving them. Without such alignment, formal priority can become practically unenforceable because the collateral cannot be distinguished from the debtor's other holdings.¹⁰⁴

Ninth, enforcement must be reconstructed around the Constitutional Court's due-process requirements. The security agreement should define

¹⁰¹ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹⁰² Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

¹⁰³ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹⁰⁴ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

objective default events as precisely as commercial practice permits, but a creditor should not be able to make a contested default legally conclusive by unilateral declaration or by programming an irreversible liquidation. Where default and surrender are agreed or undisputed, a custodian or control arrangement may facilitate prompt execution in accordance with Article 29. Where default is disputed, and the debtor resists surrender, the process must permit the court-based route required by Decision No. 18/PUU-XVII/2019. Digital speed cannot justify a lower level of procedural protection than physical collateral.¹⁰⁵¹⁰⁶

Tenth, licensed custodians and trading intermediaries should have clearly defined duties when they receive notice of a registered fiduciary security. Those duties may include recording the encumbrance, preventing transfers inconsistent with the registered restriction where legally required, preserving relevant transaction records, and executing a freeze or transfer only upon an instruction that satisfies the applicable legal standard. The details should be coordinated between fiduciary-registration rules and OJK regulation. This is more realistic than requiring courts or registration officials to manage private keys and more legally accountable than leaving enforcement entirely to private platform terms.¹⁰⁷¹⁰⁸

Eleventh, self-custody should not be prohibited merely because it is harder to enforce, but transactions relying on self-custody should meet a higher operational threshold. A creditor that accepts a purely unilateral debtor-controlled wallet without any enforceable co-control or escrow mechanism knowingly accepts a severe execution risk. Implementing rules could therefore require disclosure of the chosen control architecture and permit

¹⁰⁵ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹⁰⁶ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹⁰⁷ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

¹⁰⁸ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

registration of self-custodied digital collateral only where the arrangement provides a legally verifiable path to preservation and execution. This converts a technical weakness into an *ex-ante* transaction-design requirement rather than an impossible *ex post* demand for the debtor's secret credential.¹⁰⁹

Twelfth, valuation and liquidation standards should address volatility and market integrity. The deed should state a valuation methodology or reference source and may provide for periodic margining where commercially appropriate. Enforcement sales should ordinarily use a regulated or otherwise legally permitted market mechanism capable of producing an auditable price and transaction record. A private transfer to the creditor should be permitted only within the statutory execution framework and with safeguards against opportunistic undervaluation. The purpose is not to import derivatives regulation into every loan, but to ensure that highly volatile collateral does not undermine the debtor-protection and surplus-return principles that ordinarily accompany security enforcement.¹¹⁰¹¹¹

Thirteenth, electronic and cryptographic records should be treated as evidence supporting established legal categories, not as an autonomous species of proof that displaces procedural law. Transaction hashes, signed messages, custody statements, time-stamped logs, and wallet attestations can help establish identity, control, transfer, and valuation. Their evidentiary weight should depend on authenticity, integrity, and relevance. Where specialized interpretation is necessary, expert evidence may be used. This approach is preferable to declaring "blockchain evidence" inherently conclusive, because immutable recording of a transaction does not prove every legal fact surrounding authority, consent, mistake, fraud, or ownership.

Fourteenth, cross-border issues should be anticipated even if a comprehensive conflict-of-laws reform falls outside the scope of this article. A digital asset may be recorded on a borderless network, held through a foreign custodian, traded on an offshore platform, and encumbered by an Indonesian

¹⁰⁹ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73-97, <https://doi.org/10.1093/jfr/fjaf004>.

¹¹⁰ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

¹¹¹ Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143-51, <https://doi.org/10.1093/ulr/unaf031>.

debtor. The fiduciary deed should therefore disclose the relevant custodian and governing account arrangements, while future legislation should identify connecting factors for proprietary questions. Comparative scholarship on digital assets shows that location-based rules can become unstable where no physical situs exists. Until a broader conflicts framework is enacted, Indonesian fiduciary law should at minimum avoid assuming that a domestic registry entry can compel a foreign intermediary without jurisdictional or contractual support.¹¹²

The proposed rules are intentionally incremental. They do not transform the Fiduciary Register into a blockchain, create a new species of property right, or make code superior to judicial process. They use the existing fiduciary structure, eligible object, authentic deed, registration, preference, priority, and execution, and add standards at the points where digital assets create a demonstrable mismatch. Table 3 translates the reconstruction into sample norm formulations. These formulations are legislative proposals, not statements of current law, and are designed to show the level of specificity required if reform is to move beyond general recommendations.¹¹³

Table 3. Illustrative Norm Formulations for Indonesian Digital Fiduciary Collateral

Proposed provision	Illustrative norm formulation	Function
Eligibility of digital assets	“A digital asset may constitute a Fiduciary Object insofar as it is identifiable, economically valuable, legally transferable, and subject to an entitlement or control that the Fiduciary Grantor is legally authorized to encumber.”	Connect Article 1(4) to a technology-neutral eligibility test.
Identification and publicity	“The deed and registration of digital collateral shall state the legally sufficient asset identifiers prescribed by regulation. Secret authentication credentials shall not be published. Registration remains constitutive; where the asset is held by a licensed intermediary, notice of the registered encumbrance shall be recorded in the relevant custody or control system.”	Preserve state publicity while linking it to the transfer infrastructure.

¹¹² Christiane Wendehorst, “Proprietary Rights in Digital Assets and the Conflict of Laws,” in *Blockchain and Private International Law*, ed. Andrea Bonomi, Matthias Lehmann, and Shaheez Lalani (Leiden: Brill | Nijhoff, 2023), 101-27, https://doi.org/10.1163/9789004514850_007.

¹¹³ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

Proposed provision	Illustrative norm formulation	Function
Priority and proceeds	“Priority is determined by the time of fiduciary registration. For fungible digital collateral and authorized substitutions, implementing regulations shall prescribe segregation, balance identification, and the conditions under which a security right continues in traceable proceeds.”	Adapt Article 28 without replacing first-registration priority.
Enforcement	“A custodian or control agent may freeze, transfer, or liquidate registered digital collateral only on an instruction satisfying the fiduciary deed and applicable law. Where default is disputed, execution shall comply with the constitutional interpretation of Article 15.”	Make digital execution technically feasible and procedurally lawful.

Note: These formulations are normative proposals of the authors and do not reproduce current statutory text.

Conclusion

First, the legal status of digital collateral should be framed as an eligibility question, not as a binary debate about whether all digital assets are “property.” Law No. 42 of 1999 already contains a broad definition capable of including transferable intangible assets. The current P2SK and OJK frameworks further establish that digital financial assets and crypto assets operate within a recognized regulatory environment. Neither proposition means that every token, account, license, or data set can become fiduciary collateral. Eligibility depends on identification, economic value, the debtor’s legally cognizable entitlement or control, transferability, and the absence of mandatory or contractual restrictions. This classification must precede the creation of the security right.¹¹⁴¹¹⁵¹¹⁶

¹¹⁴ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹¹⁵ Republic of Indonesia, Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2023 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 6845, as amended by Undang-Undang Nomor 4 Tahun 2026 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan, Lembaran Negara Republik Indonesia Tahun 2026 Nomor 62, Tambahan Lembaran Negara Republik Indonesia Nomor 7180, <https://peraturan.bpk.go.id/Details/240203/uu-no-4-tahun-2023> and <https://peraturan.bpk.go.id/Details/350166/uu-no-4-tahun-2026>.

¹¹⁶ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and

Second, the principal deficiency of the current regime is operational. Article 6 can support digital specialty, but no binding standard specifies how crypto collateral should be described. Articles 11 and 14 create legal publicity through registration, but the register is not connected to the systems through which digital assets are transferred. Articles 27 and 28 provide preference and first-registration priority, but the law lacks digital-specific rules for fungible balances, commingling, proceeds, and substitution. Article 15 and Article 29 provide execution mechanisms, but self-custody and intermediary-based custody require a practical route to freeze or transfer the asset. These gaps explain why formal recognition alone cannot produce a reliable digital security interest.¹¹⁷

Third, Constitutional Court Decision No. 18/PUU-XVII/2019 affects the enforcement of digital collateral but not its initial status as a fiduciary object. The decision prevents a creditor from treating disputed default as conclusively established by unilateral determination and requires court-based execution where the statutory conditions identified by the Court are present. That principle applies with particular force to automated digital collateral. A smart contract or exchange rule may monitor agreed thresholds, but it cannot be designed to erase the debtor's constitutional entitlement to challenge a disputed default. Decision No. 2/PUU-XIX/2021 leaves this interpretive framework intact.^{118,119}

Fourth, comparison with Singapore and the 2022 UCC amendments supports a technology-neutral reconstruction rather than wholesale legal transplantation. Janesh demonstrates that a digital token can satisfy conventional indicia of property and be preserved by proprietary remedies. The UCC demonstrates that control can be defined as a legal function within a modern secured-transactions regime. Indonesia should retain its own

<https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

¹¹⁷ Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹¹⁸ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹¹⁹ Constitutional Court of the Republic of Indonesia, Decision No. 2/PUU-XIX/2021, August 31, 2021, rejecting a further challenge concerning the execution of fiduciary security, <https://jdih.mkri.id/produk-hukum/putusan>.

constitutive fiduciary registration and use these lessons only to refine eligibility, identification, control, and enforcement. The comparative exercise therefore reinforces, rather than displaces, the internal logic of Indonesian property security.¹²⁰¹²¹

Fifth, the proposed reconstruction is a two-stage model. Asset eligibility is determined first. Security operability then requires a digital-specific deed schedule, state registration, and an operational control or notices layer appropriate to custody or self-custody. Priority should remain anchored in first registration while rules are added for fungibility, proceeds, and substitution. Enforcement should be designed *ex ante* through regulated custodian cooperation or legally recognized control arrangements and must remain consistent with Constitutional Court due process. This model gives the Fiduciary Register legal primacy while making the security technically capable of preservation and execution.¹²²¹²³¹²⁴

The novel contribution of this article is therefore to relocate the reform debate from the abstract expansion of “objects” to the legal interface between recognition and operability. Indonesia does not need to treat blockchain as a substitute for property law. It needs rules that translate the existing functions of specialty, publicity, priority, and enforcement into the digital environment. Such reform would provide greater certainty to creditors without granting them unilateral technological dominance, preserve debtor protection, and create a legally auditable path for digital collateral within the regulated financial system.

¹²⁰ Janesh s/o Rajkumar v Unknown Person (“CHEFPIERRE”) [2022] SGHC 264; Singapore Judiciary, “Janesh s/o Rajkumar v Unknown Person,” case brief, <https://www.judiciary.gov.sg/judgments/case-briefs-by-smu/janesh-s-o-rajkumar-v-unknown-person>.

¹²¹ Uniform Law Commission, “UCC, 2022 Amendments to,” describing the addition of Article 12 on Controllable Electronic Records and corresponding amendments to Article 9 for secured transactions in digital assets, <https://www.uniformlaws.org/acts/ucc>.

¹²² Republic of Indonesia, Undang-Undang Nomor 42 Tahun 1999 tentang Jaminan Fidusia, Lembaran Negara Republik Indonesia Tahun 1999 Nomor 168, Tambahan Lembaran Negara Republik Indonesia Nomor 3889, especially arts. 1(2), 1(4), 5-6, 11, 14, 15, 27-29, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

¹²³ Otoritas Jasa Keuangan, Peraturan Otoritas Jasa Keuangan Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto, effective January 10, 2025, as amended by Peraturan Otoritas Jasa Keuangan Nomor 23 Tahun 2025, effective November 10, 2025, <https://ojk.go.id/id/regulasi/Pages/POJK-27-2024-AKD-AK.aspx> and <https://ojk.go.id/id/regulasi/Pages/POJK-23-2025-Perubahan-POJK-27-Tahun-2024-tentang-Penyelenggaraan-Perdagangan-Aset-Kuangan-Digital-Termasuk-Aset-Kripto.aspx>.

¹²⁴ Constitutional Court of the Republic of Indonesia, Decision No. 18/PUU-XVII/2019, concerning judicial review of Law No. 42 of 1999 on Fiduciary Guarantees; see also the official summary reproduced in the JDIH BPK entry for Law No. 42 of 1999, <https://peraturan.bpk.go.id/Details/45374/uu-no-42-tahun-1999>.

Future research should test the proposed framework against insolvency, cross-border custody, tokenized securities, and empirical notarial or lending practice once digital collateral transactions become more common.¹²⁵¹²⁶

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¹²⁵ Thomas Keijser, "From Intermediated Securities to Digital Assets: The Debate on Collateral Transactions," *Uniform Law Review* 30, no. 2 (2025): 143–51, <https://doi.org/10.1093/ulr/unaf031>.

¹²⁶ Dirk Zetzsche and Areti Nikolakopoulou, "Crypto Custody: An Empirical Assessment," *Journal of Financial Regulation* 11, no. 1 (2025): 73–97, <https://doi.org/10.1093/jfr/fjaf004>.

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