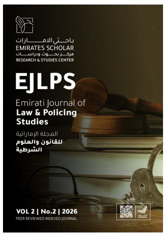

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Reaching Assets That Have No Place: A Comparative Policy Evaluation of Judicial Enforcement and Attachment over Virtual Assets and Digital Currencies

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ABSTRACT

Cryptocurrencies and other virtual assets have outgrown the civil-procedure rules meant to reach a debtor's property. A creditor who once needed a bank account number now faces value recorded on a distributed ledger, controlled by a private key, and movable across borders in seconds. This study evaluates whether existing legal frameworks can support effective judicial enforcement and attachment (al-ḥajz) over such assets, and what an optimal framework would look like, with particular attention to the United Arab Emirates. Methodologically, it is a comparative policy-evaluation study built on doctrinal analysis: it constructs an Enforceability Evaluation Framework that scores four jurisdictions – the UAE, the European Union, the United Kingdom, and the United States – across five enforcement functions (legal-nature recognition, custodial attachment, execution mechanisms, cross-border jurisdiction, and regulator-court cooperation), using a transparent coding rubric applied to primary legal instruments and reported case law. Four research propositions are then evaluated against that coding. The analysis finds that substantive recognition of crypto-assets as property is now broadly settled, yet procedural enforcement remains fragmented; that enforcement effectiveness is governed primarily by custodial reachability and regulator-court integration rather than by property characterisation; and that the UAE's mature licensing architecture positions it to achieve effective enforcement through targeted procedural reform rather than wholesale recodification. The study proposes a five-component procedural framework and maps its contribution to UN Sustainable Development Goals 8, 9, 16, and 17. The work contributes an original evaluative instrument and a reform blueprint for Arab civil-procedure systems navigating a regulated digital economy.

Keywords: *virtual assets; digital currencies; judicial enforcement; attachment (al-ḥajz); cryptocurrency;*

Introduction

Enforcement is where law meets reality. A judgment that cannot be executed is, for the creditor who holds it, little more than an expensive piece of paper. For most of the modern history of civil procedure, the machinery of execution rested on a comfortable assumption: that a debtor's wealth sits somewhere a court can reach – in land, in goods, in a bank account held by an institution that will obey a freezing order. Cryptocurrencies broke that assumption quietly and then all at once.

Consider the position of a judgment creditor today. The debtor's wealth may exist only as an entry on a blockchain, controlled by a string of characters that the debtor alone knows, held in no bank and registered in no jurisdiction. It can be moved to the other side of the world before the ink on the judgment is dry, and split across a dozen wallets that bear no name. The tools a court reaches for – attachment, garnishment, seizure – were designed for a world of tangible movables and intermediated funds. They do not obviously fit an asset that is neither tangible nor intermediated, and that may resist the very notion of a fixed location.

The United Arab Emirates has met the rise of virtual assets with unusual regulatory ambition. Its framework is layered: the Securities and Commodities Authority (SCA) and the Central Bank of the UAE (CBUAE) hold onshore competence, while Dubai's Virtual Assets Regulatory Authority (VARA), the Abu Dhabi Global Market (ADGM), and the Dubai International Financial Centre (DIFC) operate their own regimes within defined zones (Khairallah Advocates, 2025; NEOS Legal, 2026). The enactment of Federal Decree-Law No. 6 of 2025 drew virtual-asset payment activity firmly under federal oversight, marking a deliberate move from a patchwork toward a consolidated national approach (Levush, 2026; Databird Business Journal, 2025).

But regulating a market is not the same as enforcing a judgment against the value held within it. Licensing tells a service provider how to behave; it does not tell a judge how to attach a self-custodied wallet, how to compel an exchange to freeze a balance, or whether a UAE court may assert authority over tokens recorded on a borderless ledger. That space – between the regulation of virtual assets and the judicial enforcement against them – is where this study works.

Problem Statement

The problem this paper addresses is whether the legislative and procedural frameworks now in force are adequate to enforce judgments and effect attachment over virtual assets and digital currencies, and, if they are not, what an optimal framework would require. The question is pressing in the UAE specifically, where a sophisticated regulatory regime coexists with a civil-procedure code that, like its regional peers, was not written with on-chain assets in mind.

Research Questions and Propositions

The study pursues one principal question – are existing frameworks adequate for enforcement against virtual assets, and what is the optimal framework? – through five sub-questions concerning the legal nature of these assets, the feasibility of attachment, appropriate execution mechanisms, the determination of cross-border jurisdiction, and the role of financial regulators.

Because this is a policy-evaluation study rather than an empirical one, it advances four research propositions, each evaluated against the comparative analysis in Sections 5 and 6:

P1. Substantive recognition of crypto-assets as property is broadly settled across mature jurisdictions and is no longer the binding constraint on enforcement.

P2. Enforcement effectiveness is determined primarily by custodial reachability and regulator-court integration, not by the precise private-law classification of the asset.

P3. Tightening market regulation improves enforcement against intermediated holdings while leaving self-custodied holdings largely beyond practical reach – an asymmetry that regulation alone cannot resolve.

P4. Jurisdictions with mature virtual-asset licensing regimes – the UAE among them – can achieve effective enforcement principally through targeted procedural reform rather than wholesale recodification of substantive law.

Contribution

The paper makes three contributions. First, it develops an original Enforceability Evaluation Framework: a transparent, function-based instrument for assessing how effectively a legal system can enforce against virtual assets, applicable beyond the four systems examined here. Second, it offers the first structured comparative evaluation of this kind oriented toward Arab civil-procedure systems, addressing a gap in Arabic-language legal scholarship noted in the originating research proposal. Third, it translates the evaluation into a concrete, five-component procedural reform blueprint and aligns that blueprint with the UN Sustainable Development Goals.

Literature Review

Scholarly and judicial attention to crypto-assets has run along two tracks that rarely meet. One asks whether crypto-assets are property at all; the other asks how a market in them should be regulated. Comparatively little work sits at their intersection – the procedural question of how a court actually reaches an on-chain asset to satisfy a judgment. This review traces all three strands and locates the present study in the third.

The Property Status of Crypto-Assets

English law has produced the deepest seam of authority on whether crypto-assets are property. The turning point was AA v Persons Unknown [2019] EWHC 3556 (Comm), where the Commercial Court granted a proprietary injunction over Bitcoin paid as a ransom. Bryan J confronted the awkward fact that a crypto-asset is neither a thing in possession (it is intangible) nor a thing in action (it is not a claim), and concluded nonetheless that it could be property (Howard Kennedy, 2020; Proskauer, 2022). The reasoning drew on the UK Jurisdiction Taskforce's 2019 Legal Statement, which had argued that crypto-assets should in principle be treated as property.

The position hardened over the following years. In Osbourne v Persons Unknown [2022] EWHC 1021 (Comm) the court extended comparable protection to non-fungible tokens, and in Tulip Trading v Van der Laan [2023] EWCA Civ 83 the Court of Appeal proceeded on the footing that Bitcoin was property (Clyde & Co, 2025). The line reached its most authoritative statement in D'Aloia v Persons Unknown [2024] EWHC 2342 (Ch) – the first English decision, after a full trial, to confirm that a cryptocurrency (the stablecoin USDT) can attract property rights and be traced into a mixed

fund (Lewis Silkin, 2024; Henderson Chambers, 2024).

Statute then caught up with the case law. The Law Commission of England and Wales, in its Digital Assets: Final Report (Law Com No 412, 2023) and a 2024 supplemental report with a draft Bill, recommended recognising a distinct "third category" of personal property capable of accommodating digital assets (Law Commission, 2024; BCLP, 2024). That recommendation became law in the Property (Digital Assets etc) Act 2025, which received Royal Assent and confirmed the third category, giving owners enforceable proprietary rights against misuse and theft (Clyde & Co, 2025).

Other systems arrived at similar destinations by different roads. In the United States, courts have generally treated cryptocurrency as property, and the 2022 amendments to the Uniform Commercial Code introduced a new Article 12 governing "controllable electronic records," now being adopted state by state. The convergence is striking: across common-law and civil-law systems alike, the once-vexed question "is it property?" has been answered yes.

Regulation as Indirect Enforcement Infrastructure

A second body of work treats market regulation as enforcement infrastructure in disguise. The European Union's Regulation (EU) 2023/1114 on Markets in Crypto-Assets (MiCA) created the first comprehensive, harmonised regime for crypto-assets and their service providers. It entered into force on 29 June 2023; rules for asset-referenced and e-money tokens applied from 30 June 2024, and the full framework for crypto-asset service providers from 30 December 2024 (White & Case, 2024; Norton Rose Fulbright, 2024). The transitional period closes across the EU on 1 July 2026, after which serving EU clients without authorisation breaches EU law (ESMA, 2026; Global Law Experts, 2026). MiCA travels with Regulation (EU) 2023/1113 on information accompanying transfers of crypto-assets, which imports "travel rule" traceability – precisely the kind of record-keeping on which asset-tracing depends (KPMG, 2023).

The UAE literature stresses the multi-jurisdictional texture of the regime. Cabinet Decision No. 111 of 2022 defines virtual assets and requires onshore service providers to be licensed by the SCA or a local authority (Legal 500, n.d.; askthelaw, 2025); Dubai Law No. 4 of 2022 created

VARA; the ADGM's Financial Services Regulatory Authority and the DIFC's DFSA run distinct regimes, with reformed rules taking effect at the start of 2026 (NEOS Legal, 2026). Federal Decree-Law No. 6 of 2025 then brought virtual-asset payment services under the Central Bank, with penalties reaching AED 1 billion and a compliance deadline of September 2026 (Databird Business Journal, 2025). Dubai's courts have begun to draw practical distinctions, treating private investment as lawful while penalising unlicensed commercial platforms (United Advocates, 2025).

The Procedural Gap

Set side by side, these literatures reveal an imbalance. Substantive recognition has raced ahead; procedural design has lagged. Knowing that Bitcoin is property tells a court that it may be attached, but not how to attach it – how to compel disclosure of a private key, how to direct a custodial exchange to freeze a balance, or how to locate an asset that has no situs. These mechanics are thinly theorised in the scholarship and, in codified Arab civil-procedure statutes, almost entirely absent. The present study is built in that gap, and its evaluative framework is an attempt to give the procedural question the structure the substantive question already enjoys.

Objectives of the Study

The study pursues five objectives, carried forward from the originating proposal and sharpened for evaluation:

To determine the legal nature of virtual assets and digital currencies within the comparative legislative landscape.

To review and analyse existing mechanisms for attachment of, and execution against, these assets.

To identify the principal practical challenges facing judicial and enforcement authorities.

To conduct a comparative evaluation of leading international frameworks using a transparent, replicable instrument.

To propose an integrated procedural framework, and to situate it within the UN Sustainable Development agenda.

Methodology

This is a comparative policy-evaluation study resting on a doctrinal foundation. It integrates four classical legal methods and adds an explicit evaluative instrument so that the comparison can be

conductedtransparentlyratherthan impressionistically.

Analytical method. The study reads the primary instruments – statutes, regulations, and reported judgments – to extract operative rules and to expose ambiguities and gaps relevant to enforcement.

Comparative method. It compares four systems chosen for doctrinal influence and regulatory maturity: the UAE (with its federal and free-zone layers), the EU (MiCA), the UK, and the US. Crucially, the comparison proceeds function-by-function rather than country-by-country, so that functionally equivalent solutions can be set against one another.

Deductive method. From the comparative material it distils general principles and derives recommendations capable of application in Arab civil-procedure systems.

Inductive method. It reasons from documented practice and reported enforcement experience toward broader propositions about what works.

The Enforceability Evaluation Framework

To discipline the comparison, the study scores each system across the five enforcement functions identified above on a five-point scale, where 1 denotes a weak or absent capability and 5 a strong, codified, and operationally effective one. The rubric is set out in Table 1. The scores reflect the authors' structured analytical assessment of the legal material; they are an interpretive coding of doctrine, not survey responses or field measurements, and they are offered as a transparent basis for comparison and critique rather than as quantitative empirical data.

Table 1. Coding rubric for the Enforceability Evaluation Framework.

Score	Meaning applied to each enforcement function
1	No recognised capability; doctrine silent or hostile
2	Capability arguable but untested or highly uncertain
3	Capability recognised in principle; gaps in procedure
4	Capability established with workable procedure

Score	Meaning applied to each enforcement function
5	Capability codified and operationally effective

Applying a single rubric across all systems makes the resulting matrix (Section 5) replicable: another researcher can re-score the same instruments and contest specific cells. The framework's value lies less in the precise numbers than in forcing the analysis to address every function for every system.

Scope and limitations. The study relies only on publicly available primary instruments and reputable secondary commentary; it uses no confidential data and involves no human participants, so no ethical-review approval was required. As a doctrinal evaluation, its findings are interpretive, its scoring is inevitably a matter of reasoned judgement, and its four-jurisdiction scope

– though purposive – does not claim global representativeness. Pinpoint citations to gazetted texts and law reports should be verified against official sources before reliance.

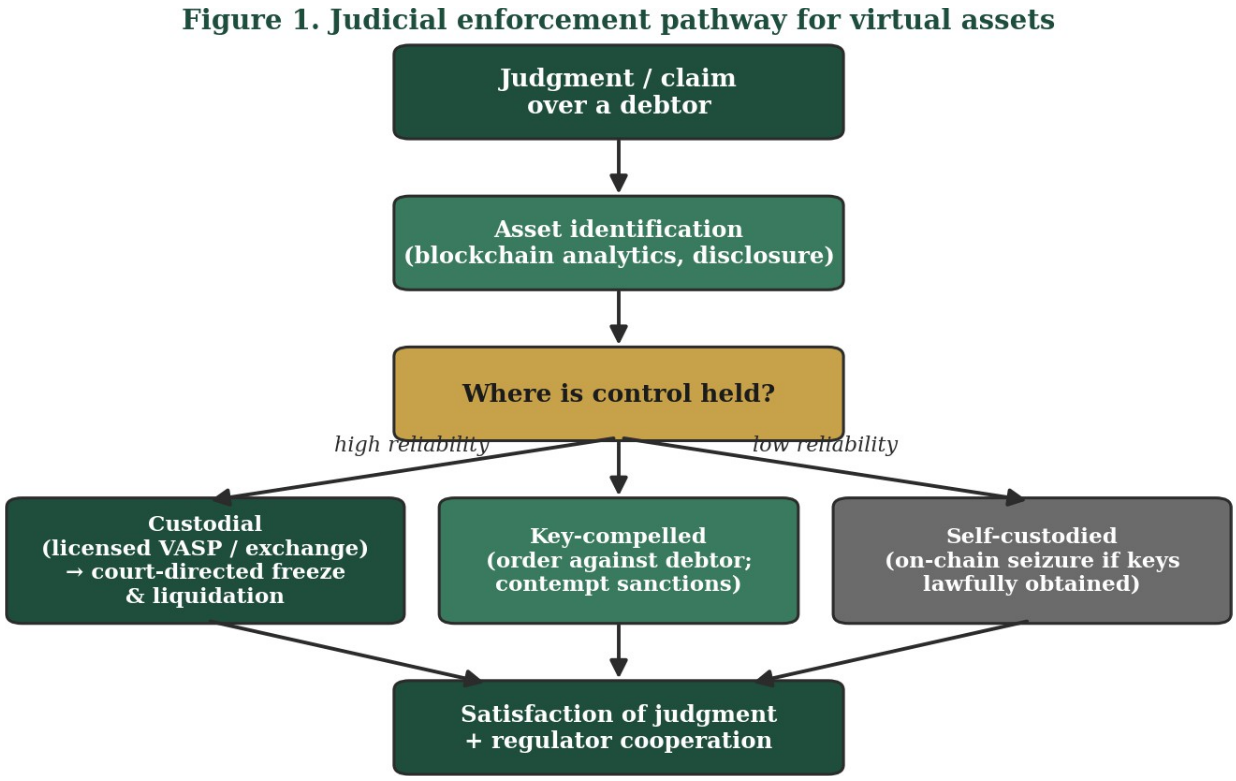
Findings

The findings are organised by the five enforcement functions, then drawn together in the evaluation matrix and comparative profile.

Function One – The Legal Nature of Virtual Assets

The first finding is convergence. Each surveyed system, by its own route, now treats crypto-assets as property or its functional equivalent. England moved through incremental case law and then codified a third category of personal property in the Property (Digital Assets etc) Act 2025. The EU, through MiCA, defines a crypto-asset as a digital representation of value or rights transferable and storable electronically using distributed-ledger technology, regulating it as an economic object while leaving private-law classification to member states. The UAE recognises virtual assets as regulated objects of economic value under Cabinet Decision No. 111 of 2022 and the 2025 Central Bank decree, and its courts distinguish lawful holding from unlicensed commercial dealing (United Advocates, 2025). The US treats crypto as property and, through UCC Article 12, supplies a tailored category of "controllable electronic record." This convergence supports Proposition P1.

Table 2. Legal nature and recognition of crypto-assets.



SystemBasis of recognitionClassificationUAECabinet Dec. 111/2022; FDL 6/2025Regulated asset of valueEUReg. (EU) 2023/1114 (MiCA)Digital representation of value/rightsUKCase law; Property (Digital Assets) Act 2025Third category

of propertyUSACase law; UCC Art. 12Controllable electronic recordSystemBasis of recognitionClassificationUAECabinet Dec. 111/2022; FDL 6/2025Regulated asset of valueEUReg. (EU) 2023/1114 (MiCA)Digital representation of value/rightsUKCase law; Property (Digital Assets) Act 2025Third category of propertyUSACase law; UCC Art. 12Controllable electronic recordFunction Two – Attachment over Digital Holdings

The second finding is that attachability turns on the location of control. Where an asset sits with a regulated custodian or exchange, attachment resembles the garnishment of intermediated funds: a court can direct the custodian to freeze and preserve the balance. Where the asset is self-custodied – controlled by a private key the debtor alone holds – attachment is far harder, because there is no third party to command and compelling production of a key raises evidentiary and rights-based difficulties. English practice illustrates the custodial route, with freezing and proprietary orders given effect through exchanges holding the tokens (D'Aloia). The classic conditions for provisional attachment – a prima facie claim, identifiable assets, and a risk of dissipation – map onto crypto-assets, but the "identifiable assets" limb now depends on blockchain analytics, and the "preservation" limb on a custodian able to comply.

Function Three – Execution Mechanisms

The third finding distinguishes three execution pathways of descending reliability, illustrated in Figure 1: custodian-directed execution, in which a licensed VASP transfers or liquidates assets under a court order; key-compelled execution, in which the debtor is ordered to transfer assets or disclose keys, backed by contempt sanctions; and on-chain seizure, in which authorities take control using lawfully obtained credentials. The first is the backbone of effective enforcement and depends directly on the licensing regimes described earlier; the UAE's consolidation of VASP oversight strengthens it materially.

Figure 1. The judicial enforcement pathway, showing the decisive "where is control held?" branch and the descending reliability of the three execution routes.

Function Four – Cross-Border Jurisdiction

The fourth finding is that jurisdiction is the least settled function. Because ledger entries have no physical situs, courts anchor jurisdiction in proxies

– the holder's domicile or residence, the location of the controlling key, or the seat of the custodian. MiCA's extraterritorial reach (it applies wherever services are provided to EU clients, regardless of provider domicile), coupled with the travel-rule traceability of Regulation (EU) 2023/1113, supplies one workable model. UAE onshore courts possess general competence over civil and commercial matters relating to virtual assets even without a dedicated forum (Global Legal Post, n.d.), but connecting factors remain to be articulated with precision.

The pace of reform across these systems is itself part of the picture. Figure 2 sets the principal developments on a single timeline, showing how substantive and regulatory milestones have clustered in 2024-2026.

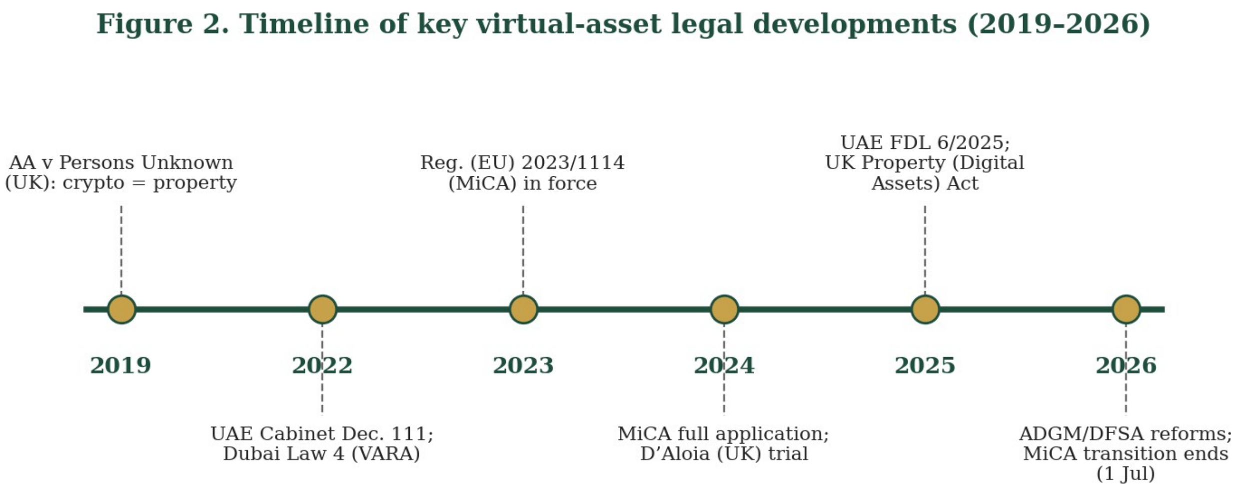


Figure 2. Timeline of key virtual-asset legal developments across the surveyed systems, 2019-2026.

Function Five – The Role of Financial Regulators

The fifth finding is that regulators have become indispensable enforcement partners. Licensing makes VASPs identifiable and subjects them to compliance duties, including freezing and disclosure; AML/CFT and travel-rule regimes generate the records on which tracing depends. In the UAE, coordination between VARA and the SCA, and the Central Bank's consolidated oversight under Federal Decree-Law No. 6 of 2025, convert regulatory supervision into a practical enforcement lever (Khairallah Advocates, 2025; Databird Business Journal, 2025). This finding, with Section 5.2, supports Proposition P2.

The Evaluation Matrix and Comparative Profile

Applying the rubric in Table 1 to the five functions yields the matrix in Figure 3. Two patterns stand out. The legal-nature column is uniformly strong, confirming convergence (P1). The variation that matters lies in execution, jurisdiction, and regulator cooperation – the procedural functions – where scores diverge and where enforcement is actually won or lost (P2).

Figure 3. Enforceability evaluation matrix (authors' analytical coding)

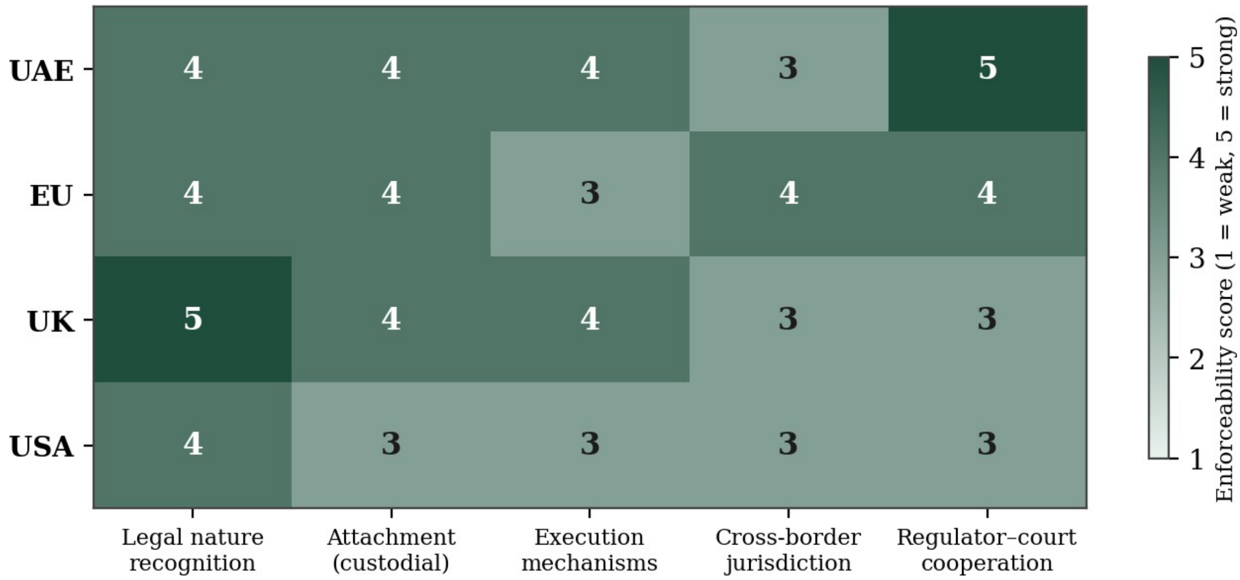


Figure 3. Enforceability evaluation matrix. Scores are the authors' analytical coding of the legal material on the rubric in Table 1, not empirical measurements.

Figure 4. renders the same coding as a comparative profile. The UAE's distinctive strength is regulator-court integration; the UK's is substantive legal clarity; the EU's is cross-border reach through MiCA; the US trails slightly on procedural cohesion owing to the state-by-state adoption of UCC Article 12. No system scores full marks on the self-custody-sensitive functions, which is the empirical shape of Proposition P3.

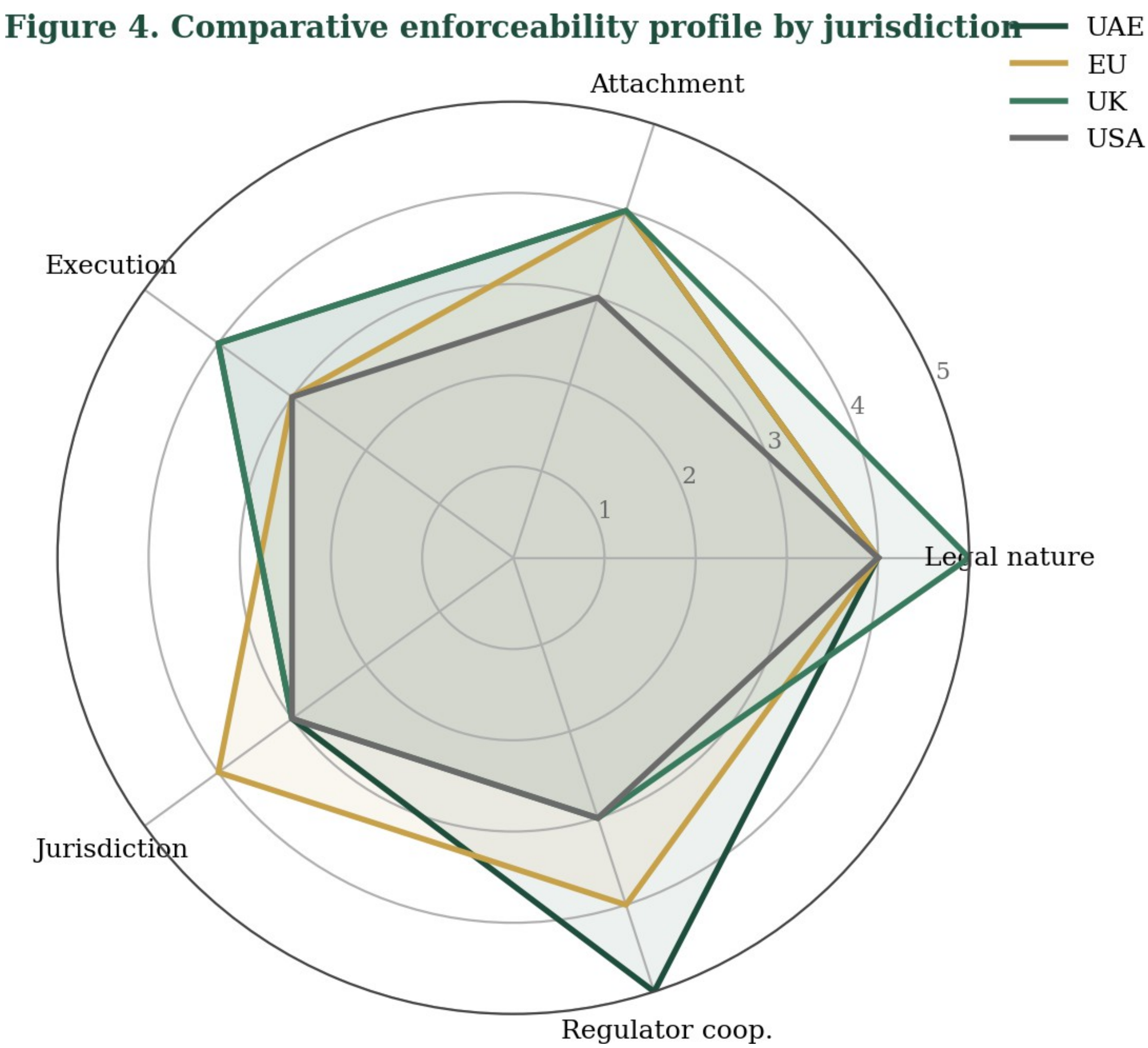


Figure 4. Comparative enforceability profile by jurisdiction across the five functions.

Jurisdiction-Specific Analysis

The matrix compresses each system into five numbers; the underlying reasoning deserves to be set out, because the differences between these jurisdictions are differences of legal tradition as much as of policy.

United Arab Emirates. The UAE's defining feature is the density of its regulatory architecture and the degree of coordination between its components. Onshore, the SCA and the Central Bank share competence; in the free zones, VARA, the ADGM's FSRA, and the DIFC's DFSA operate tailored regimes (NEOS Legal, 2026). Federal Decree-Law No. 6 of 2025 then layered consolidated federal oversight over virtual-asset payment activity, with enforcement teeth in the form of penalties reaching AED 1 billion (Databird Business Journal, 2025). For enforcement purposes, this density is an asset: a large share of value serviced within the UAE sits with licensed entities that can be ordered to freeze and surrender, which is why the UAE scores highest on regulator-court cooperation. The weaker link is the civil-procedure code itself, which does not yet articulate bespoke connecting factors or a key-disclosure regime — a procedural rather than substantive deficit, and therefore one amenable to the reform proposed in Section 7.

European Union. MiCA's contribution is breadth and extraterritorial reach. By applying wherever crypto-asset services are provided to EU clients regardless of provider domicile, and by pairing licensing with the travel-rule traceability of Regulation (EU) 2023/1113, the EU framework supplies both the records needed for tracing and a jurisdictional hook of unusual span (ESMA, 2026; KPMG, 2023). Its limitation, from an enforcement standpoint, is that MiCA regulates conduct and leaves the private-law characterisation of crypto-assets — and the fine grain of attachment procedure

– to twenty-seven national systems, producing uniform market rules atop heterogeneous execution law.

United Kingdom. The UK leads on substantive clarity. A decade of incremental case law, capped by D'Aloia and codified in the Property (Digital Assets etc) Act 2025, has produced the most secure proprietary foundation among the surveyed systems (Clyde & Co, 2025; Lewis Silkin, 2024). English courts have also been inventive procedurally, permitting service by non-fungible token and granting proprietary injunctions enforced through exchanges. The UK scores marginally lower on regulator-court integration than the UAE, reflecting a more market-led and less centrally coordinated supervisory style.

United States. The US presents the paradox of deep markets and fragmented law. Crypto is treated as property and UCC Article 12's "controllable electronic record" offers a tailored category, but adoption proceeds state by state, and federal-state and inter-agency divisions complicate a unified enforcement posture. The result is strong substantive recognition coupled with procedural unevenness – hence the slightly lower profile on the cohesion-sensitive functions.

The Self-Custody and Decentralized-Finance Frontier

Every system examined here shares one blind spot, and it is the same blind spot: the self-custodied wallet and the decentralized protocol. The enforcement pathway in Figure 1 is reliable precisely where an intermediary stands between the court and the asset. Remove the intermediary – as self-custody and decentralized finance (DeFi) do by design – and the custodian-directed route, the most effective one identified in this study, simply disappears.

Three difficulties compound. First, identification: a self-custodied wallet need not be linked to any verified identity, so the "identifiable assets" condition for attachment may fail at the threshold. Second, control: with no third party to command, enforcement collapses onto the debtor, who may plead inability, loss of keys, or simple non-compliance, leaving contempt sanctions as the only lever. Third, mobility: assets can be moved or swapped through decentralized exchanges faster

than provisional relief can be obtained. The UAE's Federal Decree-Law No. 6 of 2025 attacks part of this problem at its root by ending the "just code" defense and bringing decentralized arrangements within the Central Bank's perimeter (Databird Business Journal, 2025) – an approach that converts some would-be non-custodial activity back into a regulated, and therefore reachable, form. But where genuine self-custody persists, no surveyed framework offers a complete answer, which is why the recommendations in Section 7 pair custodial tools with realistic expectations and investment in forensic capability rather than promising a procedural cure-all.

Discussion

Taken together, the findings shift the locus of the enforcement problem. The dominant obstacle is no longer doctrinal but procedural and infrastructural. The question that animated the first wave of litigation – is it property? – has been answered, and answered the same way everywhere (P1). What remains contested is institutional: whether the asset can be reached through a regulated intermediary, whether the court holds tools calibrated to on-chain holdings, and whether regulators and courts can act quickly enough to prevent dissipation (P2).

This reframing carries a direct lesson for Arab legal systems, the UAE foremost among them. The most consequential reform is not a new definition of "digital money" in the civil code but the insertion of procedural provisions that let courts direct licensed custodians to freeze and surrender assets, that admit blockchain-analytics evidence, that provide a proportionate regime for compelling key disclosure, and that open expedited regulator-to-court channels. The UAE is well placed to legislate exactly this, because its licensing architecture already renders much locally serviced value custodial and therefore reachable (P4).

The comparison also exposes a structural asymmetry that policymakers ignore at their peril. As licensing tightens, custodial assets become steadily easier to reach – but self-custodied assets remain stubbornly difficult, because no intermediary stands between the court and the key. Tightening regulation therefore has a paradoxical edge: it sharpens enforcement against compliant intermediated holdings while leaving a determined debtor's self-custodied holdings largely untouched (P3). Sound policy pairs custodial-directed tools with realistic expectations about self-custody and with investment in forensic capability, rather than

assuming that a strong licensing regime resolves enforcement on its own.

These conclusions extend the existing literature rather than merely echoing it. The scholarship has established that crypto-assets are property and that service providers can be regulated; it has paid far less attention to engineering the procedural bridge between a judgment and an on-chain holding. The Enforceability Evaluation Framework is offered as one way to make that bridge visible and to compare how well different systems have built it.

From Diagnosis to Implementation

If the diagnosis is procedural, the cure must be procedural too – and it must be sequenced realistically. A jurisdiction cannot legislate effective enforcement overnight, but it can build it in a deliberate order. The analysis suggests three phases. In the near term, the priority is to codify custodian-directed orders and to admit blockchain-analytics evidence, because these capture the largest and most reachable share of value at the lowest institutional cost. In the medium term, attention turns to connecting factors for cross-border disputes and to expedited regulator-to-court channels, which require inter-agency design and, ideally, reciprocal arrangements with peer jurisdictions. In the longer term, a calibrated key-disclosure regime, with proportionate safeguards against self-incrimination and disproportionate coercion, addresses the self-custody frontier as far as any legal tool can.

This sequencing matters for the UAE in particular. Because its licensing architecture already renders much value custodial, the near-term phase delivers most of the available enforcement benefit quickly, and the harder, slower reforms can follow without holding up the gains. It is a rare instance in which the most consequential reform is also the most administratively tractable.

Practical Challenges for Enforcement Authorities

Beyond the design of rules lies the harder question of institutional capability. Three practical challenges recur across the surveyed systems and will shape any reform's success. The first is forensic capacity: attaching a crypto-asset presupposes the ability to trace it, which in turn presupposes analysts, tools, and admissible methods that many enforcement bodies are still acquiring. The second is speed: provisional relief is worthless if it arrives after the assets have moved, so the procedural framework must compress the interval between application and freeze, ideally through standing channels to licensed custodians. The third is coordination: enforcement against borderless assets requires courts, financial regulators, and foreign counterparts to act in concert, and the absence of routine channels – rather than any doctrinal barrier – is often what defeats recovery in practice. The UAE's existing VARA-SCA-Central Bank coordination is a structural advantage here, and the recommendations build on it deliberately.

Alignment with the UN Sustainable Development Goals

The reform agenda advanced here is not only a technical fix; it advances several Sustainable Development Goals, summarised in Figure 5 and Table 3. Most directly, effective and predictable enforcement is an instance of SDG 16 (peace, justice, and strong institutions): access to justice is hollow if judgments cannot be executed, and the rule of law depends on remedies that bite. A clear procedural framework for digital assets builds the legal infrastructure for innovation under SDG 9, and underpins the investor confidence and orderly digital finance that drive growth under SDG 8. Because virtual assets are inherently cross-border, enforcement depends on cooperation between regulators and courts across jurisdictions – the partnership ethos of SDG 17.

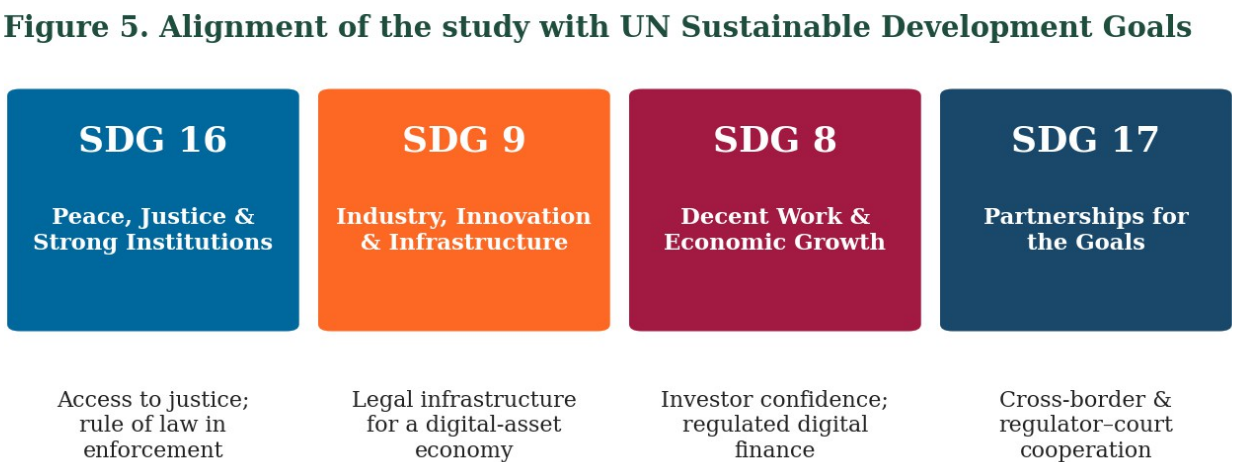


Figure 5. Alignment of the study's contribution with UN Sustainable Development Goals.

Table 3. Mapping of study contributions to UN SDG targets.

SDG	Relevant focus	Contribution of this study
16	Access to justice; rule of law	Procedural tools so judgments are enforceable
9	Innovation; infrastructure	Legal infrastructure for a digital-asset economy
8	Growth; decent work	Investor confidence; regulated digital finance
17	Partnerships	Cross-border regulator-court cooperation

Conclusion, Implications, and Recommendations

This study asked whether existing frameworks adequately support judicial enforcement and attachment over virtual assets, and what an optimal framework would require. Evaluated against the comparative material, the four propositions hold: property recognition has converged and is no longer the binding constraint (P1); enforcement effectiveness turns on custodial reachability and regulator-court integration (P2); a custodial/self-custodial asymmetry persists that regulation alone cannot cure (P3); and mature-licensing jurisdictions such as the UAE can achieve effective enforcement chiefly through procedural reform (P4).

On that basis, the study recommends an integrated procedural framework for Arab civil-procedure systems, built on five components:

Asset identification. Statutory authority for courts to admit blockchain-analytics evidence and to order disclosure of wallet information from licensed VASPs.

Custodian-directed orders. Express power to direct licensed custodians to freeze, preserve, transfer, or liquidate balances under provisional or executory orders.

Key-disclosure regime. A calibrated, proportionate mechanism to compel debtors to surrender or transfer self-custodied assets, with contempt sanctions and appropriate safeguards.

Cross-border rules. Clear connecting factors (holder domicile; custodian seat) and channels for international cooperation in tracing and freezing.

Regulator-court cooperation. Expedited statutory channels linking VARA, the SCA, the Central Bank, and the courts, building on existing UAE coordination.

The practical implication is encouraging for the UAE and the wider region: effective enforcement is achievable primarily through targeted procedural reform rather than wholesale recharacterisation of digital assets, leveraging a licensing architecture that is already mature. Future research should test the framework against decided enforcement cases as a body of jurisprudence accumulates, and should examine decentralized-finance and non-custodial protocols, where the custodial route – the most reliable one identified here – is unavailable by design. The Enforceability Evaluation Framework is offered as a reusable instrument for that work.

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