

The Jurisprudential Boundaries of an Interest-Free Substrate: Riba, Gharar, Maysir, and Qabd in Cash-Settled Synthetic Instruments

A Research Note*

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Abstract

Efforts to engineer Shariah-compliant financial infrastructure frequently conflate the elimination of interest (*riba*) with the holistic resolution of all contractual defects (*fasad*). A decentralised ledger can structurally eliminate the time-value of money by coding monetary neutrality ($\iota = 0$) into consensus; but *fiqh al-muamalat* treats *riba*, *gharar* (excessive uncertainty), *maysir* (gambling), and *qabd* (possession) as distinct pillars requiring independent remedies. Synthesising classical and contemporary jurisprudence on cash-settled synthetic derivatives, this paper states precisely where algorithmic compliance ends and qualitative judgment must begin, and proposes four product-layer rules under which asset-backed instruments built on an interest-free substrate address the remaining pillars by construction, with the intent residual reserved to Shariah-board judgment. The claim is bounded: the substrate resolves *riba al-nasiah*; it does not, on its own, settle *gharar*, *maysir*, or *qabd* for cash-settled synthetics.

Keywords: *riba*; *gharar*; *maysir*; *qabd*; Islamic derivatives; cash-settled synthetics; Islamic CDS; *tabarru*; *takaful*; AAOIFI; Shariah compliance.

JEL classification: G13; K12; P48; Z12; G23.

1 Introduction

The promise of a Shariah-compliant decentralised ledger is easily overstated. A recurring pattern in the literature on Islamic cryptocurrency and digital finance is to establish that some interest-bearing feature has been removed and to infer that the resulting instrument is therefore permissible—an inference that collapses the several distinct prohibitions of *fiqh al-muamalat* into the single question of interest. This note resists that collapse. It takes as given that an interest-free consensus substrate can be built—that *riba* can be foreclosed at the level of the protocol’s own rules—and asks the harder question that remains: what such a substrate does *not* settle, and under what conditions instruments built upon it can satisfy the prohibitions it leaves open.

*A concept note companion to the κ -rate research program. It states precisely what an interest-free consensus substrate resolves and what remains for jurisprudential adjudication, and is intended as a basis for engagement with qualified Shariah scholarship.

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The contribution is twofold. First, it draws the boundary precisely, distinguishing *riba*—a defect of monetary extraction, resolvable mechanically—from *gharar*, *maysir*, and *qabd*, which are defects of contractual ontology, intent, and delivery, and are not. Second, it proposes four product-layer rules—each an established principle of Islamic commercial law—under which asset-backed instruments built on the *riba*-free foundation address the remaining pillars by construction, and it identifies the residual that no architecture can resolve and that properly belongs to jurisprudential judgment. The register throughout is deliberately conservative: the aim is to state what is and is not claimed, so that the line between engineering and jurisprudence is drawn rather than blurred. The remainder treats the *riba*/ontology boundary; then *qabd*, *gharar*, and *maysir* in turn; then the four structuring rules and a comparative taxonomy of what is resolved and what remains.

2 The epistemic boundary: *riba* vs. contractual ontology

The κ -Chain’s consensus layer mechanically eliminates *riba al-nasiah* by enforcing a strict $\iota = 0$ invariant: a transaction whose decoded state transition implies a positive interest parameter is rejected at inclusion, and a proposer who admits one is slashed.¹² That a zero-interest environment is *necessary but not sufficient* is the settled position of the modern critical literature. El-Gamal (2006) and Usmani (2002) criticise the industry’s “Shariah arbitrage”—replicating conventional cash-flows without interest while ignoring the economic substance of the underlying contract. Code can guarantee that money does not breed money; it cannot adjudicate the *ontological reality* of the asset traded. Resolving *riba* therefore *isolates* the remaining defects; it does not cure them. The classical monetary ontology under which $\iota = 0$ is the operationalization of money as a neutral measure—rather than a regulatory expedient—is developed in the companion paper (Ahmed & Bhuyan, 2026); the present note begins where that argument ends.

3 Qabd (possession): the hardest pillar for cash-settled synthetics

A valid sale classically requires transfer of ownership and the assumption of ownership risk (*daman*) before profit is taken. AAOIFI Shariah Standard No. 20 (Sale of Commodities in Organized Markets) and Usmani (2002) require genuine delivery for forward and futures structures; SS-20 in fact declares conventional futures and options impermissible as formed and traded (AAOIFI, 2015), and Kamali (1999) surveys the prospects for an Islamic derivatives market within precisely this constrained space. al-Amine (2008) notes that cash-settled derivatives, trading abstract claims rather than assets in hand, risk violating *bay’ al-kali’ bi-l-kali’* (the prohibited sale of debt for debt; cf. AAOIFI SS-10 on *Salam*).

A blockchain guarantees *qabd hukmi* (constructive possession) of native margin collateral via cryptographic control. It cannot manufacture possession of an external real asset merely *referenced* by an oracle. Cash-settled synthetic settlement is, on this point, a legal fiction.

The classical *fiqh* of possession is more textured than a single rule. Jurists distinguish *qabd haqiqi* (physical possession—taking the commodity in hand) from *qabd hukmi* (constructive

¹Throughout, the *riba* foreclosed at consensus is *riba al-nasiah*—the deferment-based excess that interest instantiates and that a pricing layer can host. *Riba al-fadl* in spot exchanges of ribawi commodities is a matter of product-layer exchange (*sarf*) rules and falls under the structuring rules of Section 5, not the consensus invariant.

²For the reader outside distributed systems: the substrate is a proof-of-stake blockchain whose consensus rules are specified to make a positive interest parameter unrepresentable in valid state; $\mathbf{x}/\text{shariah}$ denotes its transaction-admission gate, and ABCI++ vote extensions are the mechanism by which validators jointly determine an external price. At the time of writing the consensus layer is a specification; the instruments’ reference implementation runs on a public testnet.

possession—legal control without physical transfer, as when goods are placed at the buyer’s disposal or represented by a recognised document of title). That distinction is exactly what makes a digital analogue conceivable: a cryptographically controlled, registry-backed token over a real, identified asset can plausibly constitute *qabd hukmi*, in the way a warehouse receipt or a registered title does. What it cannot do is constitute possession of an asset that does not exist within, or is merely referenced by, the system—the situation of a cash-settled synthetic whose “underlying” is an external price index. The *salam* contract is the instructive exception that proves the rule: classical law permits the sale of a described, deferred-delivery commodity precisely *because* delivery of a real, specified good is contracted for and the price is paid in full at contract—conditions the standards on organised markets preserve and which cash settlement removes. The requirement throughout is *daman*: that the party claiming profit has first borne the risk of ownership.

4 Gharar (excessive uncertainty): the non-existent underlying

al-Dharir (1997) defines *gharar* as arising chiefly where the object of contract is non-existent, undeliverable, or unspecified. al-Amine (2008) and Usmani (2002) argue synthetic derivatives carry a fundamental *gharar* because the subject matter is a mathematical abstraction (a price index), not a tangible commodity — *la tabi’ ma laysa ’indak* (“do not sell what you do not possess”); Dusuki & Abozaid (2007) situate this within the broader *maqasid* critique of form-over-substance engineering.

An ABCI++ BFT-median oracle eliminates *measurement* *gharar*—the price is exact, transparent, and manipulation-resistant. It cannot eliminate *ontological* *gharar*: that the parties trade a feed, not a deliverable.

Not all uncertainty voids a contract; the jurisprudence is graduated. al-Dharir (1997) distinguishes *gharar fahish* (excessive, contract-voiding uncertainty) from *gharar yasir* (minor, tolerated uncertainty inseparable from ordinary commerce), and locates the prohibited kind chiefly in three conditions: that the object of contract be non-existent, that it be undeliverable, or that its essential attributes be unspecified. A cash-settled synthetic can fail on the first two at once: there is no object to deliver, because the “object” is a number derived from a price feed. This is what separates the *gharar* a protocol can cure from the *gharar* it cannot. A deterministic oracle removes uncertainty about *measurement*—the price is exact, public, and manipulation-resistant, so the specification defect (*jahala*) of an ambiguous reference price is eliminated—but no oracle can supply an object where there is none. The asset-backing rule below is the direct response: by requiring that the object of contract be a real, existing, deliverable asset, it converts the prohibited *gharar fahish* of the non-existent underlying back into the tolerated *gharar yasir* of ordinary commercial risk.

5 Maysir (gambling) vs. tahawwut (legitimate hedging)

Islamic economics distinguishes *tijara* (legitimate commercial risk) from *maysir/qimar* (zero-sum gambling). Bacha (1999) and Obaidullah (1998) observe that in cash-settled futures one party’s gain exactly equals the counterparty’s loss, driven by price movement rather than real value creation—structurally close to *qimar*. A *minority* view (Kamali, 2000) holds that a derivative used strictly for *tahawwut* (hedging) serves a valid *maslaha*; but distinguishing hedger from speculator requires assessing intent (*niyya*) and off-chain exposure. A central limit order book is blind to *niyya*: it cannot tell a farmer hedging a real harvest from a trader gambling at leverage. The execution layer cannot filter *maysir*.

The line between *maysir* and legitimate risk is among the most contested in the field, and the contest is substantive rather than terminological. *Qimar* (gambling) is classically defined as

an arrangement in which each party’s gain is contingent on the other’s loss, with no creation of real value and no productive risk borne—a description that fits a naked, cash-settled position uncomfortably well. The defence of derivatives in Islamic law turns, accordingly, not on denying this structure but on the *purpose* the instrument serves: Kamali (2000), in the most sustained argument for permissibility, holds that where a derivative is used for *tahawwut*—genuine hedging of a real economic exposure—it advances a recognised *maslaha* (public interest) and should not be assimilated to gambling. The difficulty, which Kamali concedes, is evidential: hedging and speculation are distinguished by the trader’s purpose and off-contract position, neither of which is legible to a matching engine. This is why the structural response below does not attempt to read intent but to remove the *occasion* for pure speculation—by requiring, through the insurable-interest rule, that a protection buyer hold the exposure being protected, so that the instrument is necessarily a hedge of something owned rather than a wager on something not.

The aggregation objection. A sophisticated objection runs: for a *diversified* holder of many κ -instruments, the law of large numbers renders the portfolio’s return near-deterministic — is the result not functionally a fixed return, *riba* by another route? We submit the question to the reader’s judgment with one observation from the classical materials: the prohibition attaches to the *contract* — a predetermined excess owed by a specific counterparty irrespective of outcome — and not to the statistical stability that *emerges* when many genuinely risk-bearing positions are aggregated. A *mudarabah* fund spread across a thousand ventures, a *takaful* operator’s pooled book, a broadly diversified equity portfolio: each yields stable aggregate returns, and none has been held to constitute *riba* on that account, because every constituent position remains individually loss-bearing and no party owes the stability by obligation. Whether this distinction is dispositive for κ -portfolios is, like everything in this note, for qualified scholarship to rule upon; we record the precedent so the question arrives with its strongest available answer attached.

6 Structuring for compliance: four product-layer rules

The constructive answer is not to claim code resolves *gharar*, *maysir*, and *qabd*—it cannot—but to make the *compliant instrument class* satisfy them structurally, enforced at the same consensus gate ($\mathbf{x}/\mathbf{shariah}$) that the design already specifies to enforce $\iota = 0$, leverage caps, and full-notional (anti-naked) collateral. Four rules complete it. The rules themselves are not novel: asset-backing, insurable interest, the prohibition of naked positions, and *tabarru* risk-sharing are established compliance principles (Kamali, 2000; AAOIFI, 2015; El-Gamal, 2006). The contribution here is their enforcement as *consensus-level invariants* on a *riba*-free substrate, and the explicit boundary that separates them from the *riba* the substrate has already foreclosed.

1. **R1 — Asset-backing whitelist** (*gharar*). A tradable instrument must reference an on-chain token representing a real, registered, deliverable asset (sukuk certificate, warehouse receipt, commodity or property title), not a bare price feed. The oracle resolves measurement *gharar*; asset-backing resolves existential *gharar* (the subject of contract exists and can be delivered).
2. **R2 — Possession-gating** (*qabd*). Enforce *qabd hukmi*: a party must hold the asset-token (cryptographic control plus a registry record, e.g. the Qatar Financial Centre’s (QFC) Digital Receipt System) before reselling forward or taking profit. The gate rejects any forward or sell order from a party not in possession—the on-chain form of *la tabi’ ma laysa ’indak*—so ownership risk (*daman*) rests on the holder before resale.

3. **R3 — Insurable-interest / no-naked rule** (*maysir* and *qabd*) for credit instruments. For an Islamic CDS, require the protection *buyer* to hold the reference obligation (insurable interest), converting a naked wager into a *kafala* (guarantee) over an owned, real exposure; the protection seller posts full notional (anti-naked, part of the gate’s specification and enforced in the reference implementation). With neither side naked, the contract is risk transfer on a real owned exposure, not a zero-sum bet — the structural (naked, zero-sum) surface of *maysir* removed by construction, with the intent residual remaining for the Board rather than being policed by code.
4. **R4 — Expiry / delivery and tabarru wrappers** (*gharar* and *maysir*). Prefer expiring, deliverable structures (*salam*, *murabaha*, *ijara*, expiring options on owned assets) over perpetual cash settlement, and use *tabarru* (mutual-donation) takaful pools for risk products — risk-sharing tied to real loss, not a price bet.

The honest residual. The intent (*niyya*) component of *maysir* is not code-governable. R1–R4 remove the naked, zero-sum surface; the remainder is for the Board through access classes (hedging-only or institutional tracks vs. open retail) and position-purpose attestation. Code minimises the surface; the Board rules on the residual.

Two-track architecture. *Track A*—the perpetual-futures DEX—is riba-free ($\iota = 0$) but cash-settled and synthetic, and therefore remains subject to an open fatwa on *gharar/maysir*. *Track B*—the asset-backed compliant class (sukuk, commodity *murabaha*, tokenised real-world assets, iCDS-as-*kafala*-on-owned-exposure, takaful)—addresses *gharar* and *qabd* by construction and removes the structural (naked, zero-sum) component of *maysir* via R1–R4, on the same riba-free substrate, with the intent residual reserved to the Board and final adjudication of all three pillars resting with qualified scholarship. The two tracks also order the launch sequence: asset-linked instruments—e.g. protection on owned sukuk exposures, vault-secured tokenised commodities, and a constant-maturity sukuk-yield benchmark for institutional liquidity management—precede any cash-settled synthetic, which remains the hard case pending the open fatwa.

Two worked examples make the rules concrete. Consider, first, a tokenised sovereign *sukuk* traded forward on the compliant venue. Asset-backing is satisfied because the token represents a registered certificate over a real, income-producing asset, not a price index (R1); possession-gating requires that a seller hold the token—and so bear ownership risk—before transferring it forward, the transfer recorded as *qabd hukmi* (R2); and the instrument is an expiring, deliverable claim rather than a perpetual cash settlement (R4). Consider, second, an Islamic credit-protection contract over that sukuk. The protection seller posts the full notional as collateral, so no uncovered (naked) protection can be written (the specified anti-naked rule); the insurable-interest rule additionally requires the protection *buyer* to hold the reference sukuk, converting the contract from a wager on a third party’s default into a *kafala*—a guarantee of an exposure the buyer actually carries (R3). In each case the instrument that clears the gate is not a synthetic abstraction but a claim tied, at both ends, to a real and owned asset. The rules do not make speculation impossible; they make the compliant class structurally a class of hedges and real-asset transactions rather than bets.

7 Comparative taxonomy

8 The riba question, measured (addendum, 2026)

The boundary this paper draws can now be located empirically. An out-of-sample validation of the κ -corpus (Ahmed & Bhuyan, 2026, P15) confirms that ι —the predetermined, guaranteed component that defines *riba al-nasiah*—is removable in the data (the conventional-venue funding floor vanishes at $\iota = 0$, the systematic transfer goes to zero); the removability is given a rigorous

Pillar	Core defect	Resolved by	Residual risk
Riba	yield on idle capital / time	substrate ($\iota = 0$, consensus; <i>riba al-nasiah</i>)	<i>riba al-fadl</i> in spot exchange: product layer (<i>sarf</i> rules)
Gharar	asset non-existence / non-delivery	product (asset-backing, R1); oracle for measurement	synthetics: ontological gharar
Qabd	ownership/risk before profit	product (tokenised RWA + receipts, R2)	synthetics: possession a fiction
Maysir	zero-sum gambling	product (<i>tabarru</i> + real-exposure, R3–R4)	intent (<i>niyya</i>) not code-governable

Table 1: What the substrate resolves and what remains: pillar, defect, locus of resolution, residual.

footing in the Separation Theorem, where the pricing operator is analytic at $\iota = 0$ for any positive convergence intensity (Ahmed & Bhuyan, 2026, P17). What remains is a return of the permitted kind, and a companion paper (Ahmed & Bhuyan, 2026, P16) measures how much of it is realised hazard versus risk premium. Decomposing the convergence intensity into the physically realised intensity κ_P and the priced intensity $\kappa_Q = s/(1 - \delta)$, the risk-premium share $1 - \kappa_P/\kappa_Q$ varies across domains by almost two orders of magnitude: a measured $\sim 18\%$ for takaful (premiums equal expected loss plus a margin), and the great majority for sovereign credit (bounded below near 45% by a short default record, plausibly $\sim 85\%$), highest for the safest credit and largest in crises.

This sharpens, and does not dissolve, the reservation this paper makes. It shows that the open question is not “is κ interest?”—the predetermined charge is gone—but the narrower and genuinely contested one: *is a fully contingent, loss-bearing risk premium, stripped of every predetermined charge, riba in substance, or the permitted form of return under al-ghunm bil-ghurm?* Under *al-ghunm bil-ghurm*—entitlement to gain tied to liability for loss, the basis of *mudarabah* and *musharakah*—a contingent, loss-bearing, non-predetermined return is the permitted form of profit; rarity of realised loss does not convert risk-bearing into a stipulated increment. The stricter view holds that a systematic, priced return is the discount rate in substance, and that pricing default risk on debt raises *bay‘ al-dayn* and *gharar* independently. The decomposition confirms both concerns are real and cannot adjudicate between them. Its practical corollary is sharp: the realised-hazard products (takaful) are sound on form *and* substance and need no resolution of the open question, while the credit and monetary layer stands on the contested ground and, by the safest-credit result, on its most premium-laden part—a frontier gated explicitly on the Board’s ruling, R3/R4 (§6) being the structural pre-conditions and this the substantive question reserved.

A pricing resolution that narrows the reservation. The structural rules R1–R4 already recast credit protection as a *kafala* over an owned, possessed exposure inside a *tabarru* pool—form-sound by construction. The decomposition adds a resolution on *substance* available at the product layer *without* a prior ruling on the open question. Because κ separates into a realised part κ_P and a priced part κ_Q , the compliant cooperative-guarantee form can price its contribution at the *realised hazard* $\kappa_P(1 - \delta)$ —the actuarially fair expected loss, exactly as a *takaful* contribution is set—rather than at the market-priced $\kappa_Q(1 - \delta)$ a tradeable spread quotes. The contested risk-premium wedge $1 - \kappa_P/\kappa_Q$ is then not *sold* to a protection writer for profit but retained by the mutual pool and returned as surplus, with a disclosed *wakala* fee for administration. Priced this way, credit-loss cover is structurally the takaful case this paper already holds riba-free in substance: a mutual indemnity, gated on insurable interest and *qabd hukmi* over the reference obligation, funded at expected loss. The reservation therefore narrows sharply. The open question is no longer the broad “is a priced risk premium riba?” but the

two residuals that survive the κ_P -priced mutual structure— whether tokenised title constitutes valid *qabd* for the reference obligation, and whether the *wakala* loading is genuinely a fee for service rather than the risk premium reintroduced under another name—both narrower, both answerable, both reserved to the Board. We do not represent this as settling the matter; we record that the product layer can meet the boundary far closer than a cash-settled spread priced at κ_Q could, and that where it cannot reach is now precisely located.

9 Conclusion and request for judgment

The $\iota = 0$ substrate is a definitive, structural resolution of *riba al-nasiah*—a clean, interest-free ledger and a market-determined, non-negative pricing measure. It is a necessary foundation, not a sufficient condition, for holistic compliance. *Gharar*, *maysir*, and *qabd* are matters of asset ontology, contractual intent, and delivery—the domain of jurisprudential interpretation. It is on these precise boundaries—how to construct, restrict, collateralise, or asset-back synthetic pricing environments built on a *riba*-free substrate—that qualified Shariah scholarship must adjudicate; this note sets them out so that the line between what an architecture can settle and what it cannot is drawn explicitly rather than elided.

There is a more general point in this division of labour. The *maqasid* tradition holds that the prohibitions of commercial law are not arbitrary constraints but protections of identifiable goods—the integrity of exchange, the linkage of return to real risk, the circulation rather than the hoarding of wealth. Read in that light, an interest-free substrate and the four structuring rules are not a checklist of avoidances but a positive design: a system whose default state is the exchange of real, owned, deliverable value, in which interest is absent because the architecture has no place to put it and speculation is curtailed because the instruments are tied to ownership. What such a system cannot do is legislate the intention of those who use it, and it should not pretend to. The honest position—and, we have argued, the strongest one before a jurisprudential audience—is to build the foundation as soundly as the engineering permits, to state plainly the boundary at which engineering ends, and to refer what lies beyond it to those whose competence it is.

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