# The $\kappa$-Standard: Debt-Free Money Creation under a Riba-Free Convergence Intensity

Uniting the Chicago Plan and Islamic Full-Reserve Monetary Theory

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**Abstract**

Two traditions of monetary reform—the Islamic interest-free programme of Al-Jarhi (1981) and Chapra (1985), and the Western full-reserve tradition of Fisher (1936) and Benes & Kumhof (2012)—independently reached the same design: money should be created debt-free by the state and separated from interest-bearing bank credit. Both stalled at the same point. Once money creation is divorced from interest-bearing debt, the assets that back the money base must still be *priced*, and the natural pricing object—the risk-free interest rate $r$—is precisely the riba the reform sets out to remove. Neither tradition supplied a riba-free price at which the market could clear. This paper provides one.

Building on the convergence intensity $\kappa$ of Ackerer et al. (2025), shown by the companion papers to be a riba-free, no-arbitrage pricing primitive estimable from real sukuk markets, we construct the *$\kappa$-Standard*: a monetary architecture in which (i) base money equals the $\kappa$-priced value of a portfolio of sovereign perpetual sukuk, so that money is sovereign equity rather than debt; (ii) new money is created only by monetising new real-sector projects at their $\kappa$-implied price, tethering money growth to real output; (iii) open-market operations transmit through the system-wide convergence intensity $\bar{\kappa}$ rather than an interest rate, with the central bank setting the *quantity* of money while the market sets the *price of capital*; and (iv) commercial banks operate under one hundred per cent reserves, splitting into fee-based (*ujrah*) custody and profit-sharing (*mudarabah*) investment.

We derive the law of motion of the money supply and show that a shock to $\bar{\kappa}$—a system-wide credit deterioration—contracts the base automatically. We then derive a countercyclical issuance rule that neutralises this revaluation channel and holds the base on a target growth path. The correction is bounded by available real capacity and a Sovereign Stabilisation Fund — a deliberate trade of unbounded-but-unbacked fiat stabilisation for bounded-but-backed stabilisation (roughly \$3.6 bn per 100 bp on the full actively-quoted USD-sukuk cross-section, \$195.2 bn of par).

We are explicit about what the architecture does *not* achieve: it removes debt-financed and unbacked money creation and ties money to real-asset value, but its price level is determinate only under a fiscal closure — the natural determinacy closure for a system with no interest-rate instrument[1] — and a companion paper shows this survives in full general equilibrium. Its stabilisation is bounded. We propose $\kappa$ as a candidate riba-free clearing object that lets a full-reserve money base clear without an interest rate, serving both the Chicago-Plan and Islamic full-reserve programmes; we do not claim it was the sole obstacle to either programme's adoption, which is substantially institutional and political. The empirical reality of $\kappa$ rests so far only on the authors' own companion working papers, pending independent replication, so we present this as a theoretical architecture.

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[1] A constant-money-growth (quantity) rule with well-defined money demand can also deliver determinacy without an interest instrument, but only up to speculative-bubble equilibria; the fiscal closure used here pins the price level uniquely.

**Keywords:** riba-free money; full-reserve banking; Chicago Plan; sovereign money; convergence intensity; $\kappa$-rate; debt-free seigniorage; Islamic monetary economics; tokenised sukuk.

**JEL codes:** E42, E51, E58, G21, P43, Z12.

## 1 Introduction

In the contemporary monetary system the overwhelming majority of money is created by commercial banks when they extend loans (McLeay et al., 2014; Werner, 2014; Jakab & Kumhof, 2015), and the residual is created by central banks purchasing interest-bearing government debt. In both channels the money supply expands only when some party incurs an interest-bearing liability. Money is, structurally, a debt instrument that accrues *riba*—a predetermined excess over principal, independent of the underlying economic outcome (El-Gamal, 2006).

This is not a peripheral feature. It is the reason two otherwise unrelated schools of monetary thought converged, decades apart and from opposite premises, on the same reform. On the Islamic side, Al-Jarhi (1981) designed an interest-free monetary structure built on central-deposit certificates and open-market operations, insisting that seigniorage belong to the state and that new money fund real productive projects rather than interest-bearing loans; Chapra (1985) and Khan & Mirakhor (1987) added the macro frame, requiring money growth to track real output and rejecting the fractional-reserve creation of money as debt, and the later risk-sharing literature (Iqbal & Mirakhor, 2011; Askari et al., 2012) made equity rather than debt the organising principle. On the Western side — building on the 1933 Chicago memorandum of Knight, Simons and colleagues — Simons (1936) and Fisher (1936) proposed one hundred per cent reserve banking to separate money creation from bank credit, a programme later endorsed by Friedman (1960), revived as sovereign money (Dyson et al., 2016), and validated in a modern dynamic general-equilibrium model by Benes & Kumhof (2012), who showed that money issued as state equity rather than debt could reduce business cycles, eliminate bank runs, and permit large reductions in public and private debt.

Both traditions reached the same wall. If money creation is to be severed from interest-bearing debt, the real assets backing the money base must still be priced so that the market can clear—and the obvious pricing object, the risk-free rate $r$, is exactly the riba the reform exists to remove. The Chicago Plan's general-equilibrium clearing still runs through an interest rate; Al-Jarhi and Chapra specified the institutional plumbing but no clearing price. Each school knew the money base had to be debt-free; neither could say at *what price* the assets behind it should trade once interest was abolished.

**Contribution.** This paper proposes $\kappa$ as a candidate for that missing price. Ackerer et al. (2025) prove that a perpetual contract is governed by two parameters—a convergence intensity $\kappa$ and an interest parameter $\iota$—and that at $\iota = 0$ the contract retains a unique, arbitrage-free price: the risk-neutral expectation of the spot value sampled at an exponentially distributed stopping time of mean $1/\kappa$. Pricing survives the removal of interest; $\kappa$ does the work that $r$ used to do. The companion papers establish that this $\kappa$ is isomorphic to the credit hazard rate (Ahmed & Bhuyan, 2026a), that it forms a measurable riba-free term structure in real sovereign and corporate sukuk markets (Ahmed & Bhuyan, 2026b), and that it can organise the pricing of an entire Islamic financial system (Ahmed & Bhuyan, 2026d). The capstone explicitly leaves the monetary-base step—formalising money creation tied to real-sector convergence through $\kappa$—as future work. This paper undertakes it.

We construct the *$\kappa$-Standard*, a monetary architecture with four components, and establish their formal properties:

1. **Balance sheet** (Section 2). Base money equals the $\kappa$-priced value of a portfolio of sovereign

perpetual sukuk; money is sovereign equity backed one-to-one by the present value of real assets, not a debt liability.

2. **Debt-free seigniorage** (Section 3). New money is created only by monetising a new real-sector project at its $\kappa$-implied price; money growth is tethered to real-output growth.
3. **$\kappa$-OMO** (Section 4). Open-market operations transmit through the system-wide $\bar{\kappa}$, not an interest rate. We derive the law of motion of the money supply and show that a $\bar{\kappa}$ shock contracts the base automatically. The central bank controls the *quantity* of money; the market sets the *price of capital* $\bar{\kappa}$, a quantity-policy regime loosely in the spirit of Wicksell.
4. **Full-reserve banking** (Section 5). Commercial banks hold one hundred per cent reserves and split into fee-based custody (*ujrah*) and profit-sharing investment (*mudarabah*); the money multiplier is one, so demand-deposit runs are precluded within the model, while investment-pool losses are borne as equity, not abolished.

Section 6 confronts the architecture's central hazard—the procyclical contraction of Corollary 4.4—with a countercyclical issuance rule, and is honest about its bounded reach. Section 7 addresses the question a monetary-economics reader will press hardest—whether the price level is determinate at all—and shows that, because the backing is real equity and policy is a quantity operation, the system escapes real-bills indeterminacy and pins a unique price level under the fiscal theory of the price level, the natural determinacy closure for a system with no interest-rate instrument (Theorem 7.2). Section 9 states the remaining boundaries: the $\kappa$-Standard removes debt-financed and unbacked money creation, its price-level determinacy is established under a fiscal closure here and shown to survive full general equilibrium in the companion paper (Ahmed & Bhuyan, 2026e), its stabilisation is bounded by real-capacity backing, and it is a monetary *architecture*—like the Chicago Plan—whose pricing primitive's empirical reality is carried by the companion papers, not re-established here. Section 10 concludes.

## 2 The $\kappa$-Standard Balance Sheet

We work on a filtered probability space $(\Omega, \mathcal{F}, \{\mathcal{F}_t\}, \mathbb{Q})$ satisfying the usual conditions, with $\mathbb{Q}$ the risk-neutral (pricing) measure of Ackerer et al. (2025) at $\iota = 0$.

**Definition 2.1** (Sovereign perpetual sukuk)**.** A *sovereign perpetual sukuk* indexed by $i$ is a tokenised claim on a real productive asset (an infrastructure project, energy grid, or state commodity reserve) with value process $X_t^{(i)}$. Its riba-free price at $\iota = 0$ is

$$P_t^{(i)} \;=\; \mathbb{E}_t^{\mathbb{Q}}\Big[X_{\tau_i}^{(i)}\Big], \qquad \tau_i \sim t + \mathrm{Exp}\big(\kappa^{(i)}\big), \tag{1}$$

where $\kappa^{(i)} \geq 0$ is the asset's convergence intensity and $\tau_i$ is its (credit/completion) stopping time, independent of $X^{(i)}$ under $\mathbb{Q}$.

Equation (1) is the riba-free pricing primitive; it is not, by itself, the object the central bank holds. If $X^{(i)}$ is a $\mathbb{Q}$-martingale and $\tau_i$ is independent of it, optional sampling gives $P_t^{(i)} = X_t^{(i)}$ *independently of* $\kappa^{(i)}$: a pure, at-par, no-credit claim. To obtain an asset whose price responds to $\kappa$—which the policy mechanism of Section 4 requires—we take the credit-bearing claim of the companion papers, in which default/resolution carries recovery $\delta_i \in [0, 1)$. There the convergence intensity is identified with the credit hazard (Ahmed & Bhuyan, 2026a,b) as a *reduced-form* Duffie–Singleton survival valuation (Duffie & Singleton, 1999) (a modelling choice, not a theorem we re-derive from (1)), giving the spread $s_i = \kappa^{(i)}(1 - \delta_i)$ and the *constant-maturity* price

$$P_t^{(i)} \;=\; \mathcal{P}_i\, e^{-\kappa_t^{(i)}(1-\delta_i)\,T_i}, \tag{2}$$

where $\mathcal{P}_i$ is par value and $T_i$ is a *fixed reference tenor*. We assume throughout that the central bank runs a *constant-maturity book*—its sukuk holdings are continuously rolled at target tenors

$T_i$ (e.g. seven years), exactly the constant-maturity construction estimated in Ahmed & Bhuyan (2026b)—so that $T_i$ is constant, the price is a function of the convergence intensity alone, and there is no maturity-decay term to carry through the dynamics. The structural fact we use repeatedly is

$$\frac{\partial P_t^{(i)}}{\partial \kappa_t^{(i)}} \;=\; -(1-\delta_i)\,T_i\,P_t^{(i)} \;<\; 0: \tag{3}$$

the price of a credit-bearing constant-maturity sukuk is strictly decreasing in its convergence intensity, with a sensitivity equal to its credit-loss-weighted duration $(1-\delta_i)T_i$. (At $\delta_i \to 1$ this collapses to the at-par limit $P = \mathcal{P}$, the no-credit analogue of the martingale case $P = X$, independent of $\kappa$; such claims cannot transmit $\kappa$-OMO and are excluded from the policy portfolio—Remark 9.1.)

**Definition 2.2** (The Islamic Central Bank balance sheet)**.** The Islamic Central Bank (ICB) holds $N_i \geq 0$ units of each sovereign perpetual sukuk and no interest-bearing instrument. Its monetary liabilities—the base money supply $M_t$ in circulation plus bank reserves—equal its assets:

$$\boxed{M_t \;=\; \sum_{i=1}^{n} N_i\,P_t^{(i)} \;=\; \sum_{i=1}^{n} N_i\,\mathbb{E}_t^{\mathbb{Q}}[X_{\tau_i}^{(i)}].} \tag{4}$$

Equation (4) is an accounting identity (assets equal liabilities), but its economic content is the substitution of the asset side. In the fiat system the central bank's assets are interest-bearing government bonds, and base money is the matching debt liability. Under the $\kappa$-Standard the asset side is composed entirely of $\kappa$-priced claims on real output, so base money is the present value of sovereign *equity*. The asset class this presupposes already exists at monetary scale: as of 31 May 2026 the global sukuk market stood at USD 761.3 billion outstanding across 4,701 issues, of which USD 277.3 billion was internationally placed.[2] A market of this size is large enough for benchmark construction at the sovereign tier, though depth is concentrated (USD 277.3 bn internationally placed) and the scarcity of high-quality sovereign sukuk remains the binding operational constraint (Section 4).

**Proposition 2.1** (Money as fully-backed sovereign equity)**.** *Under Definition 2.2, every unit of base money is backed one-to-one by the risk-neutral present value of a real productive asset, and the ICB cannot expand $M_t$ except by acquiring a claim of equal $\kappa$-implied present value. In particular there exists no monetary liability of the ICB without a real-asset counterpart of equal value; money creation unbacked by real output is precluded within the model.*

*Proof.* Immediate from (4): $M_t$ is defined as the sum of the present values $P_t^{(i)}$ of held assets. Any increase $\Delta M_t$ requires $\Delta \sum_i N_i P_t^{(i)} > 0$, i.e. the acquisition of additional units $\Delta N_i$ of an asset priced at $P_t^{(i)}$, of present value $\sum_i \Delta N_i P_t^{(i)} = \Delta M_t$. No accounting entry increases the left side without an equal increase of the right. □ □

Proposition 2.1 is the formal counterpart of the Chicago-Plan and Al-Jarhi claim that money can be issued as equity rather than debt. The idea that base money is best understood as an equity-like residual claim on the issuer's cash flows rather than as a redeemable debt has a Western lineage that the $\kappa$-Standard makes literal: Buiter (2007) treats irredeemable base money as "an asset of the holder but not a liability of the issuer," and Hall & Reis (2015) show that it is the seigniorage franchise—a flow of real resources—not paid-in capital that backs a central bank's liabilities and keeps it solvent. The $\kappa$-Standard replaces that implicit franchise with an explicit portfolio of $\kappa$-priced sovereign claims. We stress in Section 9 that "fully backed" is a statement about the *asset side*, not a guarantee about the price level.

[2] Cbonds, `cbonds.com/sukuk` (retrieved 4 June 2026); the outstanding total rose from USD 741.1 billion a month earlier.

# 3 Debt-Free Seigniorage: Money Creation Tied to Real Output

How does a sovereign fund a new \$5 billion high-speed rail without issuing an interest-bearing bond? Under the $\kappa$-Standard the creation of new money is a three-step monetisation of new real capacity.

**Definition 3.1** ($\kappa$-monetisation)**.** To finance a new real-sector project of par value $\mathcal{P}_*$ and effective horizon $T_*$:

1. **Issuance.** The Treasury issues a new sovereign perpetual sukuk against the project's future output, with value process $X^{(*)}$.
2. **Calibration.** The open market assigns a convergence intensity $\kappa^{(*)}$ to the project from its completion and revenue risk, yielding the price $P^{(*)} = \mathcal{P}_* \, D(\kappa^{(*)}, T_*)$ of (2).
3. **Monetisation.** The ICB purchases the sukuk from the Treasury and credits the Treasury's account with newly created base money $\Delta M = P^{(*)}$.

The created money is exactly the market's $\kappa$-implied present value of the new real asset—no more, no less. This yields the Chapra tether as an identity rather than a policy aspiration.

**Proposition 3.1** (Real-output tether)**.** *Under $\kappa$-monetisation, the issuance component of base-money growth equals the $\kappa$-priced value of newly monetised real capacity:*

$$\Delta M_t^{\text{iss}} \;=\; \sum_{*\,\in\,\mathcal{I}_t} \mathcal{P}_* \, D\big(\kappa^{(*)}, T_*\big), \tag{5}$$

*where $\mathcal{I}_t$ is the set of projects monetised in $[t, t + \mathrm{d}t]$. The money supply expands only as real productive capacity is created and priced; in the absence of new real projects, $\Delta M_t^{\text{iss}} = 0$.*

*Proof.* Sum the per-project creations $\Delta M = P^{(*)}$ of Definition 3.1 over $\mathcal{I}_t$ and substitute (2).
□ □

Equation (5) is the issuance (real-output) channel of money growth. It is distinct from, and additive to, the revaluation channel of Section 4, which moves the value of the *existing* stock as convergence intensities move. We keep the two channels separate throughout: new money tracks new real output; the standing money base revalues with $\kappa$.

**Seigniorage socialisation.** The arrangement is not merely interest-free; it relocates the seigniorage from money creation onto the public balance sheet. In a fractional-reserve system the bulk of the money stock is privately created: commercial banks originate broad money when they lend, so that deposits—not state-issued cash—constitute the overwhelming majority of the circulating medium (McLeay et al., 2014; Werner, 2014), on the order of 95% in mature economies (Dyson et al., 2016). The rent from that creation—the spread between the near-zero cost of issuing a redeemable-at-par deposit and the return on the assets it funds—accrues to the issuing banks rather than to the public. Under the $\kappa$-Standard, by construction, the demand-deposit silo is 100% reserved and creates no money (Proposition 5.1); *all* new money enters through the $\kappa$-monetisation of Definition 3.1, so the issuance gain $\Delta M^{\text{iss}}$ of (5) is captured by the issuer and, through it, the public treasury rather than by private intermediaries. This is the same transfer that motivates the Chicago-Plan and sovereign-money proposals (Fisher, 1936; Benes & Kumhof, 2012; Dyson et al., 2016) and that Buiter (2007) formalises as the central bank's monopoly seigniorage; the $\kappa$-Standard's contribution is to tie the size of that public seigniorage to priced real output via (5) rather than to a discretionary monetary-base target. The distributional counterpart of this socialisation—who receives newly issued money first—is treated in Section 8.

# 4 $\kappa$-Space Open-Market Operations and the Law of Motion of Money

A central bank that cannot set a risk-free interest rate needs a different steering mechanism. Under the $\kappa$-Standard the instrument is the open-market purchase and sale of sovereign sukuk, and the transmission variable is the system-wide convergence intensity $\bar{\kappa}$.

## 4.1 The transmission mechanism

We treat $\kappa_t^{(i)}$ as the *market-clearing* convergence intensity that prices the instrument through (2)—the value implied by the price at which float is held—not a frozen fundamental. Let private demand for the float of sukuk $i$ be downward-sloping in its price (equivalently, upward-sloping in $\kappa^{(i)}$), as for any traded credit instrument.

**Proposition 4.1** ($\kappa$-OMO transmission)**.** *Under a downward-sloping demand for float, an ICB purchase $\Delta N_i > 0$ (financed by newly created base money $\Delta M = \Delta N_i P_t^{(i)} > 0$) reduces the private float that the market must hold and so clears at a higher price; by (2) the market-clearing convergence intensity falls,*

$$\Delta M > 0 \implies \Delta P_t^{(i)} > 0 \implies \Delta \kappa_t^{(i)} < 0, \tag{6}$$

*with the magnitude governed by the demand elasticity. A sale reverses every sign.*

*Proof.* $\Delta M = \Delta N_i P_t^{(i)} > 0$ by construction. Removing $\Delta N_i$ from private float shifts the residual supply curve left; under downward-sloping demand the market clears at a higher price, $\Delta P_t^{(i)} > 0$; by (2), $\Delta \kappa_t^{(i)} < 0$. □ □

Operationally this is a *quantity* operation—the instrument is $\Delta M$, the implied $\kappa$-move is its endogenous by-product on the priced float—and it is therefore close in mechanics to conventional quantitative easing. The differences are in the *asset* and the *signal*, not the operation: the asset is a real-backed, riba-free sukuk rather than interest-bearing debt, and the policy stance is read off the market-clearing $\kappa$ rather than off an administered interest rate. We do not claim a novel transmission channel to investment or broad credit; establishing how $\kappa$-OMO propagates beyond the priced instruments to aggregate demand is a general-equilibrium question we leave open (Section 9). What Proposition 4.1 establishes is only the sign and the riba-free form of the operation. Nor is interest-free liquidity management merely hypothetical: Bank Negara Malaysia already conducts injection and absorption without an interest rate through *qard* acceptance, *wadiah* placements, and sukuk-based notes, and the operational constraints of such a regime—above all the scarcity of high-quality sovereign sukuk—are documented by El Hamiani Khatat (2016). The $\kappa$-Standard supplies the missing object those operations price against: a market-clearing convergence intensity rather than an administered profit rate.

**Corollary 4.2** (Quantity, not price, is the instrument)**.** *The central bank controls the* quantity *of base money it injects; the* price of capital $\bar{\kappa}$ *is determined by the market and cannot be pegged by policy. This shares one feature with Wicksell's natural rate—it is exogenous to the policy instrument—and the analogy is limited to that feature. We do* not *claim* $\bar{\kappa}$ *is* the natural rate of interest*: Wicksell's natural rate is a real intertemporal price (the marginal product of capital) that is well defined even in a default-free economy, whereas $\bar{\kappa}$ is a credit-hazard intensity that, by Remark 9.1, vanishes precisely in the default-free limit. A real-side shock can move the natural rate without moving $\bar{\kappa}$, and a pure credit shock can move $\bar{\kappa}$ without moving the natural rate; the two are distinct objects. The point we do make is structural and weaker: whereas Woodford (2003) organises policy around managing a short-term* interest rate*, the $\kappa$-Standard organises it around managing the money* quantity*, with no interest instrument anywhere in the transmission.*

### 4.2 The law of motion of the money supply

Let each convergence intensity follow the Cox–Ingersoll–Ross dynamics established for $\kappa$ in the companion programme,

$$\mathrm{d}\kappa_t^{(i)} \;=\; \alpha_i\big(\bar{\kappa}^{(i)} - \kappa_t^{(i)}\big)\,\mathrm{d}t \;+\; \nu_i\sqrt{\kappa_t^{(i)}}\;\mathrm{d}W_t^{(i)}, \tag{7}$$

with $\alpha_i > 0$ the mean-reversion speed, $\bar{\kappa}^{(i)} > 0$ the long-run mean, $\nu_i > 0$ the volatility, and $W^{(i)}$ standard Brownian motions. Write $\beta_i \equiv (1-\delta_i)T_i$ for the credit-loss-weighted duration of (3). Because the book is constant-maturity ($T_i$ fixed), $P_t^{(i)}$ depends on $t$ only through $\kappa_t^{(i)}$, so Itô's lemma applied to $P_t^{(i)} = \mathcal{P}_i e^{-\beta_i\kappa_t^{(i)}}$ has no maturity-decay term and gives, exactly,

$$\frac{\mathrm{d}P_t^{(i)}}{P_t^{(i)}} = -\beta_i\;\mathrm{d}\kappa_t^{(i)} + \tfrac{1}{2}\beta_i^2\nu_i^2\kappa_t^{(i)}\;\mathrm{d}t. \tag{8}$$

Summing the revaluation of the standing portfolio gives the law of motion of the base.

**Theorem 4.3** (Money-supply dynamics under the $\kappa$-Standard)**.** *With the balance sheet (4), constant-maturity prices (2), and dynamics (7), and writing $\beta_i = (1-\delta_i)T_i$, the standing money base evolves as*

$$\begin{aligned}\mathrm{d}M_t \;=\; &\underbrace{\sum_i N_i P_t^{(i)}\Big[\,\beta_i\alpha_i\big(\kappa_t^{(i)} - \bar{\kappa}^{(i)}\big) + \tfrac{1}{2}\beta_i^2\nu_i^2\kappa_t^{(i)}\,\Big]\,\mathrm{d}t}_{\textit{revaluation drift}} \\ &-\underbrace{\sum_i N_i P_t^{(i)}\,\beta_i\,\nu_i\sqrt{\kappa_t^{(i)}}\;\mathrm{d}W_t^{(i)}}_{\textit{revaluation diffusion}} \;+\; \underbrace{\mathrm{d}M_t^{\mathrm{iss}}}_{\textit{new issuance}}\;.\end{aligned} \tag{9}$$

*The issuance term $\mathrm{d}M_t^{\mathrm{iss}} = \sum_{*\in\mathcal{I}_t} P^{(*)}\,\mathrm{d}N_*$ is a pure-jump process (Proposition 3.1); when projects arrive as a finite-intensity point process its compensator defines the finite issuance rate $\varphi_t = \mathbb{E}_t[\,\mathrm{d}M_t^{\mathrm{iss}}]/\,\mathrm{d}t$ used below — a money-creation* flow.

*Proof.* Differentiate (4): $\mathrm{d}M_t \;=\; \sum_i N_i\;\mathrm{d}P_t^{(i)} \;+\; \mathrm{d}M_t^{\mathrm{iss}}$, the last term collecting changes in holdings $\mathrm{d}N_i$ from new monetisation. Substitute $\mathrm{d}P_t^{(i)}/P_t^{(i)}$ above and (7). □ □

The single most important comparative-static of the architecture follows by differentiating the revaluation drift in the long-run mean.

**Corollary 4.4** (Automatic contraction under a credit-deterioration shock)**.** *A uniform upward shock to the system-wide long-run convergence intensity, $\bar{\kappa}^{(i)} \mapsto \bar{\kappa}^{(i)} + \Delta\bar{\kappa}$ for all $i$, contracts the standing money base: holding the current $\kappa_t^{(i)}$ fixed,*

$$\frac{\partial\,(\mathbb{E}_t[\,\mathrm{d}M_t]/\,\mathrm{d}t)}{\partial\bar{\kappa}} \;=\; -\sum_i N_i P_t^{(i)}\,\beta_i\,\alpha_i \;<\; 0, \qquad \beta_i = (1-\delta_i)T_i. \tag{10}$$

*A system-wide credit deterioration—widening $\bar{\kappa}$—automatically shrinks the money supply as intensities mean-revert toward the higher target and prices fall.*

*Proof.* Differentiate the revaluation-drift term of (9) with respect to $\bar{\kappa}^{(i)}$; only the $-\beta_i\alpha_i\bar{\kappa}^{(i)}$ piece depends on it, giving $-N_i P_t^{(i)}\beta_i\alpha_i$ per asset. Sum over $i$. □ □

Corollary 4.4 is the $\kappa$-Standard's built-in quantity rule: the base expands only as real output is monetised (Proposition 3.1) and contracts automatically when the sovereign asset portfolio's convergence deteriorates. Whether this automatic contraction stabilises or destabilises is not self-evident, and we confront it as the architecture's central hazard in Section 6, where a countercyclical issuance rule neutralises it within the limits of the backing.

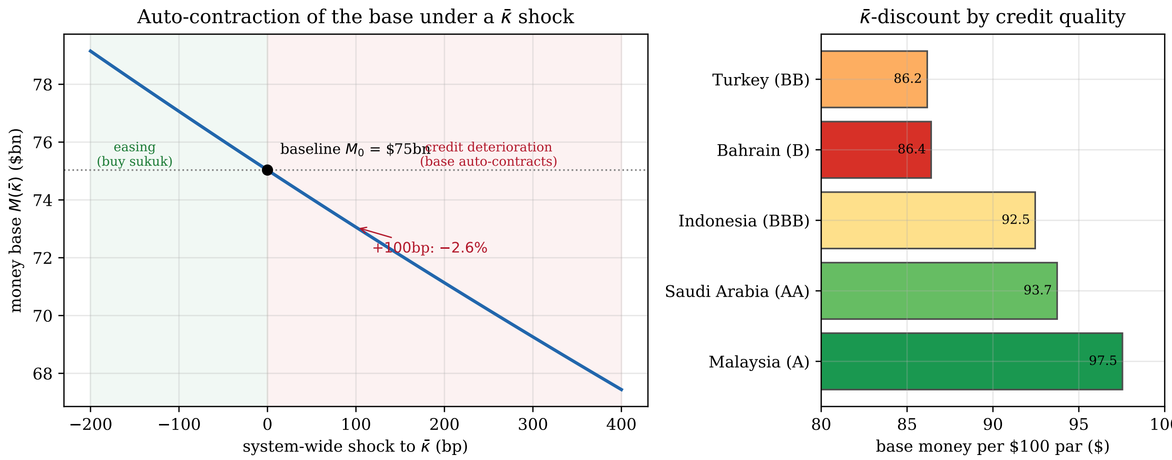


Figure 1: The $\kappa$-Standard money base, calibrated to real sovereign-sukuk $\bar{\kappa}$ (Ahmed & Bhuyan, 2026b), $\delta = 0.60$, $P = \mathcal{P}\, e^{-\kappa(1-\delta)T}$. *Left:* the base $M(\bar{\kappa}) = \sum_i \mathcal{P}_i e^{-(\bar{\kappa}_i + \Delta\bar{\kappa})(1-\delta)T_i}$ for the real outstanding-weighted portfolio ($82.3 bn par, Cbonds). Easing (open-market purchases) lowers $\bar{\kappa}$ and raises $M$; a system-wide credit deterioration raises $\bar{\kappa}$ and contracts the base automatically (+100 bp $\Rightarrow$ −2.6%). *Right:* base money created per $100 of par by sovereign—the $\bar{\kappa}$-discount—falling with credit quality from $97.5 (Malaysia, A) to $86.4 (Bahrain, B).

### 4.3 A worked example, calibrated to real sukuk data

To make the mechanism concrete we calibrate it with the *real* long-run convergence intensities estimated on sovereign sukuk in Ahmed & Bhuyan (2026b), using the closed-form spread discount their identification implies, $P = \mathcal{P}\, e^{-\kappa(1-\delta)T}$ with $\delta = 0.60$.

**Debt-free seigniorage of a single project.** Suppose the Indonesian Treasury (real 7-year $\bar{\kappa} = 2.80\%$) monetises a $5 bn infrastructure project of horizon $T = 7$ years. The implied spread is $s = \kappa(1-\delta) = 112$ bp—of the same order as Indonesia's recent 7-year sovereign sukuk G-spread—so the $\kappa$-discount is $D = e^{-sT} = 0.925$ and the central bank creates

$$\Delta M \;=\; \mathcal{P}_* D \;=\; \$5\text{bn} \times 0.925 \;=\; \$4.62\text{bn}$$

of new base money against the project. The $0.38 bn gap between par and money created is the convergence/credit discount, not interest: the state funds real capacity debt-free, and the base expands by exactly the market's $\kappa$-implied present value of new output (Proposition 3.1).

**Portfolio revaluation and the $\bar{\kappa}$ shock.** Consider an Islamic Central Bank holding the five sovereigns' *actual* outstanding international USD sukuk (Malaysia $2.5 bn, Saudi Arabia $30.0 bn, Indonesia $24.4 bn, Türkiye $14.2 bn, Bahrain $11.2 bn — $82.3 bn par in total, real Cbonds volumes), priced at their real $\bar{\kappa}$ (Malaysia, Saudi, Indonesia, Bahrain at 7y; Türkiye at 5y). The baseline money base is $M_0 = \$75.0$ bn. Figure 1 traces $M(\bar{\kappa})$ as every issuer's $\bar{\kappa}$ is shocked uniformly: a +100 bp system-wide credit deterioration contracts the base by **2.6%** (to $73.1 bn; base semi-elasticity $\partial \ln M/\partial\bar{\kappa} \approx -2.67\%$ per 100 bp), exactly the automatic contraction of Corollary 4.4. The contraction is, to first order, a *duration* effect—$\partial \ln P/\partial\kappa = -(1-\delta)T$, so all same-maturity issuers contract identically (the 7-year sovereigns by $\approx 2.8\%$, the 5-year Türkiye by $\approx 2.0\%$) regardless of credit level; the credit level instead sets how much money each dollar of par backs at baseline (right panel: $97.5 for single-A Malaysia down to $86.2 for Türkiye at its 5-year tenor — below single-B Bahrain's $86.4 despite the shorter tenor, because Türkiye's higher $\bar{\kappa}$ dominates).

| Segment | $n$ | par outstanding ($bn) | $\kappa$-base $M$ ($bn) |
|---|---|---|---|
| Sovereign | 40 | 59.6 | 57.0 |
| Corporate | 154 | 134.6 | 127.9 |
| Municipal | 1 | 1.0 | 0.9 |
| Full universe | 195 | 195.2 | 185.8 |

Table 1: The $\kappa$-Standard money base computed on the *full* real outstanding USD sukuk universe for which Cbonds reports an amount, a $G$-spread and a maturity (195 instruments: 40 sovereign, 154 corporate, one municipal; account 972307). The base is the $\kappa$-priced value of the asset class, $M = \sum_i N_i e^{-\kappa_i(1-\delta)T_i}$ = \$185.8 bn on \$195.2 bn of par. A uniform +100 bp shock to every issuer's $\kappa$ contracts the base by 1.96% (semi-elasticity $\partial \ln M/\partial\bar{\kappa} \approx -1.99\%$ per 100 bp) — smaller than the seven-year basket because the broader universe is shorter-duration. $\delta = 0.60$.

Two cautions on reading Figure 1. First, it is a *comparative static*—the steady-state revaluation of the base as each $\bar{\kappa}$ is reset to a new level $\bar{\kappa} + \Delta\bar{\kappa}$ and the book re-priced—not a simulation of the full stochastic dynamics of Theorem 4.3. It shows the deterministic revaluation (drift) channel; it suppresses the diffusion term, so the realised base along any path carries volatility around this curve, and the curve should be read as the conditional mean response, not a deterministic trajectory. Second, it is an architectural illustration, not a claim about any actual central bank's portfolio; its only purpose is to show that the law of motion of Theorem 4.3 produces economically sensible magnitudes when fed the $\kappa$ values that real sukuk markets actually exhibit.

**The base on the full actively-quoted USD-sukuk cross-section.** The five-issuer basket is illustrative; the architecture, however, applies to the entire asset class. Table 1 computes the base $M = \sum_i N_i e^{-\kappa_i(1-\delta)T_i}$ directly on *every* actively-quoted USD sukuk for which Cbonds reports an outstanding amount, a $G$-spread and a maturity — 195 instruments (40 sovereign, 154 corporate, 1 municipal), \$195.2 bn of par. The $\kappa$-priced base is \$185.8 bn, and a uniform +100 bp shock to every issuer's $\kappa$ contracts it by 1.96% (semi-elasticity $\approx -1.99\%$ per 100 bp). The semi-elasticity is smaller than the seven-year basket's −2.67% because the broader universe is shorter-duration: the same portfolio-duration mechanism ($\partial \ln M/\partial\kappa = -(1-\delta)\,\bar{T}$ in aggregate), now read off the whole traded market rather than a representative basket.

**The base as a realised series.** The auto-contraction need not stay hypothetical. Figure 2 traces the base the architecture *would* have produced month by month, fed the five core sovereigns' *actual realised* constant-maturity $\kappa$ (Cbonds daily $G$-spreads, rolled to a fixed 7-year tenor) and their real outstanding volumes (\$82.3 bn par). Over the five-issuer overlap window (2022–2026) the base swings from \$71.7 bn at peak credit stress to \$76.5 bn at the tightest spreads — a 6.3% peak-to-trough move driven *purely by credit*, with no change in the quantity of outstanding sukuk. This is the law of motion of Theorem 4.3 read off the historical record rather than a comparative static: a $\kappa$-Standard base automatically absorbs credit cycles, contracting as spreads widen and expanding as they compress, exactly the countercyclical-on-price behaviour the stabilisation issuance rule (Section 6) is designed to bound.

# 5 The Full-Reserve Banking Layer

For the balance-sheet identity (4) to bind, commercial banks must not be permitted to create money by lending against deposits—the fractional-reserve channel that both Fisher (1936) and Chapra (1985) reject and that Werner (2014) documents empirically. Under the $\kappa$-Standard banks split into two rigid, interest-free silos.

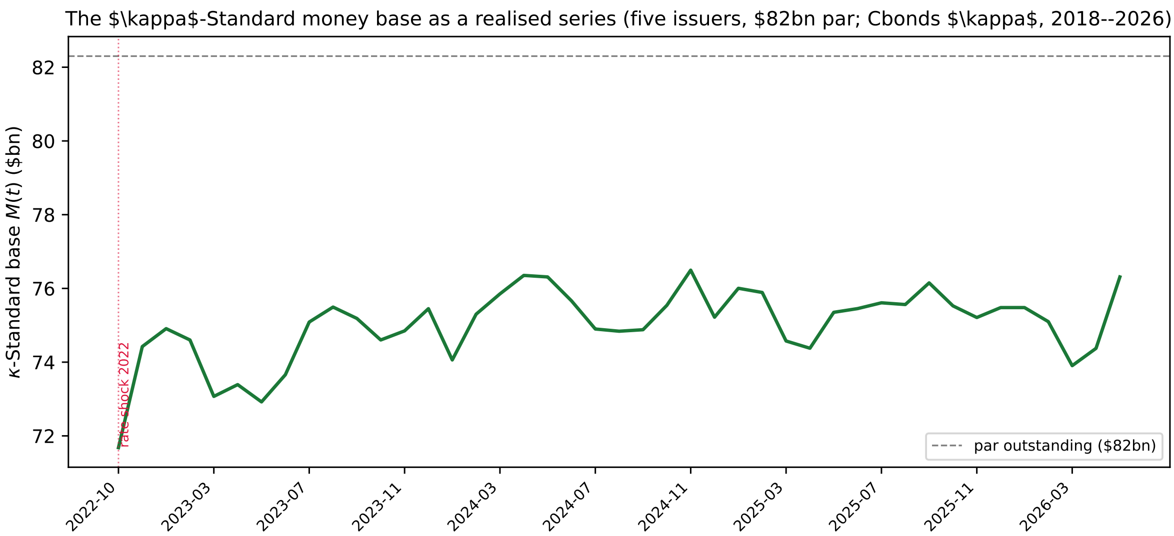


Figure 2: The $\kappa$-Standard money base as a *realised* series, not a comparative static: $M(t) = \sum_i N_i e^{-\kappa_i(t)(1-\delta)T}$ with $N_i$ the real outstanding USD-sukuk volume per issuer and $\kappa_i(t)$ the real constant-maturity $\kappa$ (Cbonds, $\delta = 0.60$; rolled to a fixed tenor — 7 y where quoted, with Türkiye's series its 5 y constant-maturity $\kappa$). Five core sovereigns, \$82.3 bn par, over their common quoting window. The base falls as credit deteriorates and recovers as spreads compress — a 6.3% swing from credit alone.

**Definition 5.1** (Two-silo full-reserve bank)**.** A commercial bank offers exactly two account types.

1. **Demand deposits (custody, 100% reserve).** Balances are held one-for-one in base money $M$ and are never lent. The bank charges a flat, transparent service fee (*ujrah*) for safekeeping and payment processing. No money is created.
2. **Investment accounts (*mudarabah* pools).** Capital seeking a return is pooled and deployed by the bank, as agent, into $\kappa$-priced credit instruments (corporate sukuk, the Islamic credit default swap of Ahmed & Bhuyan (2026c)). Returns float with the realised convergence intensity of the holdings; principal is not guaranteed and bears equity (profit-and-loss-sharing) risk.

**Proposition 5.1** (Unit money multiplier and run-freeness)**.** *Under Definition 5.1 the money multiplier is one—total money equals the base $M_t$ of (4), with no bank-created inside money—and the system is free of par-redemption (demand-deposit) runs: demand deposits are fully reserved and therefore always redeemable, while investment pools are floating-value equity claims that carry no redeemable-at-par promise and so admit no discontinuous par run.*

*Proof.* Demand deposits are 100% reserved, so they create no money beyond the base they hold; investment pools transfer existing base money into asset purchases without creating deposits. Hence total money $= M_t$ and the multiplier is unity. Demand deposits are redeemable on demand from full reserves, eliminating the maturity-mismatch that generates runs; investment pools have no par-redemption promise, so adverse information triggers price adjustment, not a run (Cochrane, 2014). □ □

The model eliminates the *demand-deposit* run—the classic maturity-mismatch panic—by full reserving. It does not abolish all run-like dynamics: a floating-NAV pool facing correlated redemptions can still force asset sales into a falling market, and if pool units are made redeemable intraday a slow-motion first-mover advantage can re-emerge through fire-sale price impact

(Borio, 2014). What the structure removes is the *par* promise that converts such pressure into a discontinuous run; the residual risk is mitigated and made explicit as equity loss, not contractually denied.

The two-silo structure realises, in an interest-free form, the run-free system of Cochrane (2014), the narrow-banking design surveyed by Pennacchi (2012), and the money/credit separation of Fisher (1936) and Benes & Kumhof (2012): money is state-issued equity; credit is intermediated only through risk-sharing pools that buy $\kappa$-priced instruments. The standard objection—that full reserving starves the economy of credit—does not bind here: as Brunnermeier & Niepelt (2019) show, a shift from private deposits to public money is allocation-neutral when the issuer recycles the funds to intermediaries, which is exactly what the *mudarabah* pools do when they purchase $\kappa$-priced sovereign and corporate claims.

**What the full-reserve literature predicts—and what it does not yet show.** The case for separating money from credit is not merely structural; it has been quantified. In the IMF DSGE evaluation of the Chicago Plan, Benes & Kumhof (2012) report that moving a fractional-reserve economy to 100% reserves (i) eliminates bank runs by construction, (ii) sharply reduces both public and private debt, since money no longer has to be borrowed into existence, (iii) smooths the business cycle by removing the pro-cyclical bank-money multiplier that Werner (2014) and Jakab & Kumhof (2015) document, and (iv) delivers a steady-state output gain on the order of 10% in their calibration, with inflation able to fall to zero without deflationary debt spirals. The sovereign-money programme of Dyson et al. (2016) reaches the same qualitative conclusions from an institutional rather than a model-based standpoint. We import these as the *theoretical* case for the $\kappa$-Standard's banking layer and are deliberate about their epistemic status: unlike the debt-money critique of Section 1, which rests on realised central-bank and BIS evidence, the Chicago-Plan gains are *model-supported*, not historically observed—no economy has run a full-reserve regime at scale in the modern era. The $\kappa$-Standard inherits both the promise and that evidentiary gap; what it adds is a concrete interest-free pricing kernel ($\kappa$, not $r$) under which the money/credit separation can actually be implemented, rather than a reserve mandate left to sit on top of an interest-based system.

# 6 Stabilisation: a Countercyclical Issuance Rule

Corollary 4.4 exposes the architecture's central hazard. The standing money base contracts automatically when the system-wide convergence intensity $\bar{\kappa}$ widens, and $\bar{\kappa}$ widens precisely in a credit downturn—so the revaluation channel tightens money exactly when the economy weakens. This is the procyclicality that Borio (2014) identifies as the core danger of any asset-linked monetary aggregate. A monetary standard that did nothing about it would be inferior to discretionary fiat. We show the $\kappa$-Standard does not have to leave it unaddressed: the second channel of Theorem 4.3— new issuance—is a policy lever that can be run countercyclically against the first.

## 6.1 Decomposition and the neutralising rule

Write the expected base-growth rate from Theorem 4.3 as the sum of a market-driven revaluation drift and a policy-driven issuance flow:

$$\frac{\mathbb{E}_t[\,\mathrm{d}M_t]}{\mathrm{d}t} = \underbrace{D_t^{\mathrm{rev}}}_{\text{market}} + \underbrace{\varphi_t}_{\text{policy}}, \qquad D_t^{\mathrm{rev}} = \sum_i N_i P_t^{(i)} \Big[\beta_i \alpha_i \big(\kappa_t^{(i)} - \bar{\kappa}^{(i)}\big) + \tfrac{1}{2}\beta_i^2 \nu_i^2 \kappa_t^{(i)}\Big], \tag{11}$$

where $\varphi_t = \mathbb{E}_t[\,\mathrm{d}M_t^{\mathrm{iss}}]/\,\mathrm{d}t$ is the rate at which the Treasury monetises new real capacity (Proposition 3.1). The revaluation drift $D_t^{\mathrm{rev}}$ carries the procyclical contraction of Corollary 4.4; the issuance flow $\varphi_t$ is chosen by policy.

**Proposition 6.1** (Countercyclical drift neutralisation, when feasible)**.** *Fix a target base-growth rate $g \geq 0$. Whenever the required issuance flow is feasible, $\iota_t^* \in [-S_t, K_t]$ (Section 6.2), the rule*

$$\iota_t^* \;=\; g\, M_t \;-\; D_t^{\mathrm{rev}} \tag{12}$$

*sets the* conditional drift *of the base to the target, $\mathbb{E}_t[\,\mathrm{d}M_t]/\,\mathrm{d}t = g\, M_t$, for every realisation of the convergence intensities. The procyclical revaluation drift is offset by countercyclical monetisation: a credit deterioration ($D_t^{\mathrm{rev}} < 0$) calls for more issuance, a boom ($D_t^{\mathrm{rev}} > 0$) for less.*

*Proof.* Substitute (12) into (11): $\mathbb{E}_t[\,\mathrm{d}M_t]/\,\mathrm{d}t = D_t^{\mathrm{rev}} + (gM_t - D_t^{\mathrm{rev}}) = gM_t$. □ □

Two caveats are essential. First, the rule neutralises only the *drift*: the revaluation *diffusion* $-\sum_i N_i P_t^{(i)} \beta_i \nu_i \sqrt{\kappa_t^{(i)}}\, \mathrm{d}W_t^{(i)}$ of Theorem 4.3 is untouched, so the base is held on a target path only in conditional expectation; its instantaneous variance, driven by credit-spread noise, remains. A monetary aggregate that fluctuates with $\mathrm{d}W$ is itself a concern we flag in Section 9. Second, $\iota_t^*$ is not a free control: it is the rate of *real-project monetisation* (Proposition 3.1) and is bounded by the backing constraint of Section 6.2, outside which the neutralisation is only partial. The rule is therefore a feasibility statement, not an unconditional guarantee. What it does cleanly is stabilise the *quantity* of money in expectation; it does not, and by Corollary 4.2 cannot, peg the *price of capital* $\bar{\kappa}$, which remains market-determined.

## 6.2 The backing constraint and the Sovereign Stabilisation Fund

The rule (12) is not unconstrained, and the constraint is exactly the discipline that defines the standard. By Proposition 2.1 every unit of issuance must be backed one-to-one by a real asset, so $\iota_t^*$ is feasible only within

$$\iota_t^* \in [\,-S_t,\ K_t\,], \tag{13}$$

where $K_t$ is the present value of new real capacity available to monetise (the expansionary limit) and $S_t$ is the inventory the state can sell or retire (the contractionary limit). In a severe stress, $D_t^{\mathrm{rev}}$ may be so negative that $\iota_t^* = gM_t - D_t^{\mathrm{rev}}$ exceeds $K_t$: there are not enough shovel-ready projects to monetise fast enough, and the neutralisation is only partial.

This is what the *Sovereign Stabilisation Fund* (SSF) exists to bridge. The SSF is a pre-funded, fully-backed buffer of sovereign sukuk. In booms ($\bar{\kappa}$ compressing, $D_t^{\mathrm{rev}} > 0$) it accumulates, absorbing the over-expansion; in busts it deploys, conducting expansionary $\kappa$-OMO (Proposition 4.1)— buying sukuk to raise prices and lower $\bar{\kappa}$—and fast-tracking pre-approved real projects. The SSF makes $S_t$ and the speed of $K_t$ large enough to keep $\iota_t^*$ feasible across ordinary cycles, and it never breaks Proposition 2.1: its assets are real $\kappa$-priced sukuk, not unbacked claims.

To size it concretely, take the full real outstanding sukuk universe of Section 4.3 ($185.8 bn base): a +100 bp system-wide $\bar{\kappa}$ shock contracts it by ≈ $3.6 *bn*. Holding the base flat ($g = 0$) through that shock therefore requires roughly $3.6 bn of countercyclical monetisation or SSF deployment per 100 bp—a finite, budgetable quantity.

## 6.3 Bounded-but-backed versus unbounded-but-unbacked

This contrast between bounded backing and unbounded fiat is the heart of the matter. Conventional fiat stabilisation is *unbounded*: a central bank can always create more money, but each unit is a fresh debt or unbacked liability. The $\kappa$-Standard's stabilisation is *bounded*: it can lean against the revaluation contraction only as far as real capacity and the SSF allow, but every unit it creates is backed one-to-one by a real asset. The boundedness is not a defect relative to the standard's purpose; it *is* the purpose. Unbounded stabilisation is unbounded precisely because it is unbacked, and unbacked issuance is the failure mode—debt accumulation, inflation, moral hazard—the architecture exists to remove. The $\kappa$-Standard thus makes an explicit and deliberate trade: it surrenders the ability to stabilise without limit in exchange for the guarantee that it can never stabilise without backing. Whether a given economy prefers that trade is a policy choice; that the trade is now *statable and quantifiable*—roughly \$3.6 bn per 100 bp on the full actively-quoted USD-sukuk cross-section (\$195.2 bn par; it would scale to roughly \$15 bn per 100 bp if the full \$761 bn global class were monetised)—is the contribution.

We pause to note how this backing constraint maps onto emerging settlement infrastructure, then return to the architecture's central theoretical question — price-level determinacy — in Section 7.

### 6.4 Implementation on a tokenised unified ledger

Nothing in the $\kappa$-Standard requires distributed-ledger technology; it is a monetary architecture, not a protocol. But the architecture's two operationally demanding objects—a money base defined as a live portfolio of $\kappa$-priced sovereign sukuk (Definition 2.2), and a Sovereign Stabilisation Fund whose issuance authority $\iota_t^*$ must be checked against a backing constraint $[-S_t, K_t]$ in real time (Section 6.2)—map unusually cleanly onto the *unified-ledger* substrate that the BIS (2023) blueprint proposes for the next monetary system: central-bank money, tokenised sovereign claims, and commercial-bank money as programmable objects in a common settlement environment. We sketch the correspondence without overstating it.

**The base as tokenised sovereign claims.** Under (4) base money is $M_t = \sum_i N_i P_t^{(i)}$, the marked value of held sukuk. On a unified ledger each $N_i$ is a tokenised sovereign claim and $M_t$ is the ledger's running valuation of the ICB's asset partition—the backing of Proposition 2.1 becomes a *ledger invariant* rather than a periodic accounting reconciliation. Issuance $\Delta M = \Delta N_i P_t^{(i)}$ and the $\kappa$-OMO of Proposition 4.1 are atomic settlement operations (delivery of base money versus the sukuk token), which is exactly the atomic settlement the blueprint identifies as the ledger's advantage over today's sequential messaging.

**The SSF backing constraint as programmable money.** The countercyclical rule of Proposition 6.1 is feasible only inside $\iota_t^* \in [-S_t, K_t]$. On a programmable ledger that admissibility condition is a *smart-contract precondition* on the issuance transaction: the SSF's drawable buffer $S_t$ and the verified real-capacity headroom $K_t$ are on-ledger state, and a proposed $\iota_t^*$ that violates the bound simply does not settle. This is the technical content of "bounded-but-backed": the backing constraint is not a supervisory promise to be audited after the fact but a transaction-level invariant the substrate enforces—the programmability that Adrian & Mancini-Griffoli (2019) and BIS (2023) describe, used here to make *non-issuance* the default whenever backing is absent.

**The retail layer and what tokenisation does not buy.** A retail CBDC on the same ledger is the natural front end for the full-reserve deposits of Section 5: *ujrah* custody balances are central-bank liabilities held directly, and *mudarabah* pool units are tokenised floating-NAV equity claims whose prices update with the underlying $\kappa$-priced book—the unit money multiplier of Proposition 5.1 is then a ledger property, not a regulatory target. We are deliberately narrow about the gains. Tokenisation improves *settlement, transparency, and enforceability of the backing constraint*; it does *not* supply price-level determinacy (Section 9), it does not abolish the procyclicality of Corollary 4.4, and it does not make the SSF buffer larger. It changes how reliably the architecture's invariants hold, not whether the architecture is sound. The substrate is an implementation convenience aligned with where wholesale infrastructure is already heading (Auer et al., 2023; BIS, 2023), not a premise of the result. Operationally, the same $\kappa$-pricing and tokenised-settlement machinery can be exercised first at product scale — asset-linked instruments such as vault-secured tokenised gold and sukuk-yield baskets for institutional liquidity management — before any monetary-scale deployment, so the architecture's invariants are battle-tested on hedging instruments long before they carry a money base.

### 6.5 Empirical illustration: interest-rate risk and the $\kappa$ alternative

The two natural experiments of the recent cycle — the 2020 pandemic and the 2022 rate shock — make the difference between an interest-anchored and a $\kappa$-anchored system directly visible on data (full detail and replication in the empirical companion, Ahmed & Bhuyan, 2026a). Three findings bear on the architecture of this paper.

*The primitive is a measurement, not a decision.* Over 2015–2026 the effective federal funds rate is held unchanged in 47% of months and then moved in discrete committee steps (from 0.08% in 2021 to 5.02% in 2023 *by decree*), while the measured $\kappa$ moves continuously (flat in only 4% of months). Their correlation is $-0.76$: the policy rate is the discretionary *response*, and $\kappa$ the contemporaneous *measurement*, of the same underlying risk. This is the empirical content of conducting policy by quantity against a measured backing rather than by a chosen rate.

*The counter-cyclical reflex is automatic, not discretionary.* In 2020 the interest system cut its policy rate from 1.58% (February) to 0.05% (April) — it *eased* as risk rose, a pro-cyclical injection of leverage into the crisis. Over the same window the measured $\kappa$ rose from 0.044 to 0.088, so the $\kappa$-priced base $M = \sum_i N_i e^{-\kappa_i(1-\delta)T_i}$ *contracts* ($-8.6\%$ for a representative five-year backing) exactly as risk spikes — the countercyclical issuance rule of §6 operating automatically, with no committee and no lag, on real data.

*The asset side carries no interest-rate duration.* Because a $\kappa$-priced claim at $\iota = 0$ carries no discount factor in $r$ (the Separation Theorem, Ahmed & Bhuyan, 2026b), its rate sensitivity $\partial\,\text{price}/\partial r$ is zero at every maturity. The 2022 shock makes the consequence vivid: repricing par bonds at the realised 2021-low-to-2022-high Treasury curve gives a steep duration gradient for conventional, interest-priced instruments — from $-4.5\%$ at one year to $-45\%$ at thirty — whereas the $\kappa$-priced equivalent has *zero* rate-driven loss at every tenor, retaining only a far shallower exposure (one to two orders of magnitude smaller) to the realised hazard itself. A reserve asset priced in $\kappa$ does not inherit the interest-rate risk that a single policy decision can impose on a bond-backed base; this is precisely the property a debt-free, equity-backed money requires of its backing.

*Scale of the removed charge.* Finally, the predetermined component this architecture removes is not small: at a $\sim$3.5% effective rate on a $\sim$\$315 trillion global debt stock, the interest system routes on the order of \$11 trillion a year — roughly a tenth of world output — as a charge for time owed regardless of outcome. At $\iota = 0$ that predetermined transfer is zero (the long–short funding flow nets to zero); what remains is only the contingent risk premium, borne where real risk is borne. (These are illustrative magnitudes from public aggregates; the structural point — a levy on the stock versus a contingent premium on borne risk — is exact.)

## 7 Price-Level Determinacy: A Fiscal Closure

The balance-sheet identity (4) ties base money to asset *values*; it does not, by itself, pin the general price level. This is not a peripheral caveat but the architecture's central theoretical question, and in its sharpest form it is a known trap. A system that issues money one-for-one against the market value of an asset book is, structurally, a *real-bills* regime, and real-bills regimes are the textbook example of price-level *indeterminacy*: if the issuer stands ready to monetise assets at their going price, both the nominal money stock and the price level can scale together with only their ratio determined (Sargent & Wallace, 1982). A monetary-economics referee will, correctly, ask why the $\kappa$-Standard escapes this. This section answers.

The escape has two ingredients, both already present in the design: the backing is *real* (sovereign equity, not nominal debt), and policy is a *quantity* operation with no fixed-price convertibility (Section 4). Together they place the system squarely in the fiscal theory of the price level (Leeper, 1991; Sims, 1994; Woodford, 2001; Cochrane, 2023), under which a determinate price level follows. That a determinate price level need not rest on an active interest-rate rule—the property an interest-free system must rely on—is precisely the lesson Cochrane (2018) draws from stable inflation at the zero bound, and the sense in which, as Sims (2013) puts it, fiscal backing rather than interest is what gives money its value. We make this precise.

### 7.1 The real backing and the valuation equation

Let $P_t > 0$ denote the general price level (money per unit of the consumption good). The pricing equations (1) and (2) evaluate each sukuk in *real* terms, because the underlying $X^{(i)}$ is a claim on real output (Definition 2.1); write the resulting real value of one unit of sukuk $i$ as $v_t^{(i)}$. Its nominal price is $P_t^{(i)} = P_t\, v_t^{(i)}$, and the identity (4) read in nominal terms becomes

$$M_t \;=\; P_t \sum_{i=1}^{n} N_i\, v_t^{(i)} \;=\; P_t\, \mathcal{V}_t, \qquad \mathcal{V}_t \;\equiv\; \sum_{i=1}^{n} N_i\, v_t^{(i)}, \tag{14}$$

where $\mathcal{V}_t$ is the *real backing*—the total real value of the ICB's book. Equation (14) is the $\kappa$-Standard's valuation equation: the real value of the money stock $M_t/P_t$ equals the real backing $\mathcal{V}_t$.

The backing has an explicit fiscal content. The sovereign sukuk are claims on the state's real productive assets, which throw off a stream of real primary surpluses $\{s_u\}_{u\geq t}$ (real resource rents and net fiscal receipts, in goods units). Pricing this stream at $\iota = 0$—so the *only* discounting is the convergence intensity $\kappa$, with no time-preference rate—gives

$$\mathcal{V}_t \;=\; \mathbb{E}_t^{\mathbb{Q}}\left[\int_t^{\infty} e^{-\kappa(u-t)}\, s_u\, du\right]. \tag{15}$$

**Lemma 7.1** (Finite, price-level-independent backing)**.** *If $\kappa > 0$ and $\mathbb{E}_t^{\mathbb{Q}} \int_t^{\infty} e^{-\kappa(u-t)} |s_u|\, du < \infty$, then $\mathcal{V}_t$ in (15) is finite, strictly positive whenever surpluses are positive on a set of positive measure, and is measurable with respect to real fundamentals alone—it does not depend on $P_t$.*

*Proof.* Finiteness is the stated integrability hypothesis, which $\kappa > 0$ secures whenever $\{s_u\}$ does not grow faster than $\kappa$ in $\mathbb{Q}$-mean; this is the monetary counterpart of the companion papers' observation that $\kappa > 0$ makes the convergence time $\tau < \infty$ $\mathbb{Q}$-a.s. and the valuation integral converge (Ahmed & Bhuyan, 2026a). Positivity is immediate. Price-level independence holds because $s_u$ (real surpluses) and $\kappa$ (a real intensity) are real objects, defined without reference to the numeraire. □ □

### 7.2 Determinacy

The remaining ingredient is that the nominal money stock is a *predetermined state*, not a free variable. Under debt-free seigniorage (Definition 3.1) and $\kappa$-OMO (Proposition 4.1), $M_t$ changes only through discrete quantity operations—issuance against newly monetised real projects, and open-market purchases or sales—each of which fixes a *nominal* increment at the date it is executed. The ICB does *not* offer to convert money into sukuk at a pegged nominal price; the price of the instrument, and hence $\kappa$, is market-determined (Corollary 4.2). We collect the conditions.

**(A1)** *Real equity backing.* Base money is a claim on real sovereign surpluses priced at $\iota = 0$, so the real backing $\mathcal{V}_t$ satisfies Lemma 7.1: finite, positive, and independent of $P_t$.

**(A2)** *Quantity regime, no fixed-price convertibility.* The *quantity instruments* are predetermined: holdings $N_i$ change only by discrete seigniorage and $\kappa$-OMO operations chosen by policy, and the ICB pegs no nominal price. The nominal base $M_t = \sum_i N_i P_t^{(i)}$ itself also moves continuously through the market revaluation of the existing book (Theorem 4.3); what (A2) rules out is any *policy* channel other than discrete quantity operations — in particular any standing offer to convert at a fixed price. The determinacy argument below requires only that the ICB sets quantities, not prices.

**(A3)** *No-bubble valuation.* $\kappa > 0$ and the integrability of Lemma 7.1 hold, ruling out a rational bubble in the real value of money.

**Theorem 7.2** (Price-level determinacy)**.** *Under* (A1)–(A3)*, the equilibrium price level is unique and strictly positive,*

$$P_t \;=\; \frac{M_t}{\mathcal{V}_t} \;>\; 0, \tag{16}$$

*and no self-fulfilling (sunspot) price path exists.*

*Proof.* By (A2), $M_t > 0$ is predetermined; by (A1) and Lemma 7.1, $\mathcal{V}_t > 0$ is finite and $P_t$-independent. The valuation equation (14) then has the unique positive solution (16). For dynamic uniqueness, suppose a candidate equilibrium posts a price $P_t' \neq P_t$ at date $t$ with $M_t$ predetermined. Equation (14) requires $\mathcal{V}_t' = M_t/P_t' \neq \mathcal{V}_t$. But $\mathcal{V}_t$ is pinned by real fundamentals—surpluses and $\kappa$—and is invariant to the price level by (A1); it cannot jump to accommodate $P_t'$. Hence $P_t'$ is not an equilibrium, and the transversality condition (A3) excludes explosive paths along which the real value of money diverges. The price level (16) is therefore locally unique. □ □

## 7.3 Why determinacy is earned, not assumed

Two remarks locate the result against the standard theory and show that each of its two ingredients is load-bearing.

**Remark 7.1** (The real-bills boundary)**.** Replace (A2) by fixed-price convertibility—let the ICB stand ready to exchange money for sukuk at a pegged nominal price. Then $M_t$ becomes endogenous, expanding elastically to meet demand at the peg, and $M_t$ and $P_t$ scale together: only the ratio $M_t/P_t = \mathcal{V}_t$ is determined, and the price level is indeterminate. This is exactly the real-bills indeterminacy of Sargent & Wallace (1982). Determinacy is thus a consequence of the quantity-operation design of Section 4—the ICB sets the quantity and lets the market set $\kappa$—and would be lost under a price peg. It is earned by the architecture, not assumed.

**Remark 7.2** (Equity backing is what makes the fiscal closure bite)**.** In the conventional fiscal theory the anchor is nominal government *debt*, whose real value $B_t/P_t$ falls with inflation; determinacy emerges as the fixed point of an implicit valuation equation. Here the anchor is a real *equity* claim whose real value $\mathcal{V}_t$ is price-level-independent (Lemma 7.1), so the valuation equation is solved *explicitly* for $P_t$ in (16) rather than implicitly. The $\kappa$-Standard's defining feature—base money is sovereign equity, not debt (Proposition 2.1)—is precisely what turns the fiscal valuation equation into a determinate price level.

There is a deeper structural point. The fiscal theory is usually *one* of two admissible regimes: Leeper (1991) shows the price level is determinate either under an active interest-rate rule with passive fiscal policy (the conventional monetarist/New-Keynesian case) or under passive money with active fiscal policy (the fiscal-theory case). An interest-free monetary system has *no interest-rate instrument*—there is no policy rate to make active. It is therefore confined, by construction, to the passive-money/active-fiscal regime. For the $\kappa$-Standard the fiscal theory is not an optional closure chosen among alternatives; it is the *only* determinacy theory available, and the architecture lands in exactly the regime where a determinate price level is fiscally pinned. Removing the interest rate does not leave determinacy unanswered—it selects which of Leeper's two answers applies.

### 7.4 Scope of the claim

Theorem 7.2 establishes price-level determinacy at the level the fiscal theory itself establishes it: a valuation equation that pins $P_t$ given a predetermined nominal stock, a real backing, and a no-bubble condition. Three extensions take this further, and each is developed in the companion general-equilibrium paper (Ahmed & Bhuyan, 2026e), which we summarise here. First, surpluses $\{s_u\}$ are exogenous in Theorem 7.2; the companion paper endogenises them with a fiscal reaction function and shows in closed form that the price level is determinate iff the fiscal response satisfies $\gamma_s < e^{\bar{\kappa}} - 1$—a riba-free analogue of Leeper's active-fiscal/passive-money threshold, with $\bar{\kappa}$ in the interest rate's place—of which Theorem 7.2 is the $\gamma_s = 0$ corner. Second, $\kappa$ is exogenous to $P_t$ here; the companion paper builds the full general equilibrium with a micro-founded interest-free money demand and an endogenous convergence intensity, and finds determinacy robust across a reduced-form credit feedback, a structural Bernanke–Gertler–Gilchrist micro-foundation, and a Tobin's-$Q$ revaluation channel. Third, beyond local determinacy it characterises the one regime in which the architecture can fail—a large credit shock against an exhausted Sovereign Stabilisation Fund—with an occasionally-binding model that produces fire-sale amplification and quantifies the backing buffer adequate to prevent it. What changes here relative to a bare accounting identity is already decisive: the price level is no longer free. Under an explicit and, for an interest-free system, *forced* fiscal closure, it is pinned by (16); the companion paper shows the pinning survives full general equilibrium.

## 8 Distributional Incidence: $\kappa$-Issuance versus Debt-Money

The architecture so far is distributional as much as monetary: it creates money debt-free (Section 3), assigns the seigniorage to the state rather than to private banks (Section 5), and ties issuance to real output by an identity (Proposition 3.1). This section makes that content explicit by asking the question the riba result does not answer: *who receives the gains from money creation, and from the productivity growth monetary policy accommodates?*

### 8.1 The Cantillon channel and its two ingredients

New money is never distributionally neutral, because it does not enter everywhere at once. Whoever receives it first transacts at pre-injection prices; by the time the injection has diffused and raised the price level, later recipients and holders of existing money have ceded purchasing power to the first recipient. This is the Cantillon effect (Cantillon, 1755). It has exactly two ingredients: a *sequence* (a first recipient) and a *slippage* (money growth in excess of real output, which raises the price level). The redistribution is their product—a first recipient with no slippage moves no purchasing power, because the new money is absorbed by new goods. We formalise this in the $\kappa$-Standard's own valuation equation (14), $P_t = M_t/\mathcal{V}_t$.

**Proposition 8.1** (Cantillon redistribution under the tether)**.** *Let new base money $\Delta M$ be issued to a first recipient against an increase $\Delta\mathcal{V}$ in the ICB's real book. Under the valuation equation (14), the real purchasing power transferred from holders of pre-existing money to the* *first recipient is, to first order in $\Delta M/M$,*

$$R \;=\; \mathcal{V}\Big(\frac{\Delta M}{M} - \frac{\Delta\mathcal{V}}{\mathcal{V}}\Big) \;=\; \mathcal{V}\,\hat{\pi}, \tag{17}$$

*the real money stock times the induced inflation rate $\hat{\pi} = \Delta P/P$. Under $\kappa$-monetisation (Definition 3.1, Proposition 3.1) issuance is matched to new real backing, $\Delta M^{\text{iss}} = \Delta\mathcal{V}$, so $\hat{\pi} = 0$ and $R = 0$: new money issued against new $\kappa$-priced real capacity transfers no purchasing power from existing holders. Any residual $R$ is proportional to the $\kappa$-mispricing $\Delta M - \Delta\mathcal{V}$.*

*Proof.* Before the injection the real value of the money stock is $M/P = \mathcal{V}$ by (14). After it the stock is $M + \Delta M$ with backing $\mathcal{V} + \Delta\mathcal{V}$, so $P' = (M + \Delta M)/(\mathcal{V} + \Delta\mathcal{V})$ and the pre-existing nominal stock $M$ has real value $M/P' = M(\mathcal{V} + \Delta\mathcal{V})/(M + \Delta M)$. The transfer is the loss to those holders,

$$R = \mathcal{V} - \frac{M(\mathcal{V} + \Delta\mathcal{V})}{M + \Delta M} = \frac{\mathcal{V}\,\Delta M - M\,\Delta\mathcal{V}}{M + \Delta M} \;\approx\; \mathcal{V}\big(\tfrac{\Delta M}{M} - \tfrac{\Delta\mathcal{V}}{\mathcal{V}}\big),$$

and $\Delta P/P = \Delta M/M - \Delta\mathcal{V}/\mathcal{V}$ follows by differentiating $\log P = \log M - \log\mathcal{V}$. Setting $\Delta M^{\text{iss}} = \Delta\mathcal{V}$ from (5) gives $R = 0$. □ □

Proposition 8.1 is the distributional reading of the real-output tether. The tether is usually stated as a quantity discipline (money grows with output); it is equally the condition that drives the Cantillon redistribution to zero. The new money has a first recipient—the project whose capacity is monetised—but because the injection is exactly absorbed by the new backing, the price level is unchanged and no existing holder is diluted. Redistribution returns only to the extent that $\kappa$ misprices the project ($\Delta M \neq \Delta\mathcal{V}$), and because $\kappa$ is read from markets rather than administered (Section 4), that slippage is bounded by measurement error, not by discretionary issuance.

The accounting result of Proposition 8.1 is promoted to a general-equilibrium theorem in the companion paper (Ahmed & Bhuyan, 2026e): in the full DSGE the same equity-backing identity $M/P = \mathcal{V}$ that forces the fiscal closure (and hence price-level determinacy) also drives the steady-state Cantillon transfer to zero, so distributional neutrality is there a *corollary of determinacy* rather than a separate assumption—the equation that pins the price level is the equation that zeroes the redistribution. The remainder of this section reads the same content against the incumbent debt-money system, where the corresponding transfer is positive by construction.

## 8.2 The debt-money benchmark

The incumbent system distributes the same flows through three channels that are regressive by construction.

1. **Interest.** Debt-money requires interest service—a transfer from net debtors, disproportionately median households, to net creditors. The $\kappa$-Standard removes this at the root: the base earns and pays no interest ($\iota = 0$).
2. **Private seigniorage.** Commercial banks create most broad money by lending and capture the creation rent as franchise value. Under full reserves (Section 5) the seigniorage is socialised; the $\Delta M = P^{(*)}$ of Definition 3.1 accrues to the Treasury, not to bank equity.
3. **Asset Cantillon with unbounded slippage.** New money enters through credit and asset purchases and lands on *existing* assets—housing, secondary-market equities—not new output. In the notation of (17), $\Delta M$ is untethered to $\Delta\mathcal{V}$: money growth is set by credit demand and by an explicit positive-inflation mandate, so $\hat{\pi} > 0$ systematically and $R$ accrues to asset-holders. This is empirically documented rather than hypothetical: the Bank of England's

own analysis finds that the asset-price gains from post-2008 quantitative easing accrued disproportionately to the wealthiest households (Bell et al., 2012); the BIS attributes the post-crisis rise in wealth inequality chiefly to QE-driven equity-price appreciation (Domanski et al., 2016); the pattern recurs in Japanese unconventional policy through the portfolio channel (Saiki & Frost, 2014); and the survey evidence concurs that unconventional easing tends to widen wealth inequality through asset prices (Colciago et al., 2019). The $\kappa$-Standard replaces this with the tethered issuance of Proposition 8.1.

| Channel | Debt-money (incumbent) | $\kappa$-Standard |
|---|---|---|
| Interest service | debtors $\to$ creditors | none ($\iota = 0$) |
| Seigniorage | private bank franchise | public (Treasury) |
| New money lands on | existing assets | new $\kappa$-priced output |
| Aggregate transfer $R$ | $\mathcal{V}\hat{\pi}$, $\hat{\pi} > 0$ by mandate | 0 up to $\kappa$-mispricing |
| First recipient | borrowers, dealers | monetised-project owners |
| Tech/efficiency dividend | suppressed $\to$ asset inflation | $\hat{\pi} < 0$ to all holders$^\dagger$ |

$^\dagger$ only if the standard forgoes a positive-inflation target; see below.

### 8.3 The two levers the architecture does not settle

Proposition 8.1 should not be over-read. The tether sets the *aggregate* redistribution to zero, but it does not abolish the Cantillon sequence: the issuance rate $\varphi_t = \mathbb{E}_t[\,\mathrm{d}M_t^{\mathrm{iss}}]/\,\mathrm{d}t$ remains a spigot, and the monetised project is still the first recipient. Two questions the architecture enables but does not answer decide whether the realised system is fairer.

*First, the inflation objective.* The most regressive feature of the incumbent regime is not interest but the positive-inflation mandate, which suppresses the deflation that technology and efficiency would otherwise produce and routes the accommodating money into assets (Domanski et al., 2016). The $\kappa$-Standard targets a quantity—the tether and the $\kappa$-OMO of Section 4—rather than a price index. If it forgoes an inflation target, productivity growth ($\hat{g}_{\mathcal{V}} > \hat{g}_M$) appears as $\hat{\pi} < 0$ in (17): falling prices, hence $R < 0$, a real gain distributed to *every* holder of money rather than to owners of appreciating assets. This is the single largest distributional difference available—larger than the removal of interest—and we flag it as a design commitment the standard should make explicit rather than leave implicit in the quantity rule. To gauge the order of magnitude: an advanced economy running a 2% inflation target against a 1–1.5% trend productivity growth forgoes roughly 3–3.5 percentage points per year of money-base purchasing power—a flow the incumbent regime routes into asset prices (and, by the evidence above, disproportionately to the top wealth decile) but that a price-stable $\kappa$-quantity rule would instead distribute uniformly to every money holder. Compounded over a decade this dwarfs the one-off elimination of the interest wedge; the deflation dividend, not the removal of riba, is where the bulk of the distributional gain lies.

*Second, the governance of monetisation.* With the aggregate transfer tethered to zero, the residual question is *who may be a monetisation counterpart*: whose projects the ICB monetises, and on what terms. If access is broad and rule-based—any productive project priced at a transparent, market-read $\kappa$—the channel is far more democratic than discretionary credit and asset purchases. If monetisation is captured by politically connected developers—the classic failure mode of state-directed credit—the Cantillon sequence delivers its first-recipient advantage to a connected few, and the system can be as regressive as the one it replaces, with state capture substituted for financial capture. The market-observability of $\kappa$ is the structural safeguard: fixing the monetisation *price* outside policy discretion removes the lever through which such capture usually operates, but it does not by itself constrain project *selection*.

**Scope.** The $\kappa$-Standard removes the *mathematical necessity* of the three regressive channels of debt-money: it eliminates interest, socialises seigniorage, and tethers issuance so that the aggregate Cantillon redistribution is zero up to $\kappa$-mispricing. It does not, by construction alone, guarantee a fair *realised* distribution—that turns on the inflation objective and the governance of monetisation, both political choices. "Interest-free" is thus necessary but not sufficient for "equitable"; the contribution here is to locate the remaining distributional content precisely—in the objective for $\hat{\pi}$ and the selection rule for $\varphi_t$—rather than in the pricing of money, which the riba result settles.

## 9 Limitations and Honest Boundaries

The $\kappa$-Standard is a monetary architecture, and like the Chicago Plan it is a design rather than an estimated model. We state its boundaries plainly; each is load-bearing for the credibility of the proposal.

**It does not fix the price level.** Proposition 2.1 guarantees that base money is backed one-to-one by the present value of real assets. It does *not* guarantee a constant price level. The backing is only as good as the $\kappa$-prices themselves: estimation error in $\kappa$, model error in the discount function $D$, and real shocks to the asset values $X^{(i)}$ all move $M_t$ and hence the price level. Moreover, as Goodhart (1998) stresses, the acceptance and value of money depend on state (fiscal/tax) power, not on asset backing alone. The correct claim is narrow: the $\kappa$-Standard eliminates *debt-financed* and *unbacked* money creation and ties the base to real-asset value—not that it abolishes inflation.

**Determinacy holds under a fiscal closure, and survives general equilibrium.** The balance-sheet identity $M_t = \sum_i N_i P_t^{(i)}$ is nominal and, taken alone, pins only asset *values*, not the price level—and in its sharpest form it risks the real-bills indeterminacy of Sargent & Wallace (1982). Section 7 closes this: because the backing is real sovereign equity and policy is a quantity operation with no fixed-price convertibility, the fiscal valuation equation (16) delivers a unique, strictly positive price level (Theorem 7.2) — and, an interest-free system having no interest instrument to make active, this fiscal regime is its natural determinacy closure (Section 7). Theorem 7.2 takes surpluses and $\kappa$ as exogenous; the companion general-equilibrium paper (Ahmed & Bhuyan, 2026e) endogenises both and shows determinacy survives. The determinacy claim is therefore established in partial equilibrium here and in full general equilibrium in the companion paper: the price level is no longer free.

**$\kappa$-OMO requires credit-bearing assets.**

**Remark 9.1.** The transmission of Proposition 4.1 relies on $\partial P/\partial\kappa < 0$, which holds only for credit-bearing sukuk. For a pure at-par perpetual ($\delta \to 1$), $P = X$ independently of $\kappa$, so open-market purchases move the price but not the implied intensity, and $\kappa$-OMO has no traction. The central bank's policy portfolio must therefore consist of credit-spread-bearing sovereign sukuk, not riba-free at-par claims.

**The automatic contraction is procyclical, and only boundedly correctable.** Corollary 4.4 shows the base contracts when $\bar{\kappa}$ widens, a procyclical response of exactly the kind Borio (2014) identifies as the core hazard of asset-linked monetary aggregates. Section 6 addresses it with a countercyclical issuance rule (Proposition 6.1) that neutralises the revaluation channel and holds the base on a target growth path—but only within the backing constraint (13). The correction is therefore *bounded*: in a stress severe enough to exhaust real-capacity issuance and the Sovereign Stabilisation Fund, the contraction reasserts. We regard this boundedness as a deliberate feature (Section 6), not a defect, but it is a genuine limit relative to unbounded fiat stabilisation, and quantifying the SSF buffer adequate for a target distribution of $\bar{\kappa}$ shocks is the principal empirical extension this paper opens.

**State seigniorage is assumed, not proven optimal.** We follow Al-Jarhi and the Chicago Plan in vesting money creation in the state. Selgin & White (1994) argue competitive private money provision can be stable and disciplined; we do not refute them. The $\kappa$-Standard is compatible with a single sovereign issuer or with competing issuers each running the same $\kappa$-pricing; choosing between them is a separate question.

**Riba is resolved; possession is not.** As throughout the programme, the $\kappa$ construction resolves *riba* mathematically but leaves *qabd* (constructive possession) of the underlying real assets as contract-level work for a Shariah board, inherited unchanged from the companion papers.

**The anchor is a priced ($Q$-measure) intensity, and its premium cannot be mutualised away.** The empirical companion (Ahmed & Bhuyan, 2026a) separates the measured $\kappa$ into a realised hazard $\kappa^P$ and a priced $\kappa^Q$, the wedge between them being a risk premium. Two features of this architecture pin the monetary anchor to the priced side. First, $\kappa$-OMO has traction only on credit-spread-bearing assets (Remark 9.1), and a market-read spread is a $\kappa^Q$ object. Second, the market-observability of $\kappa$ is exactly the safeguard against monetisation capture identified in the distributional analysis above — fixing the monetisation price outside policy discretion means *reading* it from the market, i.e. at $\kappa^Q$. The base is therefore anchored to a premium-bearing intensity, and the residual it carries once $\iota = 0$ is precisely "the contingent risk premium, borne where real risk is borne" (§6.5). This is where the monetary layer parts company with the takaful and cooperative-guarantee instruments of the companion papers. There the wedge $\kappa^Q - \kappa^P$ can be priced out: a mutual pool charges the realised $\kappa^P$ and returns any premium to members as surplus, which collapses those cases onto settled actuarial ground. A monetary base cannot mutualise its own unit of account; reading $\kappa^Q$ from the market is a feature here (it is the anti-capture safeguard), not a defect, but it leaves the base carrying a market risk premium and therefore on the contested jurisprudential frontier the companion reduction identifies, not on the settled ground of takaful. Whether a fully contingent, predetermined-charge-free premium of that kind is permissible in the unit of account is the one open question this architecture inherits and does not itself settle.

## 10 Conclusion

Islamic monetary theory and the Western full-reserve tradition spent the better part of a century converging, independently, on a single conclusion: money should be created debt-free by the state and separated from interest-bearing credit. Both were stopped at the same point—the absence of a riba-free price at which the assets backing the money base could clear. This paper supplies that price. By elevating the convergence intensity $\kappa$ from a pricing primitive to a monetary base, the $\kappa$-Standard makes money the present value of sovereign equity (Proposition 2.1), ties its growth to real output (Proposition 3.1), conducts policy through quantity while the market sets the price of capital (Corollary 4.2), and removes the demand-deposit run (Proposition 5.1). Its money base obeys a clean law of motion (Theorem 4.3) with a built-in contraction under credit-deterioration shocks (Corollary 4.4) that a countercyclical issuance rule neutralises within an explicit backing constraint (Section 6). Because the backing is real equity and policy is a quantity operation, the base escapes real-bills indeterminacy and pins a unique price level under the fiscal theory of the price level—the natural determinacy closure for a system with no interest-rate instrument (Theorem 7.2).

We have been deliberate about what the architecture does not do: its price-level determinacy is established here under a fiscal closure with exogenous surpluses, with the general-equilibrium version—endogenous fiscal feedback and an endogenous convergence intensity—developed in the companion paper (Ahmed & Bhuyan, 2026e), which finds it survives; its stabilisation is bounded (it trades unbounded-but-unbacked fiat intervention for bounded-but-backed monetisation); and it is a design whose pricing primitive's empirical reality rests on the authors' companion papers rather than on new or independently replicated evidence here. What it offers is a candidate way to close a long-standing gap. The companion papers argue that interest is a removable parameter and that $\kappa$ prices the instruments of an Islamic financial system on real data; this paper proposes that the same $\kappa$ can serve as the clearing object for the monetary system above them, and the companion general-equilibrium paper shows the proposal survives a fully micro-founded model. The same $\kappa$ thus supplies the riba-free market-clearing price that the Islamic and Chicago-Plan full-reserve programmes both required and neither had.

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