



ECONOMIC MODELING ADDENDUM

# ECONOMIC MODELING ADDENDUM —

· Track T1 — / BoringVault RWA vault

PROJECT



TRACK

T1

DATE

14 April 2026

TYPE

Structural modeling

SCOPE

Full-tier (in scope)

CLASSIFICATION

PUBLIC SAMPLE

**Disclaimer.** This economic addendum is structural mechanism modeling, not a forecast, a solvency certificate, or formal verification. Models are parameterized on the configured/observed parameters and sweep unobservable off-chain inputs across ranges to mark the safe region; no probabilities of real-world events (defaults, runs, price moves) are asserted. It is a companion to the security review and penetration-test reports for the same track and is in scope for the Full tier. Not investment, legal, or financial advice. ■■■ may publish or share this report in full, unmodified form, including this disclaimer.

## 00 MASTER VARIABLES

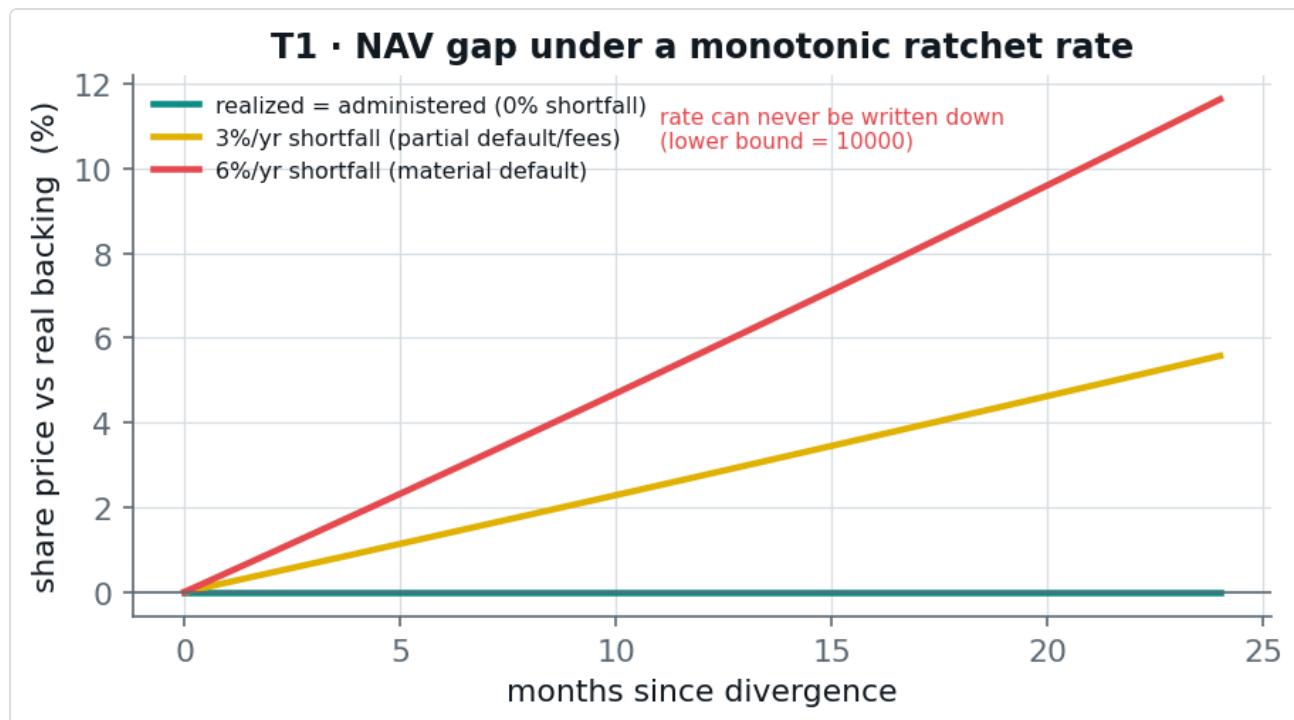
Two numbers govern solvency and are neither on-chain-enforced nor disclosed; every model below is a function of them.

**R / realized-yield shortfall (s).** The share price grows deterministically at the administered lending rate R (up to maxLendingRate 50%), while real backing grows at the realized loan yield. The gap is driven by  $s = R - \text{realized}$ . Because the exchange-rate lower bound is 10000, R can **never be written down** — the gap is one-directional.

**Liquid buffer ratio  $r = L / V$ .** Backing is lent out to borrowers, so only the liquid buffer L in the vault services redemptions, against share liabilities  $V = \text{totalSupply} \cdot R$ . r is the fraction of liabilities redeemable at par before the vault runs dry.

## NAV GAP UNDER A MONOTONIC RATCHET RATE

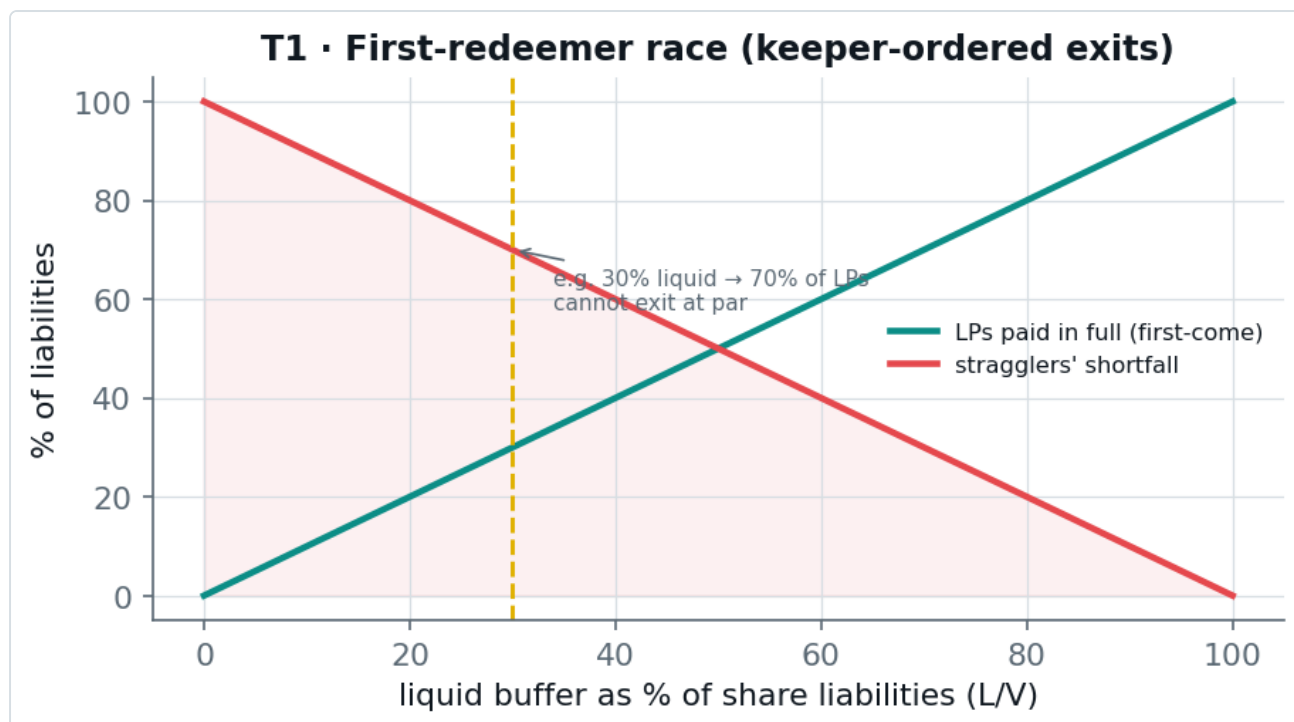
With R fixed at 12% and realized yield falling short by 0/3/6% per year, the share price diverges from real backing and cannot be corrected down. At a 6% shortfall the gap exceeds ~12% within two years — value that early redeemers extract in full and late redeemers lose.



Share price vs real backing over time, by realized-yield shortfall

## FIRST-REDEEMER RACE (KEEPER-ORDERED EXITS)

Once backing is lent out, only the liquid buffer services exits, and the keeper chooses ordering. If the buffer is 30% of liabilities, 70% of LPs cannot exit at par — and on the ████████ vault the party holding the strategist/rate-bot/pauser key also calls the solver, so it can self-preference.



Fraction of LPs paid in full vs liquid buffer ratio

## CROSS-CHAIN RATE DIVERGENCE (STRUCTURAL)

Each chain runs an independent Accountant with its own `exchangeRate` and `lendingRate`, yet shares bridge 1:1 and are valued at the destination's local rate. Any persistent skew between two chains' rates opens a bridge-and-redeem arbitrage: mint where the rate is low, bridge, redeem where it is high. The defence is operational — a keeper cadence that keeps per-chain rates synced — not a code invariant; the skew tolerance should be modeled against the actual update cadence per chain.

## 02 SURFACE RANKING

S = existential (solvency) · A = severe · B = bounded. Vectors are coupled and multiplicative; the hub is the administered ratchet rate.

| VECTOR                                  | WHY                                                                                                                                                                            |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>S</b> NAV-gap / first-redeemer drain | Ratchet rate decoupled from lent-out backing + keeper-ordered exits + no write-down ⇒ insolvency losses are socialized to stragglers and can be self-preferenced (hub vector). |
| <b>A</b> Redemption liveness            | No permissionless emergency exit — a down/censoring keeper freezes funds; pausing does not stop the liability accruing.                                                        |
| <b>B</b> Cross-chain rate arbitrage     | Independent per-chain accountants + 1:1 bridged shares ⇒ skew arbitrage, bounded by keeper sync cadence.                                                                       |

## 03 STANDOUT ACTION

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**Highest-leverage change:** break the ratchet. Introduce a permissioned rate-*down* path (or a NAV-linked accountant that marks the share price to realized backing) **and** a permissionless, time-delayed emergency redeem at the last-checkpointed rate. Together these defuse the S-vector (losses can be recognized instead of raced for) and the A-vector (funds can always exit), and shrink the value of the cross-chain skew. Pair with splitting the strategist / rate-bot / pauser / solver keys onto separate multisigs so no single key can inflate-and-self-solve.

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