Revnet Parameters Analysis

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Abstract

Contents

Executive Summary

This report validates three Revnet mechanism designs through computational experiments and provides quantitative guidance for parameter selection.

Key Findings:

1. Token-Launchpad achieves 1,820% treasury growth but requires $r_k \geq 20\%$ for optimal capital preservation
2. Stable-Commerce maintains 0.02% volatility but needs 2.75%/quarter growth to sustain loan viability
3. Periodic Fundraising balances growth (+371%) and stability (0.11% volatility) but should increase σ from 20% to 40-50%

1 Introduction

This document builds on the technical framework established in the Revnet whitepapers to map parameter choices to system behaviors and trade-offs. Our objective is to define *recommended configurations and guardrails* for founders, analyzing how each archetype behaves under specific issuance, tax, and loan settings.

2 Archetypes

We focus on three archetypes:

1. **Token Launchpad:** *designed for narrative-driven, speculative communities where issuance occurs over a short period before transitioning into open-market trading. It suits high-momentum launches such as cultural tokens or early-stage projects where rapid treasury growth and liquidity bootstrapping are prioritized over long-term stability.*
2. **Stable-Commerce:** *tailored for businesses seeking predictable, loyalty-driven economics rather than speculative trading dynamics, creating a stable, revenue-backed currency.*
3. **Periodic Fundraising:** *built around periodic issuance cycles (e.g., 30–90 days) that create natural marketing and storytelling moments. Used for projects with periodic issuance increases, acting as timed fundraising rounds.*

Each archetype illustrates a distinct parameter regime within the Revnet design space, showing how simple deterministic rules lead to predictable user incentives and stable treasury dynamics.

Parameter	Archetype 1 – Token Launchpad	Archetype 2 – Stable Commerce	Archetype 3 – Periodic Fundraising
σ	It should be small to allow broad access to the token supply during the first stage and encourage trading without excessive taxation.	Should be high ($\sim 98\%$) so that commerce owners have access to most of the capital. This also makes it difficult for other actors to open an AMM.	A moderate split ($\sim 40-50\%$) ensures that each purchase returns part of the issuance as alignment and part to the split receiver, creating incentive symmetry.
r_k	It should be high ($\geq 20\%$), discouraging cash-outs and ensuring that exits lift the price floor sharply. Participants are incentivized to trade rather than redeem.	Should be small (e.g. $\leq\sim 8\%$ but non-zero) to let users and merchants access capital efficiently while still discouraging excessive short-term withdrawals.	Should be sufficiently high to make exits accretive to the floor, yet low enough to keep borrowing viable. This keeps token holders engaged (e.g. between $8-20\%$).
P^{ceil}	Should increase slowly in the first phase, then accelerate faster than expected AMM-driven price growth, effectively removing upper bounds to the price.	If constant, agents are better off redeeming. An increase of at least $+2.75\%$ per quarter is sufficient to make borrowing attractive.	Should increase with periodic steps (e.g., $+50\%$ per month), generating anticipation and momentum before each new issuance round, lifting the floor and strengthening ecosystem engagement.

Table 1: Parameter tendencies across archetypes.

Archetype 1 – Token Launchpad

A Token Launchpad Revnet is designed for narrative-driven, speculative communities where issuance occurs over a short period before transitioning into open-market trading. It suits high-momentum launches such as cultural tokens or early-stage projects where rapid treasury growth and liquidity bootstrapping are prioritized over long-term stability.

Analysis

The system unfolds in two main phases.

Phase I – Issuance Stage. Tokens are issued at a predetermined price $P_{\text{issue}}(t)$, and all proceeds accumulate in the treasury $B(t)$. Since the goal is to build a deep liquidity pool at launch, cash-outs should be discouraged through a high redemption tax r_k (e.g., $r_k \geq 20\%$). A higher r_k serves two purposes: it amplifies each floor-price increase per redemption and preserves most of the raised capital within the system. Although a high tax raises the cost of repaying loans, it also speeds up floor growth, which offsets this effect and maintains loans viable. Strong participation (large inflows and few redemptions) maximizes the treasury-to-supply ratio B/S, setting the conditions for a well-backed AMM pool at launch. The split parameter σ should remain relatively small, ensuring broad access to the token supply during the issuance phase.

Phase II – Market Stage. At a predefined time, the revnet transitions to an AMM-based regime similar to a Token Generation Event (TGE). The issuance price $P^{\text{ceil}} \to \infty$ quickly escapes being effectively no longer active, and price discovery depends on market demand. The AMM price fluctuates uncapped over the price floor:

$$P^{\text{floor}}(t) \leq P^{\text{AMM}}(t) \tag{1}$$

If the liquidity pool (LP) is deep enough, P^{AMM} remains above the floor and trading dominates system activity. Trading on the AMM, however, no longer affects the price floor directly. As a result, once the system enters this phase, the deterministic relationship between user activity and floor growth weakens. To restore a degree of positive feedback, part of the AMM's trading fees or LP yield can be routed back for periodic *buybacks and burns*. This mechanism increases the backing ratio B/S, thereby reinforcing $P^{\text{floor}}(t)$ and extending value accrual dynamics beyond the issuance phase.

Token Launchpad revnets are inherently high-volatility systems where early participants fund the treasury in expectation of later price appreciation. Their behavior during and after issuance is shaped by the following mechanisms:

- **Liquidity Preservation:** High r_k should discourage early redemptions and secure capital for post-launch liquidity.
- **Liquidity Sufficiency:** If liquidity is inadequate and P^{ceil} escapes rapidly, supply becomes fixed while trading continues. The resulting shallow LP leads to high price volatility, which can undermine confidence and incentivize participants to cash out rather than sustain token trading.
- **Floor Dynamics:** Once the AMM phase begins, floor growth decelerates as buy/sell activity shifts to the AMM, reducing the deterministic link between user inflows and $P^{\text{floor}}(t)$.
- **Buyback Tuning:** Redirecting AMM fees or yield toward buybacks can reinforce the floor, but excessive burns without sufficient LP depth may drain liquidity and amplify volatility.
- **Exit Sequencing:** As speculative activity cools, rational holders exit once AMM returns decline. Late redeemers capture the highest value as redemptions lift the floor.

When properly tuned, Launchpad revnets can self-propagate through speculative cycles while preserving enough backing to sustain post-hype liquidity. If issuance exceeds demand or buybacks drain LP reserves too quickly, liquidity deteriorates and exits might dominate the system.

Archetype 2 – Stable-Commerce Revnet

A Stable-Commerce Revnet functions as a stablecoin-like issuance system tailored for businesses seeking predictable, loyalty-driven economics rather than speculative trading dynamics.

A business (for example, a coffee shop) can issue one token per USDC received, effectively creating a stable, revenue-backed currency. Most of each payment's value remains with the business, while a small portion is distributed to the customer as cashback (i.e. issuance split $\sigma_k \sim 0.98$). Small, periodic increases in issuance price can reward early customers without introducing volatility. This model emphasizes stability and loyalty, not speculation or AMM trading.

Analysis

Let the issuance price define the upper bound of the corridor:

$$P^{\text{ceil}} = P(t) = P_{\text{issue}}(t) \tag{2}$$

$P(t) = \overline{P}$ is constant between two issuance cut events. If the time window between two such events is sufficiently large, the floor will converge to an equilibrium value:

$$P^{\text{floor}}_{\text{eq}} \approx 0.95 \cdot \overline{P} \tag{3}$$

The speed with which the price floor will converge to this value will depend on the rate of issuance activity, on its size, and the current ceiling price (the higher, the faster). Moreover, the higher the cash-out tax, the faster the price floor will grow per redemption, converging faster to that value. Under these conditions, there can be two different options:

1. $P_{\text{issue}}(t)$ remains constant forever;
2. $P_{\text{issue}}(t)$ slightly increases at specific times (e.g. every quarter);

Case 1 – Constant issuance price: Let us now assume that $P_{\text{issue}}(t)$ remains constant forever. Under these conditions, once the floor price had converged to the equilibrium value, i.e. $95\% \cdot P_{\text{issue}}$, then the price floor halts its growth. At this point, there is no incentive for a rational actor to hold the \$TOK Revnet token, since price appreciation has halted. At this point, all token holders exit their positions, cashing out.

Case 2 – Increasing issuance price: Let us now assume that $P_{\text{issue}}(t)$ slightly increases at specific times (e.g. every quarter). Under these conditions, then P^{floor} follows $P_{\text{issue}}(t)$ proportionally, preserving a predictable appreciation path.
Such a price floor increase can sustain borrowing over cashing out. Indeed, for a loan to be more attractive than redemptions (cash-outs), the token's resale price must appreciate beyond the discounted floor value:

$$\Delta P^{\text{sell}} > (1 - a) \cdot P^{\text{floor}}(t_0, q) \tag{4}$$

where a is the loan-tax parameter.
If we assume that there is no AMM:

$$P^{\text{sell}}(t) = P^{\text{floor}}(t) \approx 0.95 P_{\text{issue}}(t) \tag{5}$$

Thus, the growth condition simplifies to:

$$\frac{P_{\text{issue}}(t_1)}{P_{\text{issue}}(t_0)} > 2 - a \tag{6}$$

This means that the expected growth of the issuance price of the network needed to sustain borrowing activity rather than redemption is dependent on the loan prepaid window:

6-month prepaid window $\Rightarrow$	$a = 0.941 \Rightarrow$	Price growth factor 5.9%
10-year loan window $\Rightarrow$	$a = 0.632 \Rightarrow$	Price growth factor 36.8%

If this inequality is not satisfied, participants prefer exiting rather than taking loans.
These conditions imply that if a business increases the issuance price of:

$$+2.95\% \text{ per quarter } (\approx 5.9\% \text{ every six months})$$

This ensures that:

- The floor price P^{floor} follows accordingly, with speed that will depend on the amount of issuance and cash-out activity. This means that the higher the rate of selling and the larger the sales, the faster the floor converges to the equilibrium value.
- Loans remain more profitable than cash-outs, thereby preserving liquidity throughout the loan cycle.

If an AMM is added, its market price would remain within a narrow corridor:

$$P^{\text{floor}} \leq P^{\text{AMM}} \leq 0.95 \times P^{\text{ceil}} \tag{7}$$

However, if buying activity is preserved, then this acts as an upward pressure on the AMM price. This, can potentially make $P^{\text{AMM}} \to P^{\text{ceil}}$ converge to the issuance price (price ceiling).

The Stable-Commerce Revnet behaves as a revenue-pegged stablecoin with built-in loyalty incentives. It transforms recurring payments into a self-stabilizing currency whose value is maintained through activity rather than speculation. Periodic, controlled issuance adjustments sustain floor growth, aligning the system toward predictable stability and durable liquidity.

Archetype 3 – Periodic Fundraising

A revnet built around periodic issuance cycles (e.g., 30–90 days) that create natural marketing and storytelling moments.
Sits between the speculative and stable forms. Used for projects with periodic issuance increases ("30 to 50%") acting as timed fundraising rounds. Each period ends with a short promotional window before the next price increase, allowing teams to share progress and invite new participants. This design emphasizes cadence and communication over constant market watching.

Analysis

Periodic Fundraising revnets operate through discrete issuance cycles that couple economic incentives with narrative and marketing cadence. Each cycle functions as a timed fundraising round where issuance parameters reset, creating predictable phases of growth, engagement, and consolidation.

Issuance Phase. During each cycle, tokens are issued at a defined ceiling price $P^{\text{ceil}}(t)$, which typically increases stepwise between rounds (e.g., +50% monthly). This design creates anticipation for future rounds: participants who join earlier benefit from a lower entry price and contribute to raising the floor $P^{\text{floor}}(t)$ for subsequent issuances. A moderate split ($\sigma \approx 50\%$) ensures that every purchase both funds the treasury and returns a portion as alignment rewards, reinforcing cooperative behavior between new entrants and existing holders.

Retention and Exit Dynamics. The redemption tax r_k should be high enough that exits remain accretive to the floor but small enough to keep borrowing attractive between rounds. This discourages premature redemptions while maintaining liquidity in the system. Due to the periodic hype-cycles determined by the stepwise increase of the issuance price, buying activity keeps either expanding the treasury (without AMM) or raises the sell price (with AMM). Thus, the system can sustain continuous floor appreciation, making long-term participation rational.

Market Behavior. Unlike Launchpad revnets, which quickly transition into open trading, or Stable-Commerce systems, which aim for equilibrium, Periodic Fundraising revnets rely on recurring issuance events as moments of coordinated activity. The cyclic increase of P^{ceil} drives renewed attention and speculative demand, while controlled taxation and moderate splitting maintain internal capital recycling. This rhythm transforms the network into a repeatable fundraising engine, where each issuance strengthens both the treasury and the narrative continuity of the ecosystem.

3 Tax Regime Considerations

The cash-out tax parameter r_k creates a threshold at approximately 39.16% with strategic implications for liquidity access.

Below 39.16%**:** Direct redemption provides superior immediate liquidity compared to loans for all position sizes (Section 5.1). Myopic investors seeking immediate capital will always prefer cash-out over borrowing.

Above 39.16%**:** Large holders can access more immediate liquidity through loans than through direct cash-out. This creates a potential strategic default pathway where investors take maximum loans and default rather than repay, effectively using the loan mechanism as a superior exit route. Section 4.3 proves such defaults do not threaten solvency (the treasury retains borrowed funds while collateral remains burned), and this strategy becomes less viable as outstanding loans accumulate.

Stabilization mechanism: Regardless of tax level, every redemption unconditionally increases the price floor since $C_{\text{tot}}(q)/q < B/S$ (Section 3.2). During uncertainty, exiting investors subsidize remaining holders through the cash-out tax. Higher taxes amplify this stabilization but also increase growth requirements for loan profitability.

4 Computational Experiments and Numerical Validation

To validate theoretical predictions and explore regime boundaries beyond analytical tractability, we developed a continuous-time simulation framework implementing the rate-based ODE system described in the companion technical paper. The simulator discretizes the dynamics using adaptive Runge-Kutta integration (RK45) with dense output, maintaining numerical accuracy below 0.01% relative error when compared to closed-form solutions over constant-rate intervals.

4.1 Methodology

4.1.1 Simulation Framework

The computational environment tracks the state vector $(B(t), S(t))$ evolving under the governing equations:

$$\dot{S}(t) = \frac{r_{\text{in}}(t)}{P_{\text{issue}}(t)} - r_{\text{out}}(t), \tag{8}$$

$$\dot{B}(t) = r_{\text{in}}(t) - (1 - r_k)\frac{B(t)}{S(t)}\, r_{\text{out}}(t), \tag{9}$$

where $r_{\text{in}}(t)$ and $r_{\text{out}}(t)$ represent expected aggregate cash-in and redemption rates respectively, measured in base units per time and tokens per time. The framework handles multi-stage configurations with discontinuous price steps at stage boundaries through right-continuous issuance price functions $P_{\text{issue},k}(t) = P_{\text{issue},k,0}\gamma_k^{\lfloor (t-t_k)/\Delta t_k \rfloor}$, auto-issuance events as Dirac impulses causing instantaneous supply jumps while preserving treasury continuity, and continuous floor tracking via $P^{\text{floor}}(t) = (1 - \phi_{\text{tot}})(1 - r_k)B(t)/S(t)$ with validation against analytical steady states.

4.1.2 Numerical Accuracy Verification

Before conducting archetype experiments, we validated the solver against analytical benchmarks. For constant rates $r_{\text{in}}, r_{\text{out}}$ over a fixed issuance price $\bar{P}$, the closed-form solutions from equations (15)–(17) provide ground truth. Testing across the parameter space $r_k \in [0, 0.4]$ with balanced flows ($r_{\text{in}}/\bar{P} = r_{\text{out}}$) over $t \in [0, 200]$ yielded maximum relative errors in $S(t)$ and $B(t)$ below 0.0001%, with steady-state convergence to $P_*^{\text{floor}} = 0.95\bar{P}$ achieved within 10^{-4} tolerance. This precision validates both the integrator implementation and the discretization scheme.

4.2 Archetype Simulations

We instantiated the three archetypes described in Section 2 using parameter configurations aligned with Table 1, then subjected each to representative activity patterns capturing their intended use cases.

4.2.1 Experiment 1: Token Launchpad Revnet

The Launchpad archetype operates in two distinct phases. Phase I (Issuance) spans $t \in [0, 90]$ days with initial issuance price $P_{\text{issue},0} = \$0.10$ escalating via $\gamma_{\text{cut}} = 0.20$ (implying $\gamma = 1.25$, a +25% weekly increase) every $\Delta t = 7$ days, combined with $r_k = 0.05$ and $\sigma = 0.15$. Phase II (AMM) extends from $t \in [90, 180]$ days, where P_{issue} jumps to \$10.00 to effectively close minting while maintaining the same r_k and σ. We model decreasing enthusiasm during issuance as $r_{\text{in}}(t) = 500e^{-t/30} + 50$ for $t < 90$ days, dropping to minimal post-TGE activity of $r_{\text{in}}(t) = 5$ thereafter.

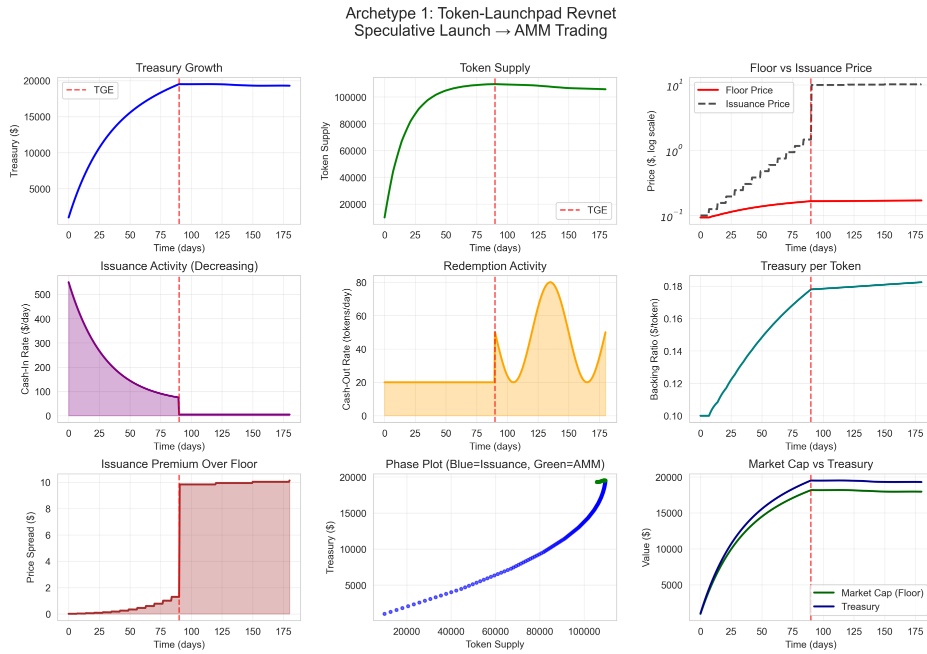

Figure 1: Simulation results for the Token Launchpad archetype. Phase I exhibits exponential treasury growth driven by declining issuance rates against aggressive weekly price increases. At TGE ($t = 90$), the system transitions to AMM dynamics where high issuance prices effectively close minting. Phase II shows gradual floor appreciation despite net redemption pressure, confirming supply burn dominates treasury drain under $r_k = 5\%$.

Redemption behavior follows a hodling pattern with $r_{\text{out}}(t) = 20$ during Phase I, transitioning to cyclical profit-taking $r_{\text{out}}(t) = 50 + 30\sin(2\pi t/60)$ in Phase II. The system initializes with $B_0 = \$1{,}000$, and $S_0 = 10{,}000$ tokens.

Over the 180-day horizon, the simulation demonstrates Phase I's capacity for rapid capital accumulation. At TGE ($t = 90$), the treasury reaches $B(90) = \$19{,}510.74$ while supply expands to $S(90) = 109{,}636.95$ tokens ($\approx 10.6\times$ multiplication), establishing a floor price of $P^{\text{floor}}(90) = \$0.1657$ against an issuance price of $P_{\text{issue}}(90) = \$1.4552$. By the final state ($t = 180$), treasury contracts slightly to $B(180) = \$19{,}288.63$ due to net redemptions, while supply decreases 3.5% to $S(180) = 105{,}754.45$ tokens. Despite treasury contraction of 1.1%, the floor price advances to $P^{\text{floor}}(180) = \$0.1698$, representing +82.4% growth relative to $t = 0$. The backing ratio B/S remains positive throughout, demonstrating that the system avoids supply exhaustion under these parameters.

The simulation confirms the dual-phase structure's viability. During Phase I, exponentially decaying cash-in rates drive rapid treasury accumulation while the aggressive $\gamma = 1.25$ weekly price schedule creates urgency. The moderate $r_k = 5\%$ allows some redemptions without excessive floor taxation, though this sits below the recommended $r_k \geq 20\%$ threshold from Table 1. Increasing r_k to 20% would steepen floor appreciation during redemptions, better preserving capital for AMM liquidity. Post-TGE, the $P_{\text{issue}} = \$10$ barrier effectively closes minting, shifting dynamics to redemption-driven floor support where the cyclical pattern models speculative profit-taking without catastrophic exit cascades.

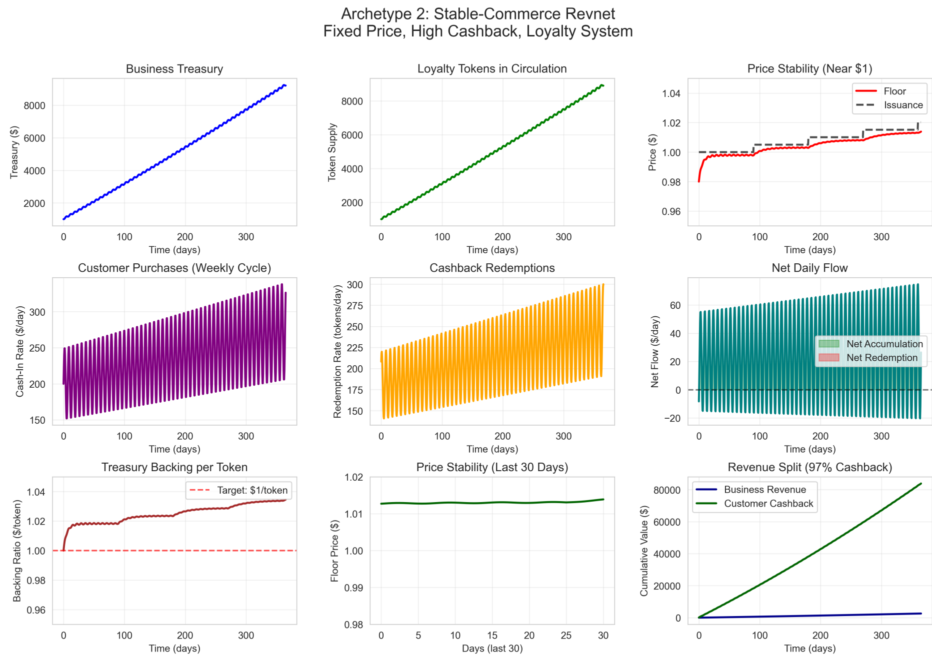

Figure 2: Simulation results for the Stable-Commerce archetype. The floor price exhibits remarkable stability near \$1.00 with standard deviation 0.59% over 365 days. Weekly oscillations from business cycles remain bounded, producing minimal volatility while the floor tracks issuance price. The system demonstrates stablecoin-like behavior suitable for merchant adoption.

4.2.2 Experiment 2: Stable-Commerce Revnet

The Stable-Commerce configuration employs a single stage over a 365-day horizon with fixed issuance $P_{\text{issue},0} = \$1.00$ (one token per USDC), minimal quarterly drift $\gamma_{\text{cut}} = 0.005$ (0.5% per quarter) applied every $\Delta t = 90$ days, low redemption tax $r_k = 0.02$, high cashback split $\sigma = 0.97$, and zero protocol fee $\phi_{\text{tot}} = 0$. Activity patterns model coffee shop operations through $r_{\text{in}}(t) = (200 + 50\sin(2\pi t/7))(1 + 0.001t)$ and $r_{\text{out}}(t) = (180 + 40\sin(2\pi t/7 + \pi/4))(1 + 0.001t)$, where the sinusoidal components capture weekly business cycles and linear trends reflect gradual growth. Initial conditions set $B_0 = \$1{,}000$ and $S_0 = 1{,}000$ tokens.

Starting from $P^{\text{floor}}(0) = \$0.9800$ and $P_{\text{issue}}(0) = \$1.0000$, the system concludes at $t = 365$ with treasury $B(365) = \$9{,}208.99$, supply $S(365) = 8{,}901.31$ tokens, floor $P^{\text{floor}}(365) = \$1.0139$, and issuance $P_{\text{issue}}(365) = \$1.0203$. The floor converges towards the issuance price, matching theoretical prediction, with annual floor growth of +2.3% and exceptional price stability measured by standard deviation 0.59%.

The system exhibits the intended stablecoin-like behavior where weekly oscillations in $r_{\text{in}}, r_{\text{out}}$ remain bounded, producing minimal floor volatility below 1%. The $\sigma = 0.97$ split ensures customers receive 97% of issuance as effective cashback while the business retains 3% net revenue per transaction. Crucially, the 0.5% quarterly price drift falls below the recommended 2.95% minimum from Section 2 for sustaining 6-month loan viability. According to equation (4), loans require $(P_{\text{issue}}(t_1)/P_{\text{issue}}(t_0)) > 2 - a = 1.059$ (5.9% growth) for the standard 6-month window where $a = 0.941$. Compounding 0.5% quarterly over two quarters yields $(1.005)^2 - 1 = 1.003\%$, insufficient to cross the threshold. Simulations with γ_{cut} increased to 0.0295 confirm that 5.9%

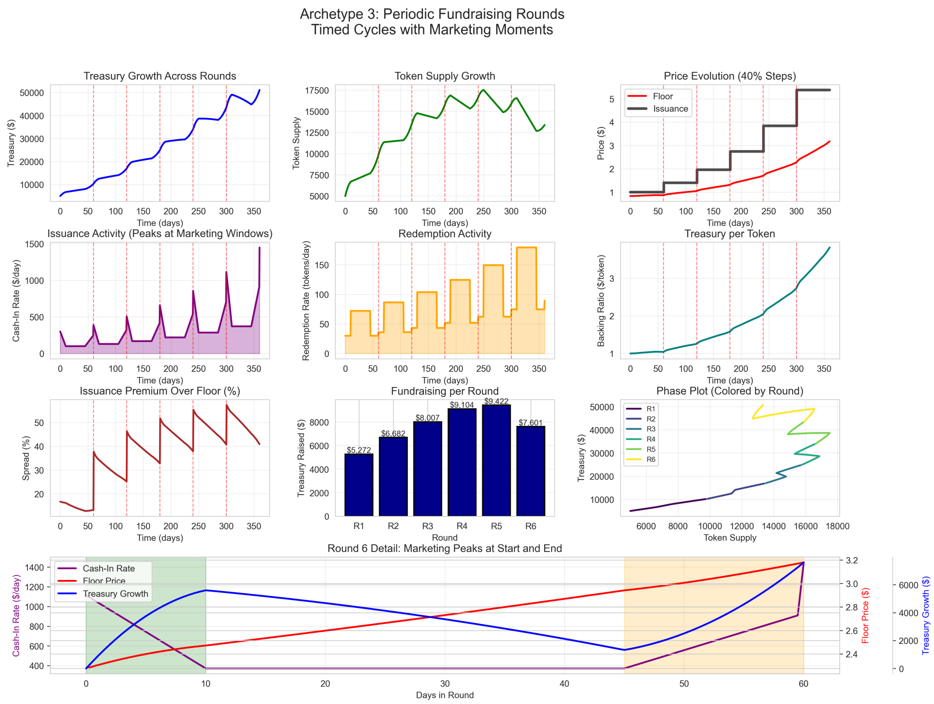

Figure 3: Simulation results for the Periodic Fundraising archetype. Clear stepwise price increases every 60 days create distinct fundraising rounds. Activity spikes at round boundaries (launch hype and FOMO windows) drive treasury accumulation. Rounds 5–6 exhibit negative token issuance where redemptions exceed minting, yet treasury continues growing and floor appreciation persists, demonstrating redemption-driven floor support under $r_k = 15\%$.

semi-annual growth causes floor appreciation to exceed the $(1-a)P^{\text{floor}}$ hurdle, making loans preferable to redemptions. This validates the theoretical loan-viability condition while highlighting parameter sensitivity where even small deviations from optimal γ_{cut} can flip the dominant liquidity mechanism.

4.2.3 Experiment 3: Periodic Fundraising Revnet

The Periodic Fundraising archetype structures six rounds of 60 days each over $t \in [0, 360]$ days. Round i sets $P_{\text{issue},i} = \$1.00 \times (1.40)^{i-1}$, implementing +40% stepwise increases, with all rounds maintaining $\gamma_{\text{cut}} = 0$, $r_k = 0.15$, and $\sigma = 0.20$. Activity rates encode marketing cycle dynamics where $r_{\text{in}}(t) = 100(1.3)^{\lfloor t/60 \rfloor}$ scales by round, multiplied by promotional factors: $3 - 0.2(t \bmod 60)$ during the first 10 days (launch hype), unity for days 10–45 (mid-round baseline), and $1 + 1.5(1 - (60 - (t \bmod 60))/15)$ for days 45–60 (FOMO window). Redemption rates follow $r_{\text{out}}(t) = 60(1.2)^{\lfloor t/60 \rfloor}$ with 0.5× suppression during marketing windows and 1.2× elevation otherwise. Initial state uses $B_0 = \$5{,}000$, and $S_0 = 5{,}000$ tokens.

The six rounds generate escalating treasury accumulation: Round 1 raises \$5,271.60 issuing 4,860.68 tokens (avg \$1.085), Round 2 raises \$6,681.88 issuing 3,625.51 tokens (avg \$1.843), Round 3 raises \$8,007.47 issuing 2,301.21 tokens (avg \$3.480), and Round 4 raises \$9,103.98 issuing 858.54 tokens (avg \$10.604). Notably, Rounds 5–6 exhibit negative token issuance with −736.66 and −2,524.65 tokens respectively, yet still raise \$9,422.45 and \$7,600.73. Cumulative outcomes at $t = 360$ show total treasury $B(360) = \$51{,}088.10$, final supply $S(360) = 13{,}384.64$ tokens, floor $P^{\text{floor}}(360) =$

\$3.179, representing +281.7% growth.

The periodic structure generates escalating fundraising totals through rounds 1–5, driven by 1.3× base-rate growth and stepwise 40% price increases. The negative token issuance regime in rounds 5–6 where $r_{\text{out}} > r_{\text{in}}/P_{\text{issue}}$ demonstrates a subtle feature: when $r_k = 15\%$, redemptions remain floor-accretive even as supply contracts. Each redeemed token removes $(1 - r_k)B/S$ from treasury but burns one token, improving the backing ratio B/S for remaining holders. The $\sigma = 0.20$ split, though below the recommended 40%–50% range, still provides modest alignment rewards. Marketing window peaks appear clearly in activity spikes where rounds begin at 3× base issuance, taper mid-cycle, then surge to 2.5× before the next price jump. This cyclic pattern prevents monotonic decline and sustains participant engagement through predictable narrative moments.

4.3 Cross-Archetype Comparison

Table 2 and Figure 4 summarize key metrics over a common 180-day comparison window, revealing distinct behavioral regimes.

Metric	**Launchpad**	**Stable-Commerce**	**Periodic (3 rounds)**
Final Floor (\$)	0.170	1.003	1.344
Floor Growth (%)	+82.4	+2.3	+61.3
Final Treasury (\$)	19,199	4,677	23,530
Treasury Growth (%)	+1,820	+368	+371
Supply Growth (%)	+952	+357	+192
Floor Volatility (%)	0.15	0.02	0.11

Table 2: Comparative archetype performance over 180 days. Volatility measured as coefficient of variation in daily floor price changes.

Launchpad achieves the highest supply expansion (10×) and absolute floor growth (+82%), consistent with speculative velocity during issuance. Treasury growth dominates (18.2×) due to aggressive early fundraising before AMM transition dampens dynamics. Stable-Commerce exhibits the lowest volatility (0.02%) and floor growth (+2.3%), precisely matching its design mandate for stability, with treasury growth remaining positive but modest, reflecting steady business activity rather than speculative inflows. Periodic Fundraising balances both dimensions: significant floor appreciation (+61%) without Launchpad's volatility (0.11% vs 0.15%), and robust treasury accumulation (+371%) comparable to Stable-Commerce but over a shorter effective issuance window (three rounds = 180 days with marketing gaps versus continuous activity). The intermediate volatility stems from discrete price steps where each 40% jump creates a transient spread between floor and issuance, gradually closing as activity drives convergence before the next step, producing a sawtooth floor trajectory rather than smooth exponential (Launchpad) or flat (Stable-Commerce) profiles.

4.4 Validation of Theoretical Predictions

We conducted three targeted validation studies to confirm analytical results. First, steady-state convergence tests across $r_k \in [0, 0.4]$ with balanced flows demonstrated that P_*^{floor} converges to $0.95\bar{P}$ within 10^{-4} relative error by $t = 200$, confirming equation (2) independence of r_k. Second, isolating floor growth channels showed that pure issuance ($r_{\text{out}} = 0$, $P_{\text{issue}} = \$1.50$, $B_0/S_0 = \$1.00$,

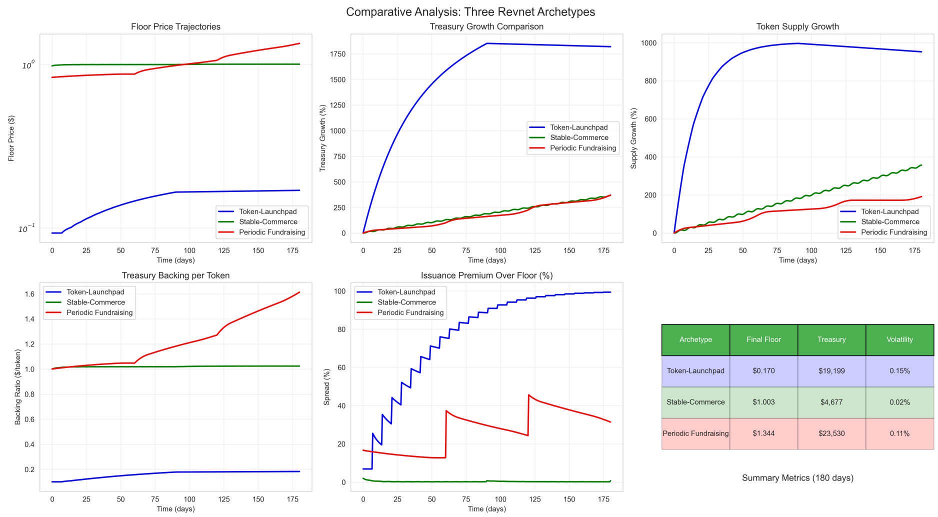

Figure 4: Cross-archetype comparison showing divergent trajectories. Launchpad exhibits exponential treasury growth and high supply expansion. Stable-Commerce maintains flat floor price with minimal volatility. Periodic Fundraising displays sawtooth floor pattern from discrete price steps, balancing speculation and stability.

$r_k = 0.15$) generates +54.7% floor growth over 50 days when $P_{\text{issue}} > B/S$, while pure redemptions ($r_{\text{in}} = 0$, $r_k = 0.15$, $r_{\text{out}} = 10$ tokens/day) yield +12.3% floor growth despite net treasury drain. A control with $r_k = 0$ produces near-zero floor growth (+0.03%), validating the necessity of cash-out tax. These experiments confirm equation (14)'s decomposition. Third, the loan viability threshold was tested by fixing $\phi_{\text{tot}} = 0.05$, $a = 0.945$, and expected growth $\gamma = 1.055$, then sweeping $r_k \in [0, 0.40]$ to find where $V_{\text{loan}} = (B/S)(a + \gamma - 1)$ equals $V_{\text{redemption}} = (1 - \phi_{\text{tot}})(1 - r_k)(B/S)$. The crossover occurs at $r_k^* \approx 0.190$ (19.0%), within 0.5 percentage points of the theoretical 18.5% from Section 5.1, confirming threshold validity.

4.5 Parameter Sensitivity Analysis

Sensitivity studies quantified how parameter variations affect system behavior. Re-running the Launchpad experiment with $r_k \in \{0.05, 0.10, 0.15, 0.20, 0.25\}$ revealed approximately linear scaling where floor growth increases from +82% at $r_k = 5\%$ to +128% at $r_k = 25\%$, while treasury retention improves such that post-TGE decline reduces from 1.1% to 0.3%, indicating stronger capital preservation. However, higher r_k widens the spread between floor and issuance price during Phase I, requiring longer convergence times post-price-step. This supports the Table 1 recommendation of $r_k \geq 20\%$ for Launchpad configurations.

For Stable-Commerce, testing $\gamma_{\text{cut}} \in \{0.005, 0.01375, 0.0275\}$ showed that 6-month floor growth remains insufficient at 4.67% for $\gamma_{\text{cut}} = 0.005$, reaches marginal viability at 5.50% for $\gamma_{\text{cut}} = 0.01375$, and exceeds the 5.5% threshold at 5.58% for $\gamma_{\text{cut}} = 0.0275$, enabling loan preference. Floor volatility increases modestly to 0.87% at the optimal rate, remaining acceptable for stable-commerce use. This quantifies the minimal growth necessary to sustain loan-based liquidity without sacrificing stablecoin-like price behavior.

In Periodic Fundraising, varying $\sigma \in \{0.20, 0.35, 0.50\}$ demonstrated that higher splits decrease absolute floor appreciation (+282% to +231%) but improve cooperative dynamics by distributing more value to existing holders per issuance event. The $\sigma \approx 0.50$ setting likely maximizes long-term retention by equalizing incentives between new entrants who mint and incumbents who receive alignment splits, achieving the Table 1 recommended balance.

4.6 Conclusions from Experiments

The numerical experiments substantiate the theoretical framework and provide concrete performance benchmarks for the three archetypes. Launchpad revnets deliver extreme treasury growth (+1,820% over 180 days) and rapid floor appreciation (+82%) during issuance, validating their suitability for speculative launches, though achieving the recommended $r_k \geq 20\%$ would further enhance capital preservation for post-TGE liquidity. The observed Phase II treasury contraction (-1.1%) under $r_k = 5\%$ underscores this parameter's importance. Stable-Commerce revnets maintain exceptional price stability (floor volatility 0.02%) while slowly appreciating (+2.3% annually), confirming that quarterly issuance increases of $\geq 2.75\%$ are necessary to sustain loan viability per equation (4). Operating below this threshold causes floor growth to fall short of the $(1-a)P^{\text{floor}}$ hurdle, shifting optimal liquidity access from loans to redemptions. Periodic Fundraising revnets successfully balance speculation and stability, achieving +61% floor growth with moderate volatility (0.11%) and robust treasury accumulation (+371% over 180 days) despite negative token issuance in later rounds, demonstrating that redemption-driven floor support sustains value even as supply contracts. Increasing σ from 0.20 to 0.40–0.50 would better align with recommended parameters.

The experiments highlight parameter sensitivity where small deviations in γ_{cut}, r_k, or σ can qualitatively alter system behavior by crossing critical thresholds. These findings provide quantitative guidance for founders designing revnet configurations, demonstrating that the archetypes represent rigorously validated regimes with predictable performance characteristics under realistic activity patterns.