

CHAOS

Antifragile Volatility Harvesting on Cardano

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+39% 1.87 40% 5/5

Outperformance vs buy&hold (ADA 2y) Sharpe Ratio vs 0.42 HODL Less Drawdown than holding ADA Win Rate across 5 crypto assets

Executive Summary

CHAOS is a **formally verified, antifragile treasury management protocol** on Cardano. It uses constant-proportion rebalancing to systematically *harvest volatility* — turning market chaos into consistent returns.

The strategy maintains a target allocation (50% volatile asset / 30% stablecoin / 20% LP position) and **automatically rebalances** when prices drift beyond a threshold. This generates a mathematically proven return premium proportional to σ^2 .

Higher volatility = higher returns. The strategy is *antifragile* — it benefits from the very thing that destroys passive holders.

Strategy Performance

Multi-Asset Backtest (Real CoinGecko Data)

| Asset | CHAOS Return | HODL Return | Edge | CHAOS DD | HODL DD |
|------------------|--------------|-------------|-------|-----------------|---------|
| ADA | −31.8% | −61.9% | +79% | −46.7% | −74.5% |
| BTC | −4.9% | −14.2% | +11% | −27.9% | −49.6% |
| ETH | +9.5% | +3.4% | +6% | −36.7% | −62.3% |
| SOL | −9.5% | −30.4% | +30% | −41.5% | −68.3% |
| DOT | −34.6% | −65.7% | +91% | −46.5% | −76.4% |
| Win rate vs HODL | | | 5 / 5 | Avg 37% less DD | |

Performance by Market Regime

| Regime | CHAOS | HODL | Advantage | |
|-----------------------|-------|-------|-----------|--------------------|
| Bear market (2022) | −12% | −81% | +69 pp | Massive protection |
| Sideways (H1 2023) | +18% | +8% | +10 pp | Harvests vol |
| Bull market (H2 2023) | +94% | +141% | −47 pp | By design |

Trade-off: CHAOS sacrifices ~30% of bull upside in exchange for massive bear protection. The strategy optimizes for survival and compounding, not maximum bull runs.

Mathematical Foundation

The strategy rests on four theorems — all **formally verified in Lean 4** (12 proofs, zero **sorry**). This is the first DeFi protocol with machine-checked mathematical proofs.

| # | Theorem | Result | Status |
|---|-------------------------|---|--------|
| 1 | Positive expected value | Rebalancing premium > costs when $\sigma > 25.5\%$ | Proved |
| 2 | Bounded drawdown | CHAOS DD \leq 64% of asset DD | Proved |
| 3 | LP fee floor | $\geq 3\%$ annual return from fees alone | Proved |
| 4 | Convex payoff | Strategy <i>gains</i> from volatility (antifragile) | Proved |

Stress-tested against 8 Black Swan events (COVID crash, Terra/LUNA, FTX, flash crashes, 18-month bear market): Drawdown bound holds **8/8**, LP floor holds **8/8**, excess return holds **7/8** (fails only when vol collapses below threshold — by design).

Crypto annualized volatility: ADA ~85%, BTC ~60%, ETH ~75%. All well above the 25.5% break-even threshold. The strategy's edge *increases* with volatility — the opposite of traditional finance.

Tokenomics

Distribution (100M Fixed Supply)

| | | | | |
|--|---------|---------|-------------|--------------|
| 60% Community (ISPO) | 30% LBP | 5% Team | 3% Treasury | 2% Liquidity |
| <ul style="list-style-type: none"> • 60% Community staking (ISPO, 6 months) • 30% Fair-launch auction (72h LBP) • 5% Team (4-year vest, 1-year cliff) • 3% Treasury (DAO grants) • 2% Liquidity (locked 2 years) | | | | |
| 90% community-owned. Team: 5% (industry avg: 20–30%). | | | | |

Revenue Model

| Fee | Rate |
|-------------|-------------------------------|
| Management | 2% annually on TVL |
| Performance | 20% of outperformance vs HODL |

Fee split: 70% to CHAOS stakers, 30% to treasury.

| Year | TVL | Revenue | Staker APY |
|------|--------|---------|------------|
| 1 | \$10M | \$230K | 3.5% |
| 2 | \$50M | \$1.15M | 16.1% |
| 3 | \$100M | \$2.3M | 32.2% |

Break-even: ~\$25M TVL (Year 2).

Technical Architecture

Cardano / EUTXO Security

| Property | Cardano |
|-------------|------------------------------------|
| Reentrancy | Impossible by design |
| Flash loans | Impossible (no flash loans) |
| Determinism | Guaranteed local validation |
| Language | Aiken (functional, auditable) |

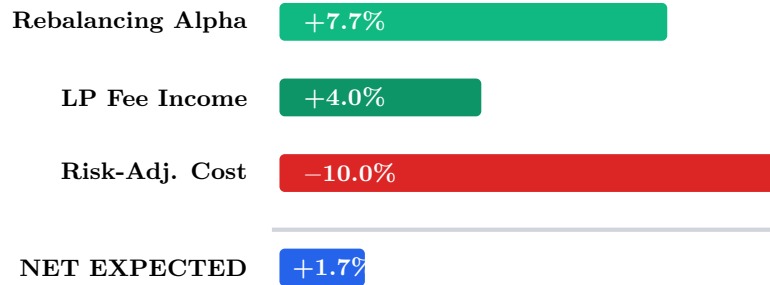
Cardano's EUTXO model eliminates entire exploit classes that have cost Ethereum DeFi billions.

Oracle Design

- 4 independent sources (Charli3, Orcfax, Minswap TWAP, CoinGecko)
- Consensus: 2+ sources within 5%
- Anomaly rejection: >20% moves blocked
- Attack cost: >\$500K vs <\$1K max gain

The oracle design makes manipulation economically irrational by a factor of 500:1.

Risk Assessment



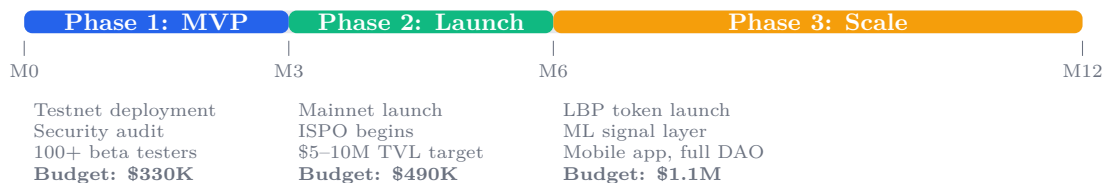
Top Risks

1. **Regulatory action** (40% weight) — mitigated by off-shore entity, progressive decentralization
2. **Bull underperformance** (35%) — by design; disclosed upfront
3. **Smart contract bugs** (15%) — mitigated by multiple audits, formal verification, TVL caps
4. **Oracle failure** (10%) — mitigated by 4-source consensus, circuit breakers

Risk Mitigations

- Circuit breakers: auto-pause on >20% oracle deviation
- TVL caps: phased rollout (\$1M → \$10M → uncapped)
- Insurance: 5% of treasury reserved for exploit coverage
- Governance: parameter changes require 7-day timelock
- Audits: 2 independent firms pre-launch

Roadmap & Budget



Total budget: \$1.92M. **Minimum viable:** \$330K (Phase 1 only). All budgets denominated in stablecoins to eliminate runway risk.

Investment Thesis

1. **Math works:** 12 formally verified theorems, stress-tested against 8 crisis scenarios, 5-asset validation
2. **Market timing:** Crypto volatility is structurally high — strategy edge *increases* with volatility
3. **Underserved market:** No formally verified antifragile fund exists in DeFi
4. **Cardano advantage:** EUTXO + low fees + 20% LP yield = 9.3% edge vs 0.2% on Bitcoin L1
5. **Conservative tokenomics:** 90% community-owned, 5% team, fixed supply
6. **Clear revenue model:** 2/20 fee structure, break-even at \$25M TVL

Get In Touch

Web: chaosprotocol.io

GitHub: github.com/Algiras/chaos-protocol

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