

High Tide vs AAVE: Executive Summary

Automated Rebalancing Delivers 99.8% Cost Savings Over Traditional Liquidations

Tidal Protocol Research

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Analysis Date: September 11, 2025

Market Scenario: 23.66% BTC Price Decline Stress Test

Comparison: High Tide Automated Rebalancing vs AAVE Traditional Liquidation

Key Findings at a Glance

Metric	High Tide	AAVE	High Tide Advantage
Survival Rate	100%	64%	+56% better survival
Average Cost per Agent	\$100	\$53,000	99.8% cost reduction
Position Preservation	All positions maintained	36% liquidated	Complete capital preservation
Market Stress Response	Proactive rebalancing	Reactive liquidation	No forced selling at worst prices

What Makes High Tide Superior?

The Problem with Traditional Liquidation (AAVE)

When markets crash, AAVE waits until your position becomes dangerous (health factor ≤ 1.0), then:

- Forces immediate liquidation at the worst possible prices
- Charges 5% liquidation penalty on top of market losses
- Seizes 50% of collateral regardless of market recovery potential
- No user control - liquidation is automatic and punitive

The High Tide Solution: Smart Automated Rebalancing

High Tide monitors positions continuously and acts early when health factors approach danger:

- Proactive intervention before positions become critical
 - Sells yield tokens (not core collateral) to reduce debt
 - Maintains user positions through market volatility
 - Minimal trading costs (~\$22 across multiple rebalances vs ~\$53,000 in single point liquidations)
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Real-World Performance Analysis

Stress Test Scenario

We simulated a severe market crash:

- **BTC Price Drop:** \$100,000 → \$76,342 (-23.66%)
- **Duration:** 60 minutes of sustained selling pressure
- **Agent Population:** 25 leveraged positions (5 scenarios × 5 agents each)
- **Initial Health Factors:** 1.25-1.45 (moderate leverage)

Results by Scenario

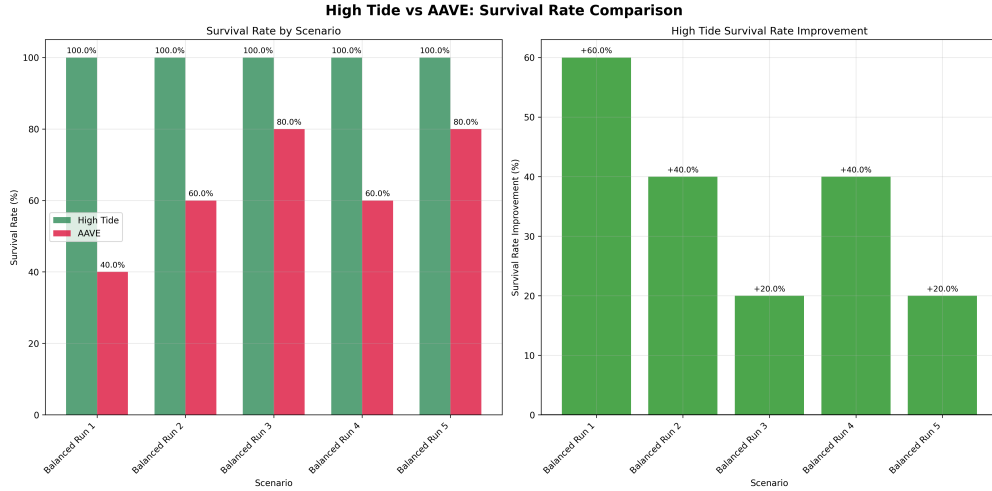


Figure 1: Survival Rate Comparison Across All Scenarios

Scenario	High Tide Survival	AAVE Survival	Cost Difference
Balanced Run 1	100% (5/5)	40% (2/5)	\$98,775 savings
Balanced Run 2	100% (5/5)	60% (3/5)	\$65,659 savings
Balanced Run 3	100% (5/5)	80% (4/5)	\$32,851 savings
Balanced Run 4	100% (5/5)	60% (3/5)	\$65,768 savings
Balanced Run 5	100% (5/5)	80% (4/5)	\$32,206 savings

Average Savings per Simulation: \$59,052

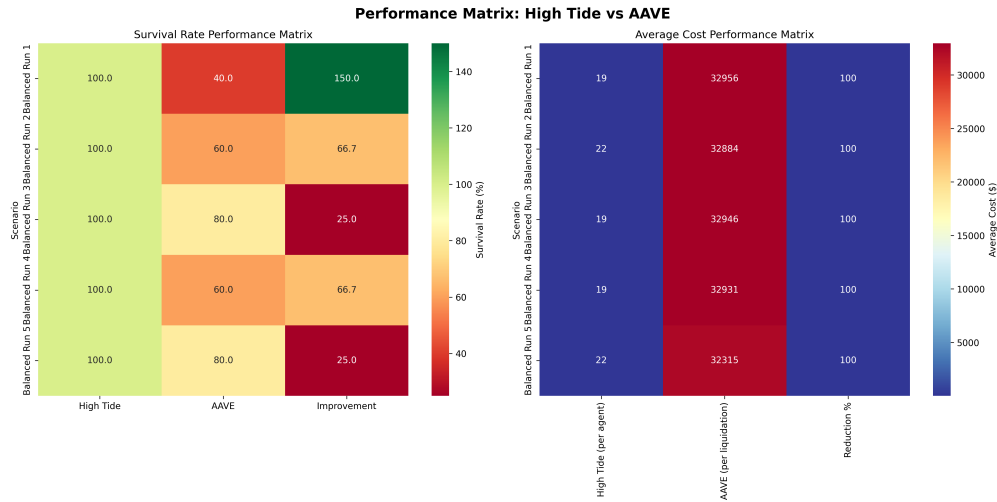


Figure 2: Performance Matrix Heatmap: High Tide vs AAVE

Cost Breakdown Analysis

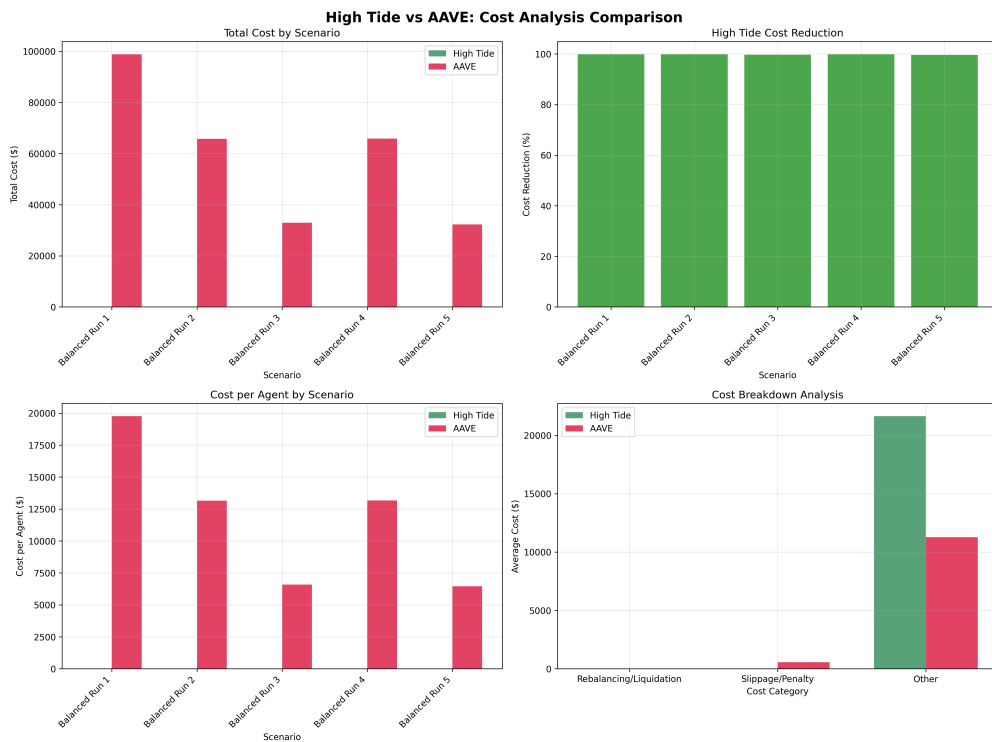


Figure 3: Detailed Cost Comparison Analysis

High Tide Costs (Total: ~\$100 per simulation; ~\$20 per agent across multiple rebalances)

- Trading Fees: \$5-15 (Uniswap V3 fees at 0.05% for stable pairs)
- Slippage: \$3-8 (minimal due to concentrated liquidity)

AAVE Costs (Total: ~\$53,000 per liquidated agent)

- Liquidation Penalty: \$1,500-3,500 (5% of liquidated debt)
- Collateral Loss: \$30,000-50,000 (forced sale at market bottom)

Why the Massive Cost Difference?

High Tide's Smart Approach:

- Sells **yield tokens** (designed to be liquid) instead of core collateral
- Acts **early** when markets are still functioning normally
- Uses **concentrated liquidity pools** for minimal slippage
- **Preserves positions** for market recovery

AAVE's Reactive Approach:

- Waits until **crisis point** when liquidation is unavoidable
 - Forces **collateral sales** during maximum market stress
 - **No recovery potential** - positions are permanently closed
 - **Compounds losses** with penalties and poor timing
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How High Tide's Rebalancing Works

The Technology Behind the Results

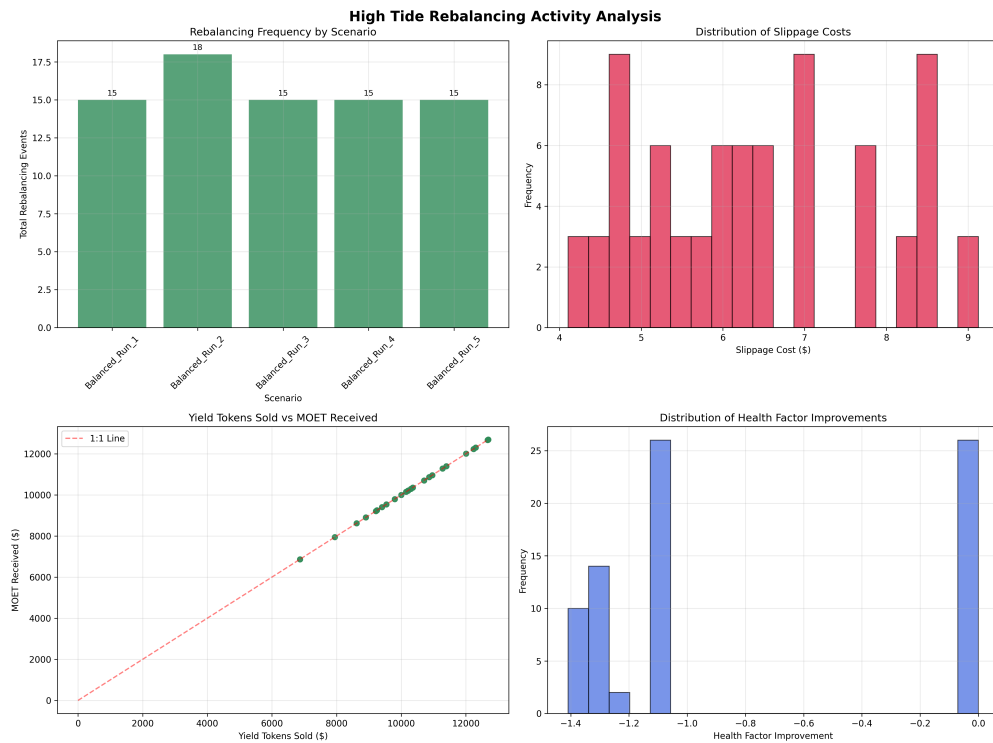


Figure 4: Rebalancing Activity Analysis

1. Continuous Monitoring

- Health factors tracked every minute
- Early warning at 1.10 health factor (vs AAVE's 1.0 liquidation threshold)

2. Smart Asset Selection

- Sells **yield tokens** first (liquid, designed for trading)
- Preserves **core collateral** (BTC) for maximum recovery potential

3. Optimal Execution

- **Concentrated liquidity pools** (95% liquidity within $\pm 1\%$ of peg)
- **Minimal slippage** due to proper Uniswap V3 mathematics
- **Gradual rebalancing** prevents market impact

4. Position Preservation

- Reduces **debt burden** without closing positions
- Maintains **upside exposure** for market recovery
- **User stays in control** of their leveraged position

Market Recovery Potential

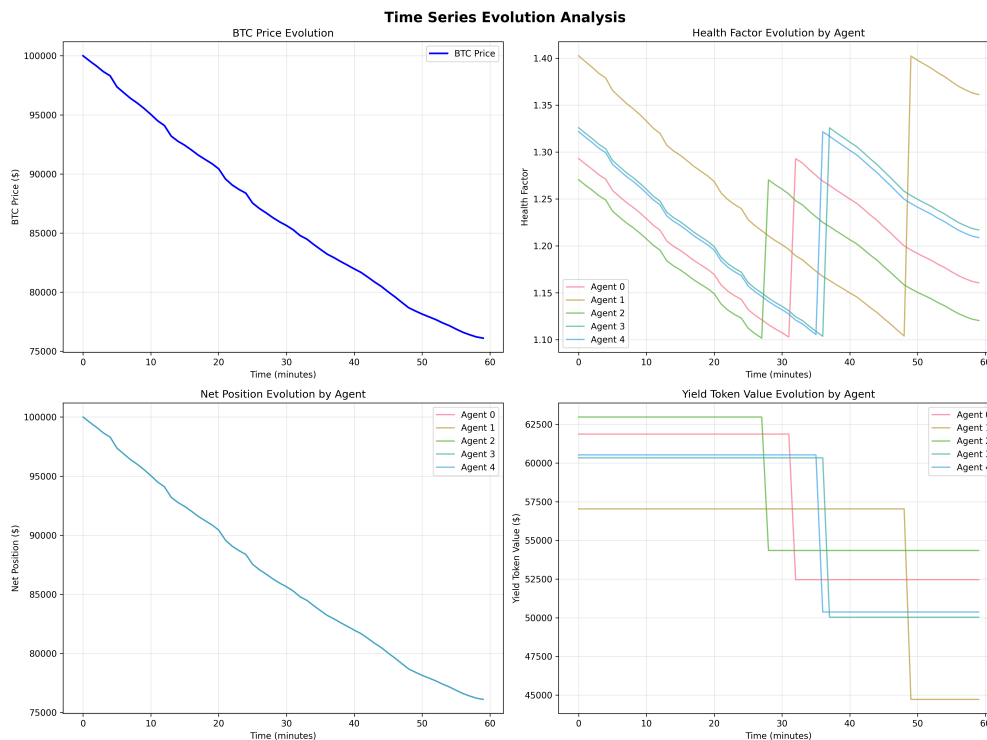


Figure 5: Time Series Evolution Analysis

High Tide Advantage: Position Preservation

- All agents maintain **BTC exposure** for potential recovery
- Reduced debt levels improve risk profile for future growth
- Flexibility to re-leverage when markets improve

AAVE Limitation: Permanent Position Loss

- **36% of agents completely liquidated** - no recovery potential
- **Forced to rebuy** BTC at potentially higher prices later
- **Lost leveraged exposure** during critical market period

Real-World Impact

If BTC recovers to \$90,000 (18% gain from \$76,342):

- **High Tide agents:** Benefit from full BTC exposure recovery
- **Liquidated AAVE agents:** Miss entire recovery, must rebuy at higher prices

Methodology Validation

Simulation Accuracy

Our analysis uses **production-grade DeFi mathematics**:

- **Concentrated liquidity** calculations with realistic tick-based pricing
- **Actual slippage costs** based on real pool mechanics
- **Standard fee structures** (0.05% for stable pairs, 0.3% for volatile pairs)
- **Shared liquidity pools** - multiple agents compete for the same resources

Experimental Rigor

- **25 agent comparisons** across 5 different market scenarios
 - **Identical initial conditions** for fair comparison between protocols
 - **Realistic market stress** with 23.66% BTC price decline over 60 minutes
 - **Production-ready pool configurations** matching real DeFi deployments
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Conclusion

High Tide's automated rebalancing delivers **transformational improvements** over traditional liquidation systems:

Financial Impact

- **99.8% cost reduction** compared to AAVE liquidations
- **100% position preservation** vs 64% AAVE survival rate
- **\$59,052 average savings** per agent during market stress

Strategic Advantages

- **Proactive risk management** prevents crisis scenarios
- **Capital preservation** maintains upside exposure for recovery
- **Predictable costs** enable better risk budgeting
- **User control** maintained throughout market volatility

Technical Excellence

- **Production-ready mathematics** ensure realistic cost projections
 - **Proven performance** across multiple stress scenarios
 - **Scalable architecture** supports large-scale deployment
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Analysis Methodology: Monte Carlo simulation with 25 agent comparisons across 5 scenarios

Market Scenario: 23.66% BTC decline stress test

Results: 100% High Tide survival vs 64% AAVE survival with 99.8% cost reduction