HYPE Parameters Review

Anthias labs for Hyperstable

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Overview

This report reviews the settings Hyperstable applied to the HYPE collateral market, comparing them to the recommendations Anthias Labs gave prior to launch. For each parameter, this report details: our recommendations, Hyperstable's current parameters, the risk implications, and any suggested adjustments. The goal is to give a clear set of changes that will keep the system safe while enabling capitally-efficient borrowing.

Evaluation

The table below summarizes the recommended vs. live values for HYPE collateral parameters:

Parameter	Recommended value	Live value
Minimum Collateralization Ratio (MCR) – Vault	140%–160%	150%
Debt Threshold Percentage (Buffer)	3%–7% of total HYPE-backed USH debt	5% of HYPE-backed USH debt
Liquidation Reward (Liquidator Bonus)	Dynamic formula (13% of remaining collat. at 150% CR)	5% of debt (10% of remaining collateral)
Buffer Reward (Protocol Cut)	15–25% of remaining collateral	11.25% (25% of remaining collateral)
Target Utilization	70%–85%	82.5%
Curve Steepness	5	4
Adjustment Speed (k_p)	50% per year	50% per year
Initial Rate at Target	5% APR	1% APR
Minimum Rate at Target (Rate curve Floor)	3% APR	0% APR
Maximum Rate at Target (Rate curve Cap)	50% APR (max borrow at u_{target} under stress)	2% APR
Manual Interest Rate (Peg IRM fallback)	2% APR (temporary fix until peg IRM active)	4.20%–5.2% APR
Peg IRM Update Period	4 hours	30 minutes
Peg IRM Interest Coefficient	5 APR-points per 1% USH peg deviation (per 4 h)	0.25 APR-points per 1% deviation (per 30 min)

Table 1: Recommended parameters and the live parameters

Risk Parameters

0.1 Minimum Collateralization Ratio (MCR)

Recommended: 140–160% (suggested targeting ~150% for HYPE's risk profile)
Used: 150%

Analysis

The protocol sets MCR at 150%, which is in line with recommendations and adequately protects the system. It should be periodically reviewed as HYPE's volatility and market depth evolve, but for now it's on target.

Verdict

No changes required, but suggested to continuously monitor the HYPE market.

0.2 Debt Threshold Percentage (Buffer)

Recommended: 3–7% of total HYPE-backed debt
Used: 5%

Analysis

Hyperstable configured the debt buffer (the portion of total debt tolerated before liquidations flow to the safety buffer) at 5%, which sits comfortably within our suggested 3–7% range.

Verdict

No change required. The 5% debt buffer is perfectly aligned with our recommendation.

0.3 Liquidation Reward (Liquidator Bonus)

Recommended: Dynamic formula, equivalent to 13% (for HYPE), (can be different for other collaterals) of remaining collateral at 150% CR (i.e. 10% + (AV/40) + 1.25% based on asset volatility AV and collateral ratio).
Used: Fixed 5% of debt (which equates to about 10% of leftover collateral at 150% CR).

Analysis

The shipped liquidation bonus is about 10% of remaining collateral, slightly lower than the ~13% we estimated via our dynamic risk-based formula for HYPE. A lower liquidation reward means liquidators earn a bit less per event, but HYPE's liquidity and volatility profile arguably justify not straying too high.

Verdict

No immediate change required. The current 5% of debt reward is acceptable and within a reasonable range for liquidator incentives. If data later shows that positions under MCR are not being liquidated immediately or taking much longer than they should, then we may revisit this. In the long run, consider increasing toward 12-13% of collateral (about 6% of debt). The lower liquidation rewards(4-5% of the debt) would discourage the liquidators to participate in the liquidations because that might not be sufficient to cover for the slippage while the higher liquidation rewards (6-7% of the debt) would encourage the liquidators to liquidate the positions so as to make high profit from the liquidations while being more comfortable as the slippage tolerance is more.

0.4 Buffer Reward (Protocol Cut from Liquidations)

Recommended: 15-25% of remaining collateral
Used: 25% of the remaining collateral

Analysis

Hyperstable allocated 25% of the remaining collateral to the protocol's stability buffer, at the higher end of our recommended 15-25% range. In practical terms, at 150% CR, the protocol currently captures roughly an extra 5% of the loan value from the collateral over our recommendation. A higher buffer cut serves to cover bad debt and system losses in case collateral auctions fail to fully repay loans. Our rationale was to maximize funds available to absorb rare losses, since liquidations are infrequent. The downside of a high buffer reward is that it penalizes borrowers more during liquidation (leaving them with less residual collateral), which could deter future use if seen as overly harsh.

Verdict

Change suggested. We recommend decreasing the buffer reward to at least 15% of remaining collateral, and with a max roof of up to 20%. This adjustment would improve the protocol's safety net without exceeding industry norms (20% buffer is high but justifiable for volatile assets).

Conclusion

Hyperstable started strong on their risk profile, through their MCR of 150% and Debt Threshold Percentage of 5%. These settings strike a smart balance, offering solid protection against the price volatility of HYPE while keeping things efficient for users. There is room to tweak things - the Liquidation Reward is on the slightly lower side compared to what's typical, which might slow down liquidations when the market goes haywire, bumping these up could make the system tougher, and the buffer reward is on the slightly higher side which needs to be adjusted downwards. Plus, as markets shift and asset volatility changes, it is suggested to revisit the MCR and Debt Threshold Percentage now and then to keep that risk-efficiency balance on point.

Interest Rate Model (IRM) Parameters

0.5   Target Utilization

Recommended: 70–85%
Used: 82.5%

Analysis

The chosen target utilization of 82.5% lies at the upper end of our suggested range. This means the adaptive interest rate model will aim to keep HYPE collateral usage around 82.5% of its maximum capacity. Currently, actual utilization is much lower (hovering $\tilde{4}5$–50% in the early stage), so there is ample headroom.

Verdict

No change required. We should watch utilization trends; if HYPE liquidity worsens or we approach this limit frequently, we might revisit lowering u_target.

0.6   Curve Steepness

Recommended: 5
Used: 4

Analysis

The interest rate curve steepness controls how aggressively borrowing rates spike as utilization moves away from the target. Hyperstable picked a value of 4, slightly under our recommended 5. In practical terms, this lower k makes the IRM curve a bit flatter, meaning rates will adjust more gradually. The difference between 4 and 5 here is not critical; both are in a moderate range. A k of 4 may result in marginally less volatile interest rate swings, which could be smoother for users. Given the other parameter choices (especially the current reliance on a manual rate), the slightly lower steepness is reasonable.

Verdict

No change required. The chosen curve steepness is close to our recommendation and works fine.

0.7 Adjustment Speed

Recommended: 50% per annum
Used: 50

Analysis

The adjustment speed parameter dictates how quickly the adaptive rate moves toward equilibrium when utilization is off target. Hyperstable set $k\_p = 50$, which we understand to correspond to 50%/year, matching our recommendations.

Verdict

No change required

0.8 Initial Rate at Target

Recommended: 5% APR
Used: 1% APR

Analysis

This parameter represents the starting point for the IRM working at the time of launch or whenever the rate is set to 0 again (which is very unlikely to happen).

Verdict

No changes suggested, as the protocol is already live and this param is of no use anymore.

0.9 Minimum Rate at Target (Interest Rate graph Floor)

Recommended: 3%
Used: effectively 0%

Analysis

The minimum interest rate curve is essentially the floor for the APR curve. We suggested a 3% floor so that even with low utilization for a longer period, there's a nominal cost to borrowing. In practice, what we've observed is that because the adaptive IRM can drop to 0%, the team has been compensating by using a manual interest rate (currently 4.2% APR to 5.2%) to ensure some baseline yield. They have already made frequent manual adjustments to this rate as the average health factor of the system fluctuates, essentially overriding the adaptive model to maintain safety. Relying on ad-hoc manual rate tweaks is not ideal long-term, and it stems from the floor being set too low (and the base rate being low), which renders the adaptive IRM "inefficient" at low utilization. We believe a modest positive floor (even 3%) would reduce the need for such manual intervention by guaranteeing that borrowing always incurs at least a small cost.

Verdict

Change recommended. We advise raising the minimum rate floor into the 3% - 4% APR range. It will also lessen the dependence on manually setting interest to maintain healthy utilization.

0.10 Maximum Rate at Target (Interest Rate Cap)

Recommended: 50% APR
Used: 2% APR

Analysis

The max rate at target utilization is meant to be the upper bound of the adaptive interest rate (at the target utilization point) during extreme demand or stress. We recommended a high cap of 50% APR (essentially allowing rates to skyrocket if needed to curb borrowing in extreme scenarios). Hyperstable's configuration caps the rate at 2% APR, which is dramatically lower. This means even if HYPE utilization goes above target, the adaptive IRM will never push the base borrow rate beyond 2% at 82.5% utilization (and even at 100% utilization it would only be modestly higher at 10%, which is not ideal as at 100% utilization it should be above at least 20-25%). Our view is that this undermines the whole purpose of an adaptive rate model, which is to dynamically respond to utilization and risk. Setting such a tight cap suggests Hyperstable is prioritizing keeping borrowing costs ultra-low, possibly to attract users, but it comes at the cost of lacking a pressure release valve. We strongly feel at least a double-digit APR cap is needed. Even 5% APR as a max at target would be a minimal improvement, though still far below our ideal.

Verdict

Change required. We recommend increasing the maximum rate at target to 5% APR in the near term, and consider a higher cap later. At 5%, the model regains some ability to react. Ultimately, a much higher cap (20–50%) is safer for extreme cases.

0.11 Manual Interest Rate

Recommended: 2% APR
Used: 4% APR (currently 5.2%)

Analysis

The manual interest rate is a fixed borrow rate the team can set while the Peg IRM is inactive or even when it is live. We suggested a low 2% APR, without overshadowing the adaptive IRM. Instead, Hyperstable chose 4%+ APR. The result is that the adaptive IRM's dynamics are largely muted, no matter what utilization does, the borrow rate stays around manual IR. While a $\tilde{4}$% APR is still relatively low in absolute terms, the concern is that it defeats the purpose of the adaptive curve, making it irrelevant until this manual rate is removed or lowered.

Verdict

Change recommended. We suggest tapering down the manual rate to $\tilde{2}$.0–2.5% APR, in stages if needed. This will gradually hand back control to the adaptive IRM while still keeping borrow rates reasonable. As the peg IRM comes online (with an oracle feed) and once the adaptive model's parameters are corrected, the manual rate can ideally be removed entirely or can be further reduced to 1-2% only to fully automate the interest rate. The goal is to have the system's interest rate be primarily rule-driven rather than manually managed, for robustness and responsiveness.

0.12 Peg IRM Update Period

Recommended: 4 hours
Used: 30 minutes

Analysis

The peg IRM update period is how often the interest rate can adjust based on USH's market price (once the Peg IRM is active). We advised a 4-hour interval to avoid excessive rate oscillation from short-term price noise. Hyperstable set a much shorter interval: 30 minutes. A 4h window smooths out fluctuations. The shipped choice indicates the team wanted a tight feedback loop on the peg, perhaps to correct any peg drift almost immediately. While proactive, this might introduce volatility in interest rates that could confuse users. We think a middle ground is better for stability.

Verdict

Change suggested. We recommend lengthening the Peg IRM update period to at least 1 hour. One hour adjustments would still be fairly responsive to genuine peg moves but filter out short-term noise better than 30 minutes. It's not urgent to change this now (since Peg IRM isn't enabled until an oracle is live), but before activation, the interval should be revisited.

0.13 Peg IRM Interest Coefficient

Recommended: 5 (APR% change per 1% deviation, per 4h)
Used: 0.25 (APR% change per 1% deviation, per 0.5h)

Analysis

The peg IRM coefficient determines how strongly the interest rate is adjusted in response to USH's price drifting from \$1. We proposed an aggressive coefficient of 5 (meaning a 5% APR change for each 1% price deviation, every 4 hours) to quickly counteract peg moves. Hyperstable's effective setting is 0.25% per 1% deviation per half-hour. Interestingly, given they also chose a shorter update period, the net effect is a smoother, more continuous adjustment, but smaller in magnitude per step. We find this conservative approach reasonable. Since USH is new and potentially not very volatile yet, a lighter touch could look perfect initially.

Verdict

No immediate change. The shipped peg coefficient (with its shorter interval) is about half of our originally intended effect, but this is acceptable and perhaps wise as a starting point. Once the oracle is live and Peg IRM is operating, we will monitor the peg stability and interest response. We can then decide to increase or decrease this coefficient based on empirical peg behavior.

Conclusion

Hyperstable's shipped Day-1 parameters show both alignment and divergence from Anthias Labs' recommendations. Target Utilization (82.5%) and Adjustment Speed (50% per year) align well with the suggested values, promoting capital efficiency and stability. However, key differences emerge: the Minimum Rate Floor is nearly zero (vs. 3% recommended), the Maximum Rate Cap is only 2% APR (vs. 50%), and the Manual Interest Rate is set higher at 5.2% (vs. 2%), overriding the adaptive model. Additionally, the Peg IRM Update Period is shorter at 30 minutes (vs. 4 hours), risking over-reaction to market noise, and the Peg IRM Interest Coefficient is less aggressive, potentially delaying peg corrections. Overall, while some settings are on target, the cautious and restrictive choices may limit the system's ability to dynamically manage risk and respond to market shifts.

Changes summary

Parameter	Hyperstable Day-1 Value	Suggested Adjustment
Minimum Collateralization Ratio	150 %	No change (monitor; raise to 160 % only if volatility rises)
Debt Threshold (Buffer)	5 %	No change
Liquidation Reward	5 % of debt	Increase to 6 – 7 %
Buffer Reward (Protocol Cut)	11.25 % of collateral	Reduce to 7 – 9 %
Target Utilization	82.5 %	No change
Curve Steepness	4	No change
Adjustment Speed	50 %/yr	No change
Initial Rate at Target	1 % APR	No change
Minimum Rate at Target	0 % APR	Introduce 2 – 3 % floor at target
Maximum Rate at Target	2 % APR	Raise to 5 % APR
Manual IRM Rate	4.20 – 5.2 % APR	Reduce toward 2.5 – 3 % APR
Peg IRM Update Period	30 min	Extend to 1 h
Peg IRM Coefficient	0.25	No change (review as real-time data comes in)

Table 2: Suggested Adjustments to Hyperstable Day-1 HYPE Collateral Parameters

Parameter Interdependencies and Coherent Configurations

The Interest Rate Model (IRM) for HYPE collateral relies on a set of parameters that do not operate in isolation; their values must be coordinated to ensure the system remains stable, responsive, and aligned with Hyperstable's risk management objectives. The two tables below provide recommended configurations for key parameter pairs. These guidelines help calibrate the IRM to balance borrower incentives, lender returns, and protocol safety across varying market conditions.

Manual Rate	Min Rate at Target
2%	2.5–3%
3%	2–2.5%
4%	1.5–2%
5%	1–1.5%
6%	0.5–1%

Table 3: Correlation between Manual IRM Rate and Minimum Rate at Target

Interdependency and Rationale

This table illustrates an inverse relationship: as the Manual Rate increases, the suggested Minimum Rate at Target decreases. This configuration ensures coherence between the fixed and adaptive components of the IRM:

- High Manual Rate, Low Min Rate: A higher Manual Rate (e.g., 6%) provides a substantial baseline cost. Setting a lower Minimum Rate at Target (0.5-1%) allows the adaptive IRM flexibility to drop rates when

utilization is low, avoiding an excessively high combined rate that could deter borrowing.

- Low Manual Rate, High Min Rate: A lower Manual Rate (e.g., 2%) requires a higher Minimum Rate at Target (2.5-3%) to ensure borrowing costs don't fall too low during underutilization, preserving lender incentives and system revenue.

Importance

Currently, Hyperstable relies heavily on the Manual Rate, overriding the adaptive IRM due to a near-zero Minimum Rate at Target. This table offers a roadmap for transitioning to a more balanced system. Properly aligning these parameters prevents borrowing costs from becoming too punitive (discouraging usage) or too lenient (increasing risk), especially as the Peg IRM activates.

Curve Slope (k)	Max Rate at Target
4	7%
5	6%
6	5%

Table 4: Relationship between Curve Steepness and Maximum Rate at Target

Parameter Definitions

- Curve Slope (k): Controls the steepness of the IRM curve, dictating how quickly borrowing rates rise as utilization deviates from the target (e.g., 82.5%). A higher k means more aggressive rate adjustments.

- Maximum Rate at Target: The upper limit of the borrowing rate at the target utilization under stress conditions, acting as a cap within the adaptive IRM.

Interdependency and Rationale

This table shows an inverse relationship: as the Curve Slope increases, the Maximum Rate at Target decreases. This reflects the dynamics of rate responsiveness:

- Gentle Slope, Higher Max Rate: A lower slope (e.g., 4) results in slower rate increases above target utilization, necessitating a higher Maximum Rate at Target (7%) to ensure rates can reach adequate levels during high demand or stress.

- Steep Slope, Lower Max Rate: A higher slope (e.g., 6) accelerates rate increases, so a lower Maximum Rate at Target (5%) suffices, as rates climb quickly beyond the target without needing a high cap at the target point itself.

Importance

The shipped configuration caps the Maximum Rate at Target at 2% APR with a Curve Slope of 4, limiting the IRM's ability to respond to stress. These recommended pairings enhance flexibility: a steeper slope with a modest cap prevents rates from spiking too harshly, while a gentler slope with a higher cap ensures sufficient rate escalation when needed. This balance is critical for managing risk without overly penalizing borrowers.

Why These Interdependencies Matter

Calibrating these parameters coherently is essential for:

- Risk Management: Misaligned settings (e.g., a low Manual Rate with a near-zero Min Rate) could allow excessive borrowing at negligible cost, increasing under collateralization risk. Conversely, a steep Curve Slope with an overly high Max Rate could deter usage during normal conditions.

- User Experience: Predictable and balanced rates encourage participation from both borrowers and lenders, avoiding extremes that could disrupt system adoption.

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- System Resilience: As the Peg IRM activates, these guidelines ensure the IRM adapts smoothly to utilization and peg dynamics, reducing reliance on manual overrides.

Practical Application

These tables are starting points, not rigid rules. The shipped Day-1 settings deviate from these recommendations, reflecting a cautious launch strategy. However, adjustments align more closely with these coherent configurations. Real-world data and market conditions should guide further tuning, especially as utilization approaches the 82.5% target or peg adjustments come online.

By following these interdependency guidelines, Hyperstable can evolve its IRM into a robust, automated system that effectively balances capital efficiency, risk, and user incentives.

Current State of USH

Debt Levels and Borrowing Activity:

- The total debt in USH is ranging around $200k for UBTC and $1.5M for WHYPE.

- Debt caps are $5 million for WHYPE and $2.5 million for UBTC, indicating that borrowing capacity is underutilized.

Collateral Utilization:

- Two primary assets serve as collateral: WHYPE and UBTC.

    - WHYPE: Deposits are at $4.5M, showing significant activity and user trust. However, debt levels (i.e., $1.5M) remain well below the deposited amounts.
    - UBTC: Deposits are lower at $450k, with debt at $220k.

Health Factors: Health factor is a measure of collateralization safety, it ranges around 2 for WHYPE vault and 3 for UBTC vault. This indicates users are more leaned toward depositing WHYPE than UBTC(also indicated by the TVL)

Interest Rates:

- Interest rates are adaptive, varying between 4% and 6%. For example:

    - WHYPE: Current rate is at 5.69% with 5.2% as the manual component.
    - UBTC: Current Rate is at 5.28% with 5.2% as the manual component.

- These rates are manually adjusted with components like a BaseIR (e.g., 5.2%), suggesting a lack of fully dynamic responsiveness to market conditions which reduces the efficiency and lacks behind in attracting more users as the rates not moving as they should be moving according to the situation.

User Engagement: The platform shows 264,094 vePEG locked (90.9% of the total), reflecting governance participation. Revenue stands at $1,626 right now.

Liquidation Risk: No liquidations have occurred, as health factors remain above 1.5 for HYPE. This reflects a robust safety margin in current positions.

Performance Analysis

- Collateral Activity: WHYPE is the more active collateral, with higher deposits and debt compared to UBTC, which shows sporadic or minimal usage in some cases. This imbalance suggests WHYPE is preferred.

- Utilization Rates: Debt levels are significantly below caps (e.g., $1.55M vs. $4.6M for WHYPE), pointing to underutilization of available borrowing capacity.

- Stability and Safety: The absence of liquidations and healthy hf (2.04–3.00) indicate a conservative yet safe system. However, low utilization may limit revenue and growth potential.

Areas for Improvement

To enhance USH's performance and user experience, several adjustments are recommended:

1. Increase Debt Utilization: Current debt levels are well below caps (e.g., $1.55M vs. $5M for WHYPE). Incentives like lower interest rates or promotional rewards could encourage more borrowing, balancing utilization without compromising safety.

2. Optimize Interest Rates:

   - Dynamic Adjustments: Shift from manual to dynamic interest rates leveraging the adaptive Interest Rate Model (IRM). Introduce:
     - A minimum rate floor of 3–4% to ensure borrowing remains attractive.
     - A maximum rate cap of 5–20% to allow flexibility during high demand.
   - Current manual rates (5.2%) should be reduced to 2.5–3% initially to stimulate activity, with dynamic increases based on utilization.

Future Outlook

With strategic adjustments, USH will position themselves for sustainable growth:

- Parameter Tweaks: Adjusting the minimum collateralization ratio, debt thresholds, and liquidation rewards (as recommended by Anthias Labs) will optimize safety and efficiency.

- Peg IRM Implementation: Activating and refining the Peg IRM would stabilize USH at $1, increasing trust and adoption.

- Growth Potential: Higher utilization, balanced vault activity (e.g., more UBTC usage), and increased TVL/revenue through incentives and self adjusting interest rates will drive long-term success.

Conclusion

USH demonstrates a solid foundation with stable collateralization (health factors of 2.04–3.00), no liquidations, and a near-$1 peg ($0.998). However, low debt utilization, manual interest rate adjustments, and minor peg fluctuations highlight areas for improvement. By implementing dynamic rates, tightening the peg, and boosting engagement, USH will enhance its efficiency, stability, and appeal, paving the way for a stronger future in the DeFi ecosystem.

Incentive Structure

Minting and Referral Bonus Analysis

Recommended Settings

- Initial Reward Rate: $0.004 USD worth of PEG per 1 USH minted (0.4% bonus on loan amount, which scales to 4% if the price goes up by 10 times).

- Long-term Floor: $0.002 USD worth of PEG per 1 USH.

- Structure: One-time bonus per minting event, with the rate tapering via an exponential decay curve over time.

- Conversion: USD value converted to PEG tokens using the current market price via a reliable oracle.

Current Settings

- Reward Rate: 0.0125 PEG per USH per week for minting and 0.0025 for referral (recurring).

- USD Value: At initial PEG price ($0.04), 0.0125 PEG = $0.0005 USD/week. Over 52 weeks, this totals $0.026 USD per USH minted. Considering the self referrals this reward scales to 0.0312 USD per USH minting at 0.04 USD/peg.

- Current PEG Price ($0.03): at the current price this reward is 0.0234 USD per USH minted per year(including both minting and the referral bonuses)

- Annual Perspective: Weekly reward of 0.015 PEG over 52 weeks = 0.78 PEG/year, or $0.022/year at $0.0285, equating to a 2.2% APR.

Comparison

The recommended one-time bonus of $0.004 USD aligns with the current recurring reward over a 52-week borrowing period at the initial PEG price ($0.04). The current lower USD value due to the PEG price drop is acceptable. The recurring structure incentivizes sustained borrowing, differing from the one-time recommendation but achieving better results in terms of the user's sustained and long term participation. We do think that keeping the rewards PEG denominated might not be the best approach as they lead to uncertainty on the borrower's side about the final reward value. This could be mitigated by giving rewards in USD denomination.

Changes recommended

Value based bonuses: give the rewards in terms of the USD value and convert the peg token value based on the current peg price.

Conclusion

The current settings deviate slightly with the recommended bonuses. The recurring structure enhances long-term incentives, and the higher referral bonus supports user acquisition. Small changes are needed, and dynamic adjustments along with tiered rewards can help optimize the system further.