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# Hifi v3 Whitepaper

# Hifi v3: Fixed-Rate Stablecoin Protocol

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## Abstract

Hifi v3 is an overcollateralized stablecoin protocol designed to deliver predictable liquidity at scale. In comparison to earlier versions of the protocol, Hifi v3 maximizes protocol revenue for Hifi DAO, dramatically increases capital efficiency, enables longer-duration borrowing, and reduces slippage for borrowers.

## Introduction

Since its inception, Hifi has sought to bring predictable, fixed-rate lending into decentralized finance (DeFi). Early versions of the protocol leveraged AMMs and tokenized debt obligations with maturity dates, similar to zero-coupon bonds. Although this approach established Hifi as a distinct player in the DeFi ecosystem, it introduced several systemic constraints that limited capital efficiency and usability. Specifically, liquidity fragmented if multiple maturity dates were required, leading to thinner markets; loan durations were capped at around four years by the specialized math functions embedded in the custom-built AMM; and all collateral types shared a single consolidated interest rate market, which failed to reflect risk differentials across diverse collateral types, making it difficult to compete with industry-specific lending products.

Hifi v3 marks a turning point. Instead of relying on smaller origination fees for protocol revenue, Hifi v3 completely overhauls the protocol's revenue model to capture all earned interest across all positions from day one! This monumental shift aligns with the protocol's core objective of maximizing revenue for Hifi DAO.

In this paper, we present Hifi v3, an overcollateralized stablecoin protocol focused on delivering predictable fixed-rate liquidity. The new protocol architecture unifies protocol liquidity, isolates interest rates, and maximizes protocol revenue for Hifi DAO. Hifi v3 is based on the same core concepts as previous versions but offers several major new features:

- **Real-time interest accrual.** Adopting a stablecoin-based architecture gives Hifi DAO the ability to capture all the accrued interest across all positions. Interest accrues in real-time and can be claimed at any time; there is no need to wait until loans have matured to collect outstanding accrued interest.
- **Unified liquidity source.** v3 eliminates the need for each maturity date to have a specialized AMM. Instead, v3 manages liquidity within a single Protocol Stability Module (PSM) smart contract. Giving users access to liquidity without fragmentation and minimal price slippage makes v3 more user-friendly.
- **Competitive interest rates.** Each balance sheet now has its own isolated interest rate, making it easier to compete with industry-specific lending products. Moreover, by allowing a permissioned role to set interest rates within governance-approved boundaries, Hifi v3 is able to adapt to real-time market conditions without undermining the decentralization and transparency that underpin Hifi's DeFi ethos.
- **Extended loan durations.** Hifi v3 removes the previous limit of 4 years as the maximum term length for a loan. This allows Hifi v3 to offer longer loan durations, opening up new markets for Hifi to compete in.

# Protocol Architecture

Hifi v3 is anchored by three core components: a set of balance sheet smart contracts, the Hifi Dollar (HFD) stablecoin, and the Protocol Stability Module (PSM). Each component interacts to deliver efficient, fixed-rate borrowing and a robust stablecoin framework that competes with both established DeFi money markets and traditional finance products.

**BALANCE SHEET SMART CONTRACTS**

**THE STABLECOIN (HFD)**

**PROTOCOL STABILITY MECHANISM (PSM)**

# Balance Sheet

The Balance Sheet smart contracts are where all the significant decisions are made. Each balance sheet is dedicated to a single collateral type (e.g., ETH, WBTC, or tokenized real-world assets) and a single loan duration (e.g., one month, one year, or longer). This design addresses the liquidity and duration issues that plagued previous protocol versions:

1. **Duration Specialization.** By tying each balance sheet to a specific duration, Hifi v3 ensures that individual positions have unique maturity dates determined by when the position is created and the balance sheet's defined duration. This eliminates the need for a specialized AMM that fragments capital across multiple maturities, improving liquidity in the market.

2. **Collateral Isolation.** Each balance sheet has its own risk parameters, allowing governance to define appropriate collateralization ratios, liquidation incentives, and interest rate ranges that reflect the collateral's volatility and liquidity profile. This ensures tailored risk management for each collateral type, avoiding the inefficiencies that come from a consolidated market with a single interest rate.

3. **Flexible Rate Setting.** Governance sets an allowable interest rate range for each balance sheet. A permissioned Interest Rate Setter can adjust the rate within these bounds, ensuring that interest rates remain aligned with current market conditions. This approach promotes efficient responsiveness to market dynamics while maintaining transparency and a robust set of checks and balances.

When a user mints HFD from a balance sheet, they assume a debt position that must be settled or refinanced before the maturity date. Upon repayment, the protocol burns the borrower's HFD, and the user reclaims the underlying collateral.


# Hifi Dollar (HFD)

At the heart of Hifi v3 lies the Hifi Dollar (HFD), an ERC-20 token that preserves the protocol's commitment to overcollateralized stability. Unlike algorithmic stablecoins or undercollateralized debt instruments, HFD is minted only when a user posts more than 100% of the stablecoin's value in approved collateral assets.

When a borrower locks collateral into the protocol, the protocol checks the position against governance-set collateralization ratios, liquidation thresholds, and per-balance-sheet supply caps. If these conditions are satisfied, the borrower can mint HFD, effectively turning their deposited assets into a tokenized line of credit. As interest accrues over time, the borrower's outstanding HFD balance reflects a predictable cost of capital. The rate remains fixed for the duration of that position.

# Protocol Stability Module (PSM)

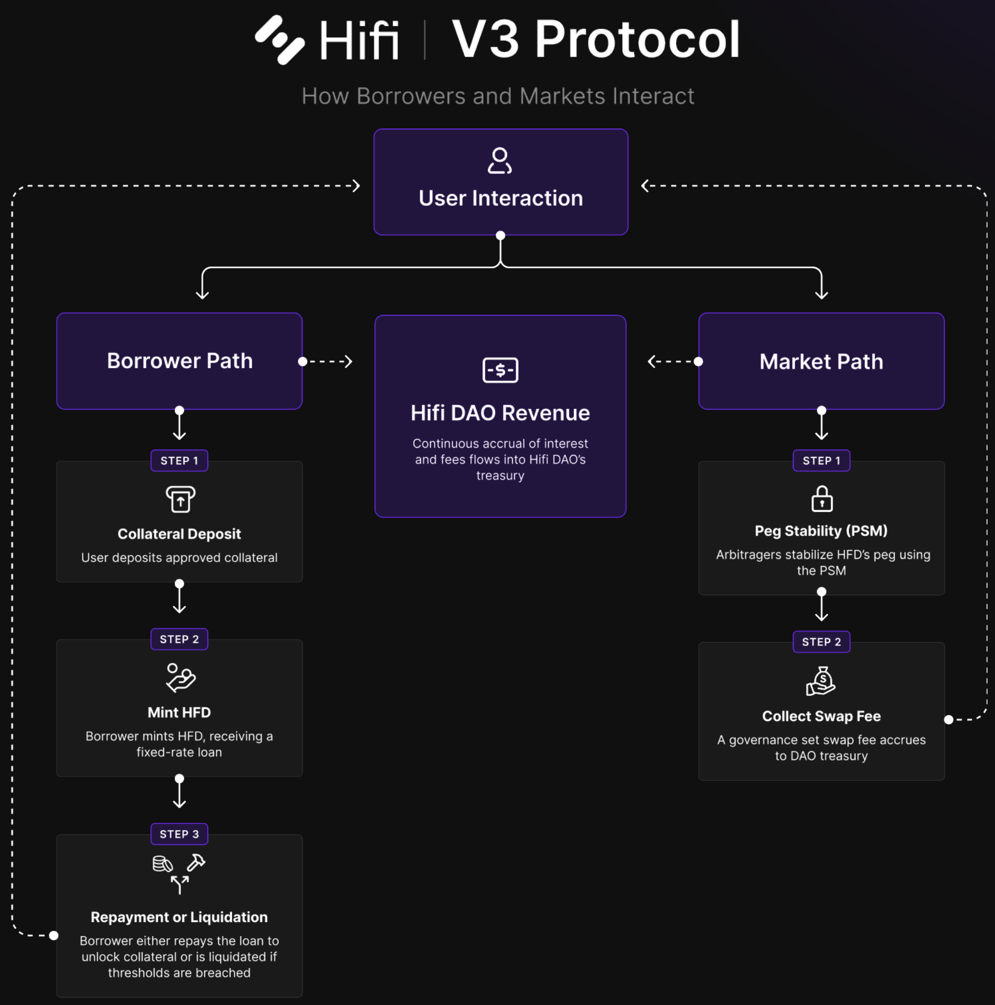
Borrowers and market participants require a stable, liquid path between HFD and other major stablecoins like USDC. The Protocol Stability Module fulfills this role. It performs three primary functions:

1. **Peg Stabilization.** Suppose HFD trades above $1 on external markets. In that case, arbitragers can deposit collateral, mint HFD, sell that HFD on secondary markets for USDC, and swap enough USDC into HFD to repay the debt while keeping the extra USDC as profit—thereby pulling HFD's price back down. Conversely, if HFD drops below $1, traders can purchase discounted HFD, convert it into USDC through the PSM, and earn the spread, which pushes HFD back toward parity.

2. **Unify Liquidity.** The PSM simplifies user interactions by reducing the friction between HFD and the broader DeFi ecosystem. Rather than forcing borrowers to navigate multiple AMMs or liquidity pools, they can rely on the PSM for direct, low-slippage conversions. This unity of liquidity stands in stark contrast to the fragmentation issues observed in earlier protocol versions.

3. **Capture PSM Fee.** Governance has the ability to set a fee on the Protocol Stability Module. This fee allows the DAO to capture additional revenue whenever users swap stablecoins through the PSM. By adjusting this fee based on market conditions, governance can influence HFD's demand and liquidity.

By integrating the PSM, Hifi v3 fortifies HFD's price stability and enhances its utility as a stable medium of exchange within the broader DeFi ecosystem.




# Interest Rates and Protocol Revenue

Under v3, Hifi moves beyond an origination-fee-centric revenue model and captures ongoing interest streams from active loan positions. This mechanism promotes long-term sustainability for the protocol and its governing DAO:

1. **Governance-Approved Rate Range.** Hifi DAO token holders establish upper and lower bounds for each balance sheet's interest rate. This ensures a base level of decentralization and risk control, preventing a single actor from unilaterally setting extreme rates.

2. **Permissioned Interest Rate Setter.** To ensure competitiveness, a trusted role—appointed by governance—adjusts rates within these authorized bounds, responding to changes in market conditions, collateral demand, a protocol utilization target, or macroeconomic shifts. This approach balances efficient market adaptation with decentralized oversight.

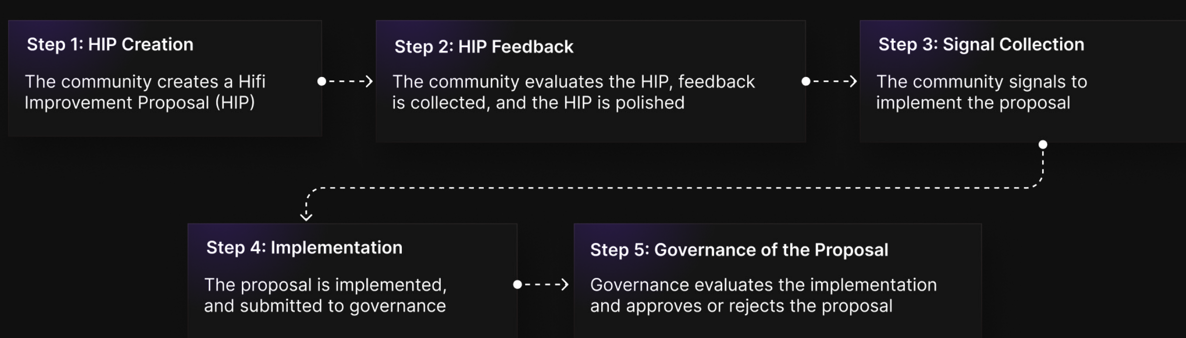
3. **Accrued Interest to the DAO.** Interest accrues continuously across all active loan positions. The DAO decides how much of the protocol's total accrued interest is sent to the DAO treasury and what percentage is shared with liquidity providers. This ongoing revenue stream sustains future protocol development, security audits, and community-driven initiatives. Accrued interest is denominated in the stablecoin, HFD.

By coupling a robust interest rate framework with a direct channel for revenue accrual, Hifi v3 positions itself as a protocol that can adapt over time, be more sustainable, and incentivize open participation.

# Governance

Governance in Hifi v3 seeks to preserve community autonomy while allowing for day-to-day operational flexibility. Protocol changes are enacted through an on-chain governance system, typically involving five key areas of decision-making:

- **Parameterization.** The DAO sets collateralization requirements, liquidation thresholds, and interest rate ranges for each balance sheet.
- **Balance Sheet Approval.** Adding a new balance sheet—for instance, for a different tokenized real-world asset—requires a proposal, a governance vote, and successful on-chain execution.
- **Target Utilization Rate.** The DAOs will coordinate optimizing protocol efficiency and maintaining a healthy balance between supply and demand for HFD. Governance and the appointed rate setter(s) will need to proactively adjust parameters to prevent excess liquidity or scarcity, both of which could impact HFD's peg stability.
- **Treasury Management.** The DAO treasury, which aggregates interest and fee revenue, can allocate funds to development grants, liquidity incentives, strategic partnerships, or any other purpose governance approves.
- **Maintain Peg Stability.** In addition to the PSM, governance can take direct action to support HFD stability. This includes shutting down shorter-duration markets, which forces users to repay loans and increases demand for HFD. Importantly, shutting down a market does not impact existing positions but prevents the creation of new ones or refinancing under the same terms. Users can still refinance their positions into any other available balance sheet. Additionally, governance can raise interest rates, but these changes apply exclusively to newly created positions. These mechanisms allow governance to actively manage HFD's supply and demand actively, ensuring its price stability.



Daily operations, specifically fine-tuning interest rates within approved boundaries, do not require direct DAO votes. Instead, governance appoints an Interest Rate Setter who can respond promptly to market signals. This structure reduces administrative overhead while preserving ultimate authority for the DAO.

# Risk Management

High collateralization standards and risk-isolated balance sheets mitigate systemic threats in Hifi v3:

- **Overcollateralization.** Hifi v3 adopts a robust collateral ratio, typically exceeding 125% of the value of minted HFD. The exact ratio is set by governance and can be fine-tuned as the risk profile of a collateral asset changes.
- **Collateral-Specific Liquidations.** If a position fails to maintain the required collateralization ratio, a liquidation engine liquidates the collateral, repaying the borrower's debt and reinforcing the peg. Liquidation processes can be optimized per collateral type, acknowledging that real-world assets, for example, require more nuanced liquidation flows and off-chain coordination with DAO-approved lending partners.
- **Market Isolation.** By compartmentalizing each collateral into its own balance sheet, the protocol drastically limits risk and is able to properly accommodate collateral-specific considerations.
- **Audits and Ongoing Testing.** All major updates, balance sheet contracts, and core stablecoin mechanics are subject to external audits and thorough internal testing. These measures, including an industry-standard bug bounty program, help minimize risks for all users.

# Implementation

## Evolution from v2

Hifi v2 was an AMM-centric protocol that relied on specialized yield curves for fixed-maturity debt tokens. While innovative, it struggled to meet the capital efficiency and duration flexibility demanded by institutional and long-term borrowers. By removing specialized AMMs and adopting a stablecoin protocol architecture, Hifi v3 paves the way for greater protocol revenue and sustainability, longer loan durations, more robust liquidity, and risk isolation that all come together to foster greater confidence among both retail and institutional stakeholders.

### Hifi v3 Key Improvements

- INCREASED PROTOCOL REVENUE
- INCREASED LOAN DURATIONS
- INCREASED CAPITAL EFFICIENCY

## Migration Strategy

Although v2 remains operational for existing positions, Hifi v3 encourages new borrowers to mint HFD via its improved balance sheet architecture as soon as it becomes available. Governance will maintain a parallel operation phase, allowing v2 positions to run to maturity. Lending partners with existing positions will be responsible for migrating their customers to Hifi v3.

# Use Cases and Adoption

Hifi v3's design caters to a spectrum of borrowing needs. Traditional cryptocurrency holders can leverage on-chain assets like ETH for liquidity without volatile floating rates, while real-world asset owners can unlock multi-year financing for tokenized real estate or other tangible assets. As liquidity aggregates around HFD, the protocol's improved interest rate mechanics and risk isolation strategies make it an appealing option for diverse market participants.

# Conclusion

Hifi v3 embodies a next-generation approach to fixed-rate, fixed-term borrowing within DeFi. By introducing balance sheet smart contracts for isolated collateral risk, providing a collateral-backed stablecoin (HFD), and empowering a permissioned Interest Rate Setter to adapt to market shifts, Hifi v3 overcomes the limitations that constrained earlier protocol versions. Most importantly, Hifi v3 maximizes protocol revenue by capturing all accrued interest, ensuring a more sustainable future for the protocol. This stable, scalable, and revenue-generating system is well-positioned to serve a broad range of users—from individual DeFi enthusiasts to large-scale asset managers.

In moving forward, the Hifi DAO retains the capacity to refine protocol parameters, onboard new collateral types, and distribute the revenue generated from earned interest. As we continue to bridge the world of traditional finance on-chain, Hifi v3 stands as a foundational building block for a more robust and transparent financial ecosystem.