FRINGE

Whitepaper, V1.2

July 2022

Abstract

The Decentralized Finance ecosystem has established a growing variety of financial services for the crypto space, including trading, lending, saving, insurance, options, futures and derivatives. There are established projects within this ecosystem that offer single-point solutions within this variety of services, as well as compound solutions that offer a combination of them. The predominant platforms in this ecosystem offer broad support of these financial services for the well-known, large capitalization cryptocurrencies. However, this support rapidly diminishes for smaller, less-known altcoins. There is a material magnitude of capital locked in these altcoins and yet their holders have limited opportunities to deploy their capital in the DeFi ecosystem.

In addition, there are a number of distinct disparate blockchains upon which these offerings are available. A challenge for investors and asset holders is that by and large these different blockchains represent separate environments where services are not currently freely interoperable across different chains. Some cross-chain interoperability exists, but such facilities are still reaching a state of maturity, with significant opportunity for improvement to provide seamless interoperability. Currently, assets are less mobile across the disparate environments, which increases costs for users to operate across them and limits capital efficiency.

The market to offer a broad set of financial services across multiple blockchains for holders of smaller, less-known altcoins is relatively untapped. Fringe Finance offers owners of these altcoins a compound solution of borrowing/lending and saving facilities with added insurance capabilities and a flexible choice of variable and fixed-interest lending and savings solutions. Fringe Finance also aims to provide cross-chain interoperability for certain services. Our platform also offers composability: third-party projects can employ Fringe Finance's financial offerings into their own composite product offerings. We believe this results in a platform with a unique value proposition and long-term viability that will act as a core platform component of future innovations in the rapidly expanding Decentralized Finance ecosystem.

Contents

0 About this whitepaper and the Fringe Finance ecosystem

This whitepaper examines the design of Fringe Finance and its joint ecosystem. As such, it covers the three platforms currently constituting Fringe Finance:

1. The Primary Lending Platform, released on June 24th, 2022.
2. The USB Stablecoin Platform, currently underway.
3. The Staking Platform, currently underway.

This whitepaper does not aim to constitute a comprehensive overview of the above, but rather a high-level starting point for anyone that wishes to get familiar with Fringe's vision and workings. As some components of Fringe Finance are currently underway, any description of them in present tense constitutes only a figure of speech to avoid redundancies in the text.
For a more elaborate documentation of the smart contracts and inner workings of Fringe Finance, refer to our official documentation.

1 Introduction

The Fringe Finance platform is dedicated to unlocking the capital in speculative cryptocurrency assets by providing loans collateralized by these assets. Holders of these more speculative assets who have conviction to the upside price opportunity of their tokens can now put them to productive work instead of just waiting idly for their price to appreciate.

The cryptocurrency market comprises a large number of cryptocurrencies. Some are well-known with large market capitalizations, high liquidity and with broad support by many DeFi platforms for trading, lending, borrowing and other services. There are other smaller *altcoin* cryptocurrencies that have smaller market capitalizations, lower liquidity and are not well-supported by a broad variety of DeFi platforms.

These smaller altcoins are often new or apply to a niche use case and therefore can be more speculative than more popular, large cap cryptocurrencies. The capital locked in these smaller altcoin assets often could not easily be deployed into the DeFi ecosystem because of the lack of broad support by DeFi platforms.

Fringe Finance solves this problem by accepting a large variety of smaller altcoin assets as collateral for stablecoin loans. Even though these smaller altcoins are often more volatile than the larger, more popular coins, Fringe Finance uses a variety of borrowing parameters and related mechanisms to maintain the stability and financial protection of the platform. These parameters include a platform-wide maximum borrowing capacity for each collateral asset and automated computation of the LVR. To effectively implement these mechanisms, the asset's historic volatility, available liquidity, and other non-subjective metrics are taken into account. See Section 8.3 - Collateral Asset Parameter Modelling for more details on how these parameters are modeled.

Fringe Finance's vision also includes cross-chain collateralization, fixed-interest loans, lending against NFTs, a truly decentralized UI, and embedded DeFi insurance which provide a platform rich in features to service the growing crypto economy. The Fringe Finance platform will sustainably adapt through transitioning governance to the Fringe Finance DAO so that its community of stakeholders can best guide its future direction to best suit the community.

The Fringe Finance Platform offers the following compelling benefits for its various participants:

Participant	Value Proposition
Lender	Lenders can be institutional lenders, high net-worth individuals or stablecoin holders who wish to receive more attractive interest rates as compared to what they can receive in the traditional banking system. They do this by lending out their USD holdings on the Primary Lending Platform in the form of whitelisted USD-pegged stablecoins.
Borrower	Borrowers who have conviction of the upside price opportunity of their assets can now put them to productive work instead of just waiting idly for their price to appreciate by taking out stablecoin loans on the Primary Lending Platform. They can also mint USB stablecoins on the USB Stablecoin Platform and deploy them as they see fit elsewhere in the crypto economy.
Altcoin Project	An altcoin project enjoys the same benefits as a Borrower by deploying their treasury into the platform so that they can take out loans for project expenditure or invest in new initiatives without needing to sell their project tokens.

	This has the additional benefit of removing from market supply the tokens they use as loan collateral, resulting in a positive impact for the price of their project token.
USB Saver	Any participant in the crypto economy who holds the USB stablecoin can deposit their USB in the USB Stablecoin Saving facility to receive interest payments.
Staker	The Fringe Finance Staking Platform aims to offer rewards for staking of various assets to incentivize token holding and staking to benefit the Fringe ecosystem and community. Staking assets will include FRIN tokens, relevant liquidity provider tokens, fTokens (Fringe Finance's interest-bearing tokens received by lenders) and others. Staking rewards will be offered variously in relation to both long-term and short-term staking incentivization schemes. FRIN token holders can opt to stake their FRIN tokens to receive rewards derived from fees charged on the Fringe Finance Platform. FRIN Stakers will also be able to participate in directing the evolution of the platform via voting for DAO proposals.
Liquidator	Liquidators help keep the platform stable by liquidating positions that fall below minimum collateralization levels – and receive the liquidated collateral assets at a discount – which they can sell on the open market to realize a profit.

Table 1: Benefits for participants in the Fringe Finance Platform.

2 Platform Overview

Fringe Finance's market differentiator is to provide holders of low liquidity coins with a means to act as borrowers by accessing collateralized loans of stablecoins and to mint the Fringe Finance stablecoin (USB) to use as they see fit within the broader DeFi economy.

Lenders can also enjoy attractive interest rates by offering to lend out their stablecoin capital on the platform.

Fringe Finance also offers incentives for Liquidators to help stabilize the platform, for USB savers to earn attractive interest rates and for FRIN token ($FRIN) holders to stake their tokens to earn rewards from fees charged on the Fringe Finance platform.

Finally, the Fringe Finance platform provides both ongoing and temporary staking reward opportunities to encourage various actors to interact with the platform and to promote awareness and adoption.

In all, the Fringe Finance platform offers a unique opportunity for low-liquidity coin holders and for all other participants who interact with the platform in alignment with this endeavor. The Fringe Finance Platform offers an immediate-term, sustained model of reciprocal economic incentives for all participants to establish and support this vision.

And with the Fringe Finance platform's future transition to governance by the community via the Fringe Finance DAO, the core platform can evolve and extend over time to add more value to holders of speculative altcoin assets which will lead to more value for $FRIN holders.

The Fringe Finance platform consists of the following facilities:

- **Primary Lending Platform:** A facility where lenders loan out their stablecoins and where borrowers borrow stablecoins against their altcoin collateral.
- **USB Stablecoin Platform**: A facility where borrowers mint and borrow stablecoins against their altcoin collateral and where USB stablecoin holders can stake USB to earn interest.
- **Staking & Rewards Platform:** A facility to offer rewards for staking various assets to incentivize token holding and staking to benefit the Fringe ecosystem and community. Staking assets will include FRIN tokens, relevant liquidity provider tokens, fTokens (Fringe Finance's interest-bearing tokens received by lenders) and others. Staking rewards will be offered variously in relation to both long-term and short-term staking incentivization schemes.

2.1 The Primary Lending Platform

The **Primary Lending platform** is a lending/borrowing facility.

The **Primary Lending platform** allows **Lenders** to deploy their capital to earn interest and allows **Borrowers** to take collateralized loans from the Lenders' pool of funds.

Lenders deposit whitelisted stablecoins to the Primary Lending facility's **Primary Capital Pool**. This mints a proportional amount of fTokens, which are assigned to the Lenders in return for their deposit.

Borrowers deposit collateral into a **Primary Collateral Safe** of their own and receive Primary Index Tokens (PIT) in return to reflect their borrowing capacity arising from their deposited assets. The amount of PIT a user receives is derived by multiplying the value of the deposited asset by its loan-to-value ratio, or LVR. Different assets can have different LVRs.

Collateral types accepted into Primary Collateral Safes are assigned a Loan to Value Ratio (LVR) through our approach to parameter asset modeling. Borrowers may take out loans of the capital from the **Primary Capital Pool** in exchange for their PIT tokens (i.e. loans are collateralized). Loan positions may be adjusted by the borrower by either borrowing more stablecoins, repaying any part of the loan and depositing or withdrawing collateral, so long as the minimum collateralization level is maintained.

Interest rates apply within the Primary Lending Facility as follows:

- Borrowers are **charged interest** on their loans.
- Lenders are **paid interest** collected from Borrowers according to their proportion of the **Primary Capital Pool** and its capital utilization rate.

Liquidations work as follows in the Primary Lending Platform:

A Borrower's loan must always be sufficiently capitalized above a Liquidation Threshold. Loans that fall below the Liquidation Threshold are subject to liquidation by Liquidators who repay the loan and in return receive a greater portion of the position's collateral. Primary Liquidations are more fully described later in this document.

Note that the Primary Lending Platform is intended to be similar to the Compound lending platform, with the following key differences:

1. The Primary Capital Pool is limited to select stablecoins,
2. Primary Collateral Safes accept a larger variety of whitelisted assets.
3. Platform fees will be distributed as rewards to FRIN token stakers.

2.2 The USB Stablecoin Platform

The USB Stablecoin Platform allows Borrowers to deposit collateral and to mint USB stablecoin ($USB) against their deposited collateral. USB is a USD-pegged stablecoin backed by crypto assets. USB stablecoins are burned when the Borrower re-deposits USB against their open position.

The USB Stablecoin facility allows Borrowers to deposit altcoin collateral into a **USB Collateral Safe** of their own and receive a Line of Credit (represented by PIT i.e. the borrowing capacity of the position). Collateral assets accepted by USB Collateral Safes are a set of whitelisted altcoins. Minters may mint USB stablecoins against their line of credit (i.e. USB stablecoins are collateralized.) Upon repayment of $USB, the $USB is burned and the Borrower's line of credit is unlocked according to the amount repaid.

Borrowers are charged a Stability Fee as part of the mechanism to keep the USB stablecoin stable. This Stability Fee is the cost to mint and hold $USB – and therefore effectively acts as an interest rate on borrowing. Stability fees are pooled and paid out to USB stablecoin Savers

who deposit their USB to receive interest. This dynamic between Borrowers' Stability fees and USB Savers' interest is part of the economic mechanism that elegantly stabilizes the price of the USB stablecoin to parity with 1 USD.

Liquidations work as follows in the USB Stablecoin Platform:

A Borrower's position must always be sufficiently capitalized above a Liquidation Threshold. Positions that fall below the Liquidation Threshold may be subject to liquidation by Liquidators who repay the minted USB and in return receive a greater portion of the position's collateral. USB Stablecoin Liquidations are more fully described later in this document.

The USB Stablecoin facility is intended to be similar to the DAI stablecoin platform, with the following key differences:

1. The USB Stablecoin platform mints and burns the USB stablecoin.
2. USB Collateral Safes will accept a larger variety of whitelisted altcoins.
3. Platform fees will be distributed as rewards to FRIN token stakers.

2.3 Staking & Rewards Platform

The Staking Platform offers rewards for staking of various assets to incentivize token holding and staking to benefit the Fringe ecosystem and community. Staking assets will include FRIN tokens, relevant liquidity provider tokens, fTokens (Fringe Finance's interest-bearing tokens received by lenders) and others. Staking rewards will be offered variously in relation to both long-term and short-term staking incentivization schemes.

For FRIN token holders to receive rewards (a share of fees collected by the Fringe Finance Platform), FRIN tokens must first be staked onthe FRIN Staking Platform. Rewards are awarded to the $FRIN stakers according to their proportion of the FRIN Staking Pool. Rewards are more fully described later in this document.

2.4 Fees

A (small) fee is charged for various interactions and events within the Fringe Finance Platform. Fees accumulate in the **Rewards Pool.** A proportion of fees collected are paid to FRIN token stakers as rewards.

2.5 Asset Types Supported

Projects may apply to have their coin whitelisted so that it can be accepted within the Primary Lending Platform and/or the USB Stablecoin Platform. The Fringe Finance Admin will accept or reject the application. The Admin function will initially be centralized and operated by the Fringe Finance team but will transition to the decentralized community (DAO) once the DAO is live.

Different collateral asset types will be assigned different Loan to Value Ratios (LVR) and debt limit based on their 'risk profile.' When assessing a new coin, various criteria (described in Section 8.3 - Collateral Asset Parameter Modelling) will determine its LVR and debt limit. This is described in further detail later in the document.

The debt limit (Maximum Borrowing Capacity) assigned to each collateral asset aims to protect the platform from external price manipulation attacks and to ensure efficient liquidations in the event of adverse market conditions.

2.6 Fringe Finance Platform packages

The Fringe Finance Platform comprises the following packages:

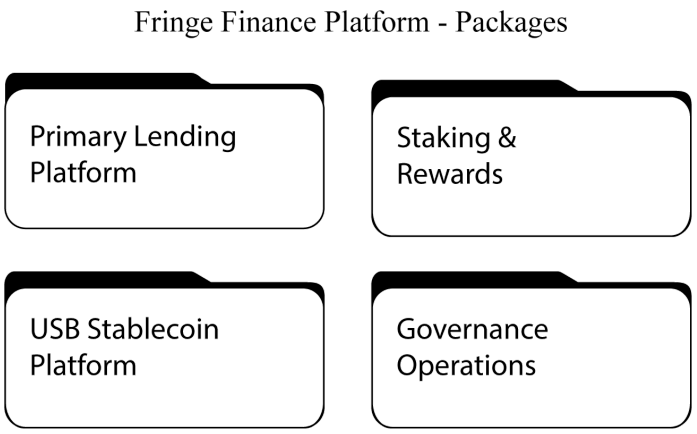

Figure 1: Packages comprising the Fringe Finance Platform.

Package Descriptions

Package	Description
Primary Lending Platform	The Primary Lending Platform is based on the Compound lending platform. The key differences are that only a whitelist of stablecoins are loaned out and that the accepted types of collateral is a range of whitelisted ERC-20 assets. Rewards **Lenders** for depositing (whitelisted) stablecoins made available to be lent to Borrowers. Allows **Borrowers** to take out over-collateralized stablecoin loans against whitelisted 'high-quality' collateral. Contains a facility to allow **Liquidators** to liquidate Borrower loans that fall below minimum collateralization levels. The **System** administers the following: • Interest payments to Lenders • Levies interest charges on Borrowers' loans • Collection of fees and diverts them to the Rewards Pool
USB Stablecoin Platform	The USB Stablecoin Platform employs many aspects of the DAI stablecoin model with the key difference being that accepted collateral assets are a (wide) range of whitelisted ERC-20 assets. It also:

	• Allows **Borrowers** (i.e. Minters) to mint USB stablecoins against a range of whitelisted collateral. • Allows USB Savers to deposit their USB stablecoins - so as to earn interest. • Contains a facility to allow **Liquidators** to liquidate Borrower positions that fall below minimum collateralization levels. The **System** administers the following: • Levies stability fees on Borrower open loan positions. • Pays interest to USB stablecoin savers. • Collection of fees and diverts them to the Rewards Pool.
Staking Rewards	Allows **FRIN token holders** to stake (and unstake) $FRIN - to earn staking rewards. The **System** pays staking rewards to $FRIN staking positions. FRIN Staking rewards are paid from the Rewards Pool. The Rewards Pool accumulates fees collected by the platform.
Governance	Allows a **Project** to apply for listing on the USB Stablecoin platform. i.e. where USB Collateral Safes accept the project's ERC20 coin. The **Admin** actor assesses the application then either accepts or rejects it. Accepting an application will result in the Project's token being listed on the Primary Lending Platform and/or the USB Stablecoin Platform. To note: • An asset's LVR is calculated by analyzing the price history of the collateral asset and gauging its maximum price decreases over any 4-hour timeframe, within which liquidations are reasonably likely to take place. There are also conservative factors in place to make the platform resistant to extreme scenarios. • The Admin actor will be replaced by the DAO community once governance decentralization occurs. • The Primary Lending facility follows a model similar to the Compound lending platform. Given that the USB Stablecoin facility follows the DAI stablecoin model, some additional governance actions will apply as per the Compound and MakerDAO governance operations. These additional governance operations are not described here in this document but can be found in the relevant Compound and MakerDAO documentation.

Table 2: Description Fringe Finance packages.

2.7 Fringe Finance Platform Actors

The actors for each component of the Fringe Finance Platform are as follows:

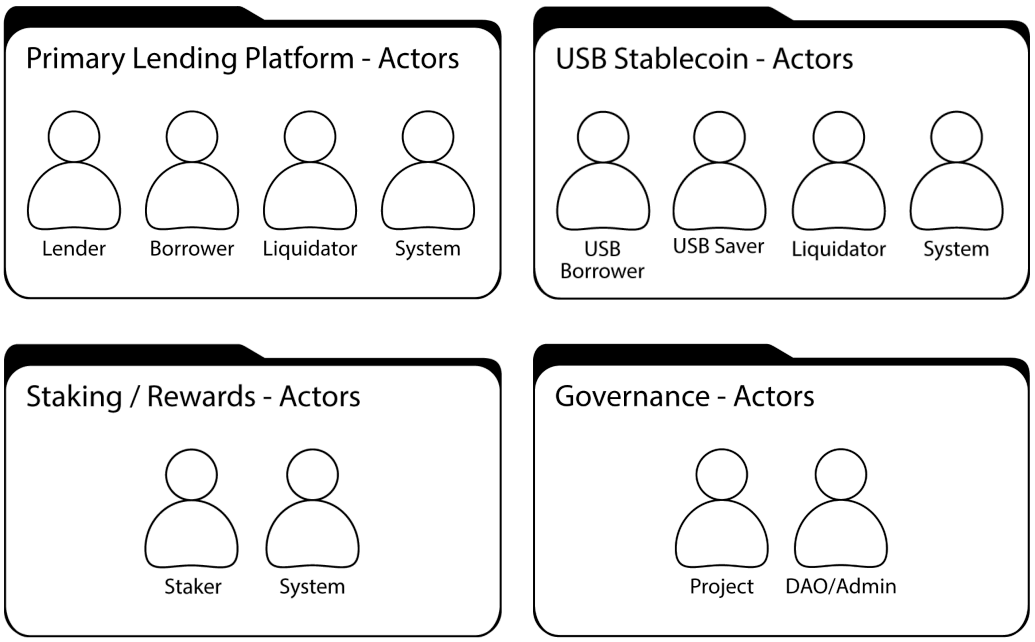

Figure 2: Fringe Finance Platform actors.

Actor Descriptions

Package	Actor	Description
Primary Lending Platform	Lender	Any user who supplies whitelisted stable coins as capital to the **Primary Capital Pool** to be made available for Borrowers to borrow. Receives interest payments for supplied capital, via higher redemption value of their fTokens. Described below.
	Borrower	Any user who supplies collateral to a **Primary Collateral Safe** to take out a stable coin loan from the capital within the Primary Capital Pool.
	Liquidator	Any user who identifies and then liquidates a loan that is below the minimum collateralization level in the Primary Lending Platform. The USB Stablecoin Platform also has a similar liquidator role.
	System	The Fringe Finance Platform, which takes fees for various user interactions with the platform, charges Borrowers interest for open loans, pays interest to Lenders and pays platform rewards.
USB Stablecoin Platform	USB Borrower (Minter)	Any user who supplies collateral to a USB Collateral Safe and borrows (mints) USB stablecoins against their deposited collateral.

	USB Saver	Any $USB holder who deposits their $USB to the USB Savings pool to receive interest.
	Liquidator	Any user who identifies and then liquidates a loan below the minimum collateralization level in the USB Stablecoin facility. The Primary Lending facility also has a similar liquidator role.
	System	The Fringe Finance Platform, which takes fees for users' interactions with the platform, charges BorrowerStability Fees (interest) for open loan positions, pays $USB Savers' interest and charges platform fees.
Staking/Rewards	Staker	Stakers may stake various assets and receive rewards as part of the incentivization for token holding and staking to benefit the Fringe ecosystem and community. Staking assets will include FRIN tokens, relevant liquidity provider tokens, fTokens (Fringe Finance's interest-bearing tokens received by lenders) and others. Staking rewards will be offered variously in relation to both long-term and short-term staking incentivization schemes. FRIN token holders who stake $FRIN in the Fringe Finance Staking Platform will receive rewards of a portion of fees collected by the Fringe Finance Platform and allow them to participate in governance voting.
	System	The Fringe Finance Platform, which issues rewards to stakers according to their proportion of the stake in the various Fringe Finance staking pools.
Governance	Project	ERC-20 Project that makes an application to the Fringe Finance Platform to have their coin listed as a collateral type accepted by the Primary Lending Platform and USB Stablecoin Platform.
	DAO/Admin	Accepts or rejects projects' requests for listing - and assigns parameters for accepted projects (LVR, Maximum Borrowing Capacity, conservative factors).

Table 3: Description of the Fringe Finance Platform actors.

3 Primary Lending Platform

Within the Primary Lending Platform:

Lenders can deposit whitelisted stablecoin assets to the Primary Capital Pool to earn interest from Borrowers who borrow these stablecoins.

Borrowers deposit whitelisted altcoin assets to Primary Collateral Safes which can be used as collateral against which they can borrow stablecoins from the Primary Capital Pool.

The following diagram illustrates the key functions and participants in the Primary Lending Platform:

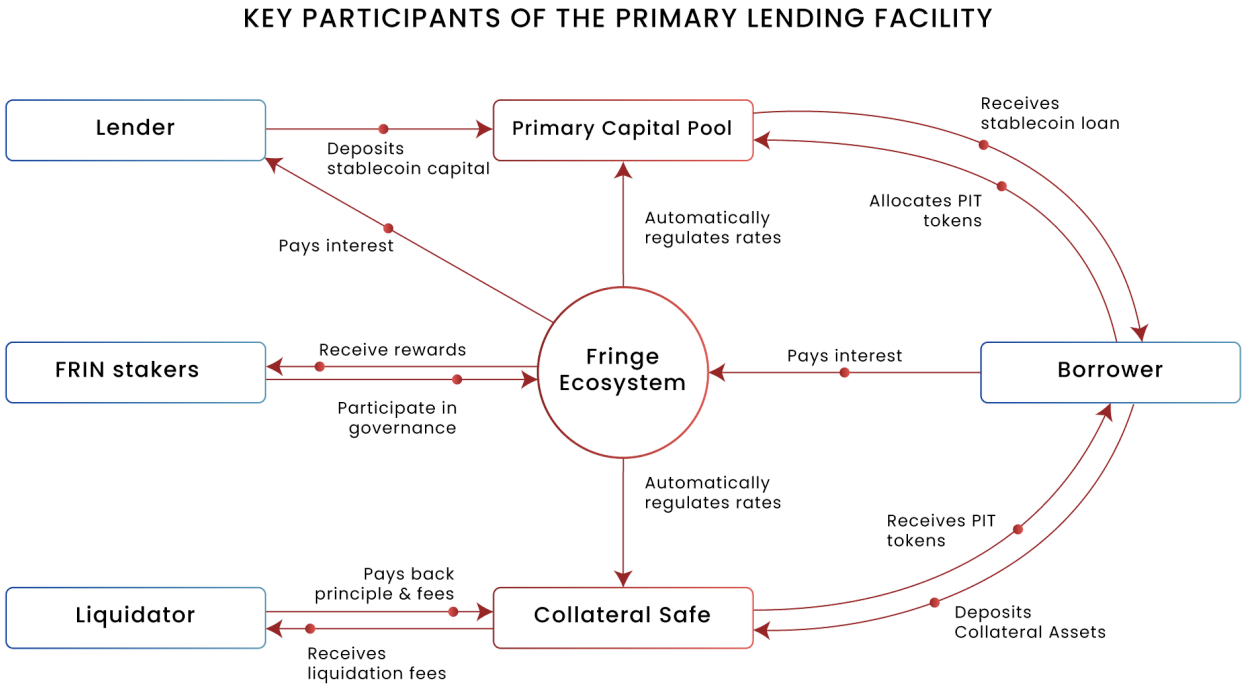

Figure 3: Functioning of the Primary Lending Platform.

Users can interact with the Platform in a number of ways, fulfilling different roles, as shown by the diagram below:

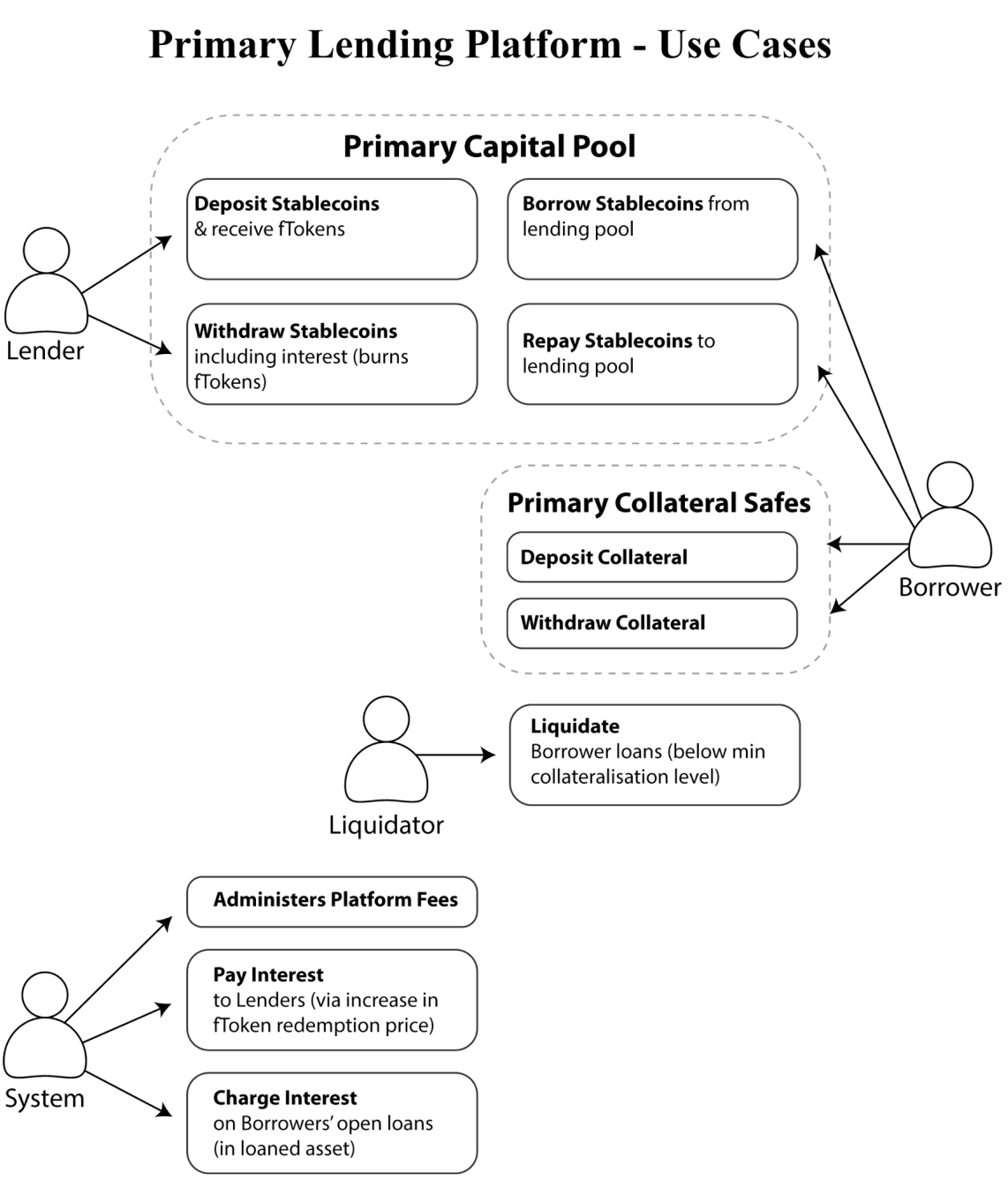

Figure 4: Primary Lending Platform use cases.

3.1 Lenders – Depositing stablecoins

Lenders deposit whitelisted stablecoins to the Primary Capital Pool and receive fTokens in return to reflect their deposit. The Primary Capital Pool is composed of separate markets of each whitelisted stablecoin.

Unlike an exchange or peer-to-peer platform, where a Lender's assets are matched and lent to a Borrower, the Fringe Finance protocol aggregates the supply of Lenders' assets; when a Lender supplies an asset, it becomes a fungible resource. This approach offers significantly more

liquidity than direct lending. Unless every asset in a market is borrowed, Lenders can withdraw their assets at any time, without waiting for a specific loan to mature.

3.2 Lenders – Receiving interest

Assets supplied to a market are represented by an ERC-20 token balance ("fTokens") which reflects the deposited underlying asset. Holding fTokens entitles the owner to an increasing quantity of the underlying collateral asset. As the money market accrues interest, which is a function of borrowing demand, fTokens become convertible into an increasing amount of the underlying asset. In this way, earning interest is as simple as holding an ERC-20 fToken.

Indeed, a holder of fTokens does not need to redeem them on the Fringe Finance platform to regain their deposited stablecoin assets — they can instead sell the fTokens on the open market for whatever asset they wish, as long as an external market exists.

3.3 Lenders – Withdrawing stablecoins

Lenders redeem their fTokens to withdraw stablecoins from the Primary Capital Pool. Their fTokens reflect the interest they have earned by an increase in the redemption rate of fTokens since they received them.

3.4 Borrowers – Depositing altcoin collateral

Altcoin holders can deposit whitelisted altcoins to the Primary Lending Platform into a user-specific and asset-specific Collateral Safe within the Primary Lending Platform. For example, if the user deposits two different projects' tokens, they will establish two different Collateral Safes.

In return for their altcoins, users receive a non-transferable token, PIT, which standardizes their collateral assets. Each PIT is pegged to 1 USD. As such, PIT represents the Borrower's borrowing capacity in USD.

The amount of PIT tokens awarded to the Borrower for the assets they deposit is based on the LVR for the asset deposited. PIT value can be calculated using the following formula:

$$\mathbf{PIT = AssetPrice_c * CountOfTokens_c * LVR_c}$$

Where:

- $AssetPrice_c$ = USD price of the collateral asset
- $CountOfTokens_c$ = Number of collateral asset tokens deposited
- LVR_c = The collateral asset's LVR

The amount of a user's PIT (i.e. lien of credit) will fluctuate with the market price of their collateral assets deposited on the platform. For a full breakdown of how a collateral asset's LVR is determined, go to Section 8.3 - Collateral Asset Parameter Modelling.

3.5 Borrowers – Undertaking stablecoin loans

Borrowers can take out stablecoin loans from the Primary Capital Pool based on their borrowing capacity. i.e. amount of PIT tokens they have available.

Each specific loan is taken out in relation to a particular Collateral Safe. Therefore, a user may have multiple loan positions open at any time, associated one-to-one with multiple Collateral Safes.

If the Borrower has remaining borrowing capacity for a given Collateral Safe (i.e. remaining PIT tokens), the loan amount can be extended by borrowing additional stablecoins or excess collateral can be withdrawn by the Borrower.

3.6 Borrowers – Interest charges on open loan positions

Interest is charged on each of the Borrower's open loan positions. This is calculated per block and is accrued to each loan position.

The platform presents both the loan principal amount and the accrued interest amount for each loan.

Accrual of interest increases the amount the Borrower needs to repay to settle the loan. Accrual of interest also reduces the amount of the Borrower's available PIT tokens. i.e. reduces their remaining borrowing capacity.

3.7 Borrowers – Repaying stablecoin loans

Any repayment of stablecoins to settle a loan position is first applied to the accrued interest amount and then applied to the loan principal amount.

Repaying any part of a loan increases the Collateral Safe's borrowing capacity. i.e. increases the amount of available PIT tokens.

3.8 Interest rate dynamics on the Primary Lending Platform

Borrowers are charged interest on their open positions. Lenders receive interest on the capital they contribute to the Primary Capital Pool.

The Primary Lending Platform automatically adjusts the interest rate charged to Borrowers so that a balance occurs to economically incentivize Borrowers' and Lenders' participation in the platform.

- When there is **high Borrower demand**, the interest rate they are charged will be algorithmically **increased**. This will attract **more Lenders** to the platform – who will receive a share of the greater interest charges collected from Borrowers.
- When there is **low Borrower demand**, the interest rate they are charged will be algorithmically **decreased**. This will attract **more Borrowers** to the platform.

The term Utilization Rate is used to describe demand from Borrowers. A low Utilization Rate will tend to decrease interest rates and a high Utilization Rate will tend to increase interest rates. Each stablecoin market offered by the Primary Lending Platform will have its own interest rate dynamic according to its Utilization Rate.

As a result of this dynamic of automatically balancing interest rates, there are no deterministic fixed interest rates. The market determines interest rates. This allows the Fringe Finance Platform to remain competitive in the crypto economy – since deterministic fixed interest rates would cause the platform to swing into and out of being competitive in relation to other crypto platforms.

Note, however, it is likely that Lenders will enjoy higher interest rates for their stablecoin assets using the Fringe Finance Platform as compared to other platforms. This is because the Fringe Finance platform can be a predominant lender for many speculative collateral assets that do not have other well-established lending markets.

4 USB Stablecoin Platform

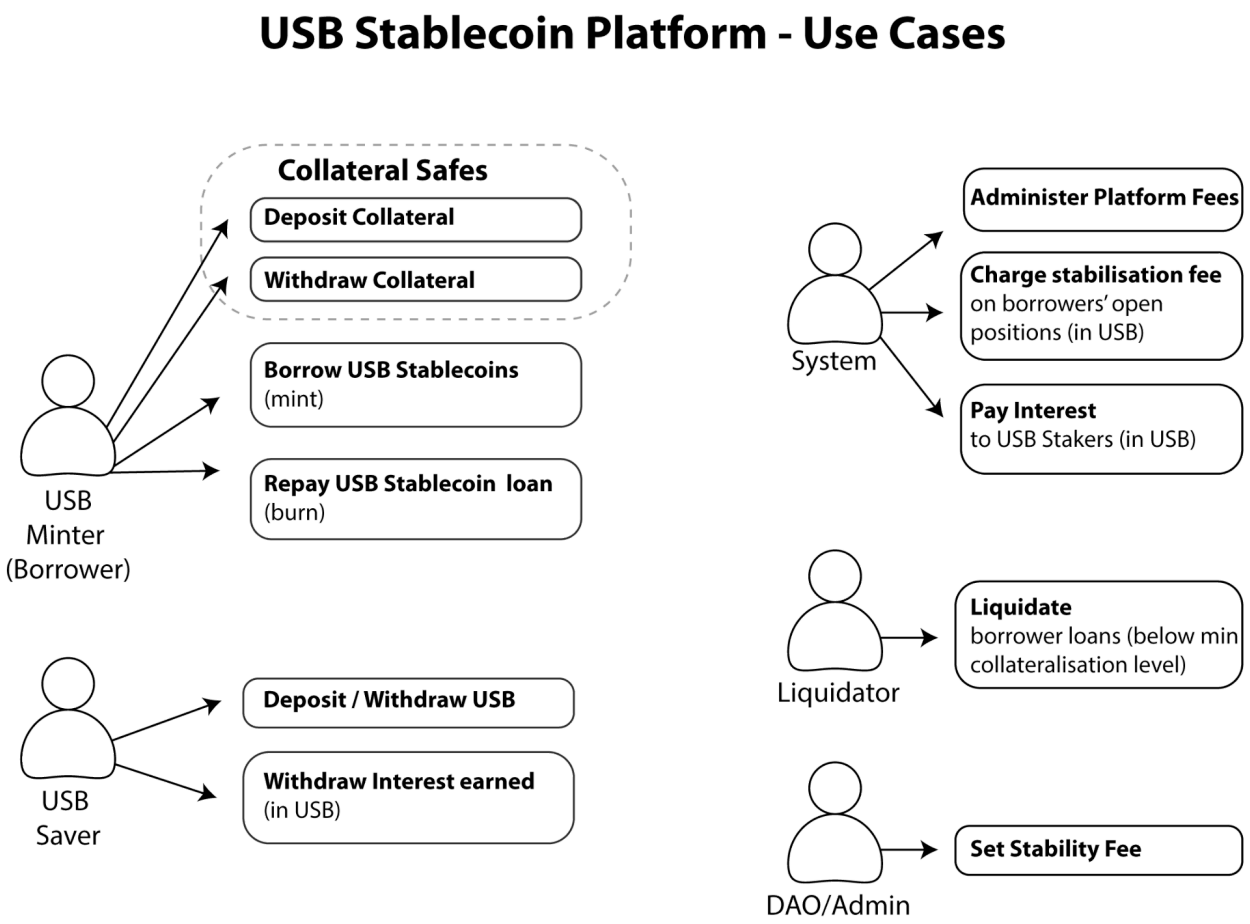

Figure 5: USB Stablecoin Platform use cases.

Though we use the terminology of "Borrowers" in the descriptions below, this is really the participant who mints the USB stablecoin. i.e. the 'minter.'

4.1 Borrowers – Depositing altcoin collateral

Altcoin holders can deposit whitelisted altcoins to the USB Stablecoin Platform (USP) into a user-specific and asset-specific Collateral Safe in the USP. For example, if the user deposits two different projects' tokens, they will establish two different Collateral Safes.

In return for their altcoins, users receive a non-transferable token, PIT, which standardizes their collateral assets. Each PIT is pegged to 1 USD. As such, PIT represents the Borrower's borrowing capacity in USD.

The amount of PIT tokens awarded to the Borrower for the assets they deposit is based on the LVR for the asset deposited. $PIT value can be calculated using the following formula:

PIT = $AssetPrice_c$ * $CountOfTokens_c$ * LVR_c

Where:

- $AssetPrice_c$ = USD price of the collateral asset
- $CountOfTokens_c$ = Number of collateral asset tokens deposited
- LVR_c = The collateral asset's LVR

The amount of a user's PIT (i.e. borrowing capacity) will fluctuate with the market price of the assets they deposited on the platform as collateral.

4.2 Borrowers – Minting $USB

Borrowers can mint USB stablecoins ($USB) based on the amount of PIT tokens they have available. (It can be thought of as a $USB loan that eventually will need to be paid back. The remainder of this description will use the analogy of a $USB loan.)

A specific loan is taken out in relation to a specific Collateral Safe. Therefore, a user may have multiple loan positions open at any one time, associated one-to-one with multiple Collateral Safes.

If the Borrower has remaining borrowing capacity for a given Collateral Safe (i.e. remaining PIT tokens), the loan amount can be extended by borrowing additional USB stablecoins.

4.3 Borrowers – Interest charges on open positions

The USB Stablecoin's prevailing Stability Fee can be thought of as the 'interest rate' charged to open $USB loan positions.

Interest is charged on each of the Borrower's open loan positions. This is calculated per block and is accrued to each loan position. The platform presents both the loan principal amount and the accrued interest amount for each loan.

Accrual of interest effectively increases the amount the Borrower needs to repay to settle the loan. Accrual of interest also reduces the amount of the Borrower's available PIT tokens. i.e. reduces their remaining borrowing capacity.

4.4 Borrowers – Repaying USB positions

Any repayment of USB stablecoins to settle a loan position is first applied to the accrued interest amount and then applied to the loan principal amount.

Repaying any part of a loan increases the Collateral Safe's borrowing capacity. i.e. increases the amount of available PIT tokens.

4.5 USB Savers – Depositing USB tokens

USB token holders may deposit their $USB on the USB Stablecoin Platform Saving facility to earn interest.

4.6 USB Savers – Receiving interest

USB Savers receive interest in the form of USB stablecoins. Interest accrues against their position and is displayed by the platform.

Interest is sourced from stability fees charged against $USB Borrowers. i.e. interest charge to Borrowers against their open $USB loan positions.

Interest paid to $USB Savers is calculated based on the proportion of the $USB savings pool their deposit represents. Interest accrues to the USB Saver's deposit holdings – in the form of USB tokens.

4.7 USB Savers – Withdrawing USB tokens

USB Savers can withdraw their $USB at any point including any accrued interest, back into their connected wallet.

4.8 Interest rate dynamics on the USB Stablecoin Platform

Borrowers are charged interest on their open positions. i.e. Stability Fee charges. USB Savers receive interest on the USB tokens they deposit in the USB Savings Pool.

The USB Stablecoin Platform allows the Platform Admin to periodically adjust the Stability Fee (i.e. interest rate) charged to Borrowers so that a balance occurs to economically incentivize Borrowers' and Lenders' participation in the platform.

- When there is **high Borrower demand**, the interest rate they are charged will be periodically manually **increased**. This will attract **more USB Savers** to the platform – who will receive a share of the greater interest charges collected from Borrowers.
- When there is **low Borrower demand**, the interest rate they are charged will be periodically manually **decreased**. This will attract **more Borrowers** to the platform.

As a result of this dynamic that automatically balances user participation, there are no deterministic fixed interest rates. The market determines the interest rates via the Admin adjustments to the Stability Fee.

This allows the Fringe Finance Platform to remain competitive in the crypto economy – since deterministic fixed interest rates would cause the Platform to swing into and out of being competitive in relation to other crypto platforms. Note, however, it is likely that USB Savers will enjoy higher interest rates for their USB stablecoin assets using the Fringe Finance Platform as compared to using other stablecoins and staking them on other platforms. This is because the Fringe Finance platform will be a predominant lender for many speculative assets that do not have well-established lending markets.

5 Liquidations

A Borrower's loan must always be sufficiently capitalized above a Liquidation Threshold. i.e. Collateral Value * LVR. Loans that fall below the Liquidation Threshold may be subject to liquidation by Liquidators who repay the loan and in return receive a greater portion of the position's collateral.

A liquidation event incurs a Liquidator Fee. The Liquidator Fee varies for each collateral type.

As an example, say a Borrower supplies $1000 worth of collateral which has an LVR of 60% and a Liquidator Fee of 15%.

At that moment, the collateral is able to collateralize up to a $600 loan. Let's say the Borrower takes out a loan of $500 USDC. Their loan position's Health Factor is $600/$500 = 1.2. A Health Factor greater or equal to 1 is above the Liquidation Threshold and is safe from liquidation.

If, because of a downward movement in price of the collateral, the Total Collateral Value falls to $800. The *maximum amount that collateral can guarantee* is now $480. The loan position's Health Factor is $480/$500 = 0.96. The position is subject to liquidation.

The liquidator pays out the loan (500 USDC) and in return receives collateral to the value of the loan plus the Liquidator Fee of 15%. i.e. 115% * $500 = $575.

This leaves the Borrower with $225 in collateral value.

6 Fees

Fees are charged for events within the Fringe Finance Platform. Some of these events are user interactions (such as taking out a loan) and some events do not involve a user interaction (such as interest being charged against a loan.)

Fees are set at 0.25% except for Liquidations which incur a percentage fee depending on the collateral asset's LVR.

The following table lists the **events,** whether a fee is charged, who it is charged to and what the fee is based on.

6.1 Primary Lending Platform events

Event	Fee or No Fee	Charged To	Notes
Deposit/withdraw to/from the Primary Capital Pool	No fee	Lender	No fee charged.
Deposit/withdraw collateral	No Fee	Borrower	No fee charged.
Borrow from the Primary Capital Pool	No fee	Borrower	No fee charged.
Repay loan to the Primary Capital Pool	Fee	Borrower	% of interest accrued amount.

Table 4: Fee events - Primary Lending Platform.

6.2 USB Stablecoin Platform events

Event	Fee or No Fee	Charged To	Notes
Deposit/withdraw collateral to/from the USB Stablecoin platform	No Fee	Borrower	No fee charged.
Take out $USB loan from the USB Stablecoin platform	No fee	Borrower	No fee charged..
Repay $USB stablecoin loan to	Fee	Borrower	% of interest accrued amount.

the USB Stablecoin platform			
Deposit/withdraw $USB to/from USB Savings Pool	No fee	USB Saver	No fee charged.

Table 5: Fee events – USB Stablecoin Platform.

6.3 Liquidation events

Event	Fee or No Fee	Charged To	Notes
Liquidate a position that falls below the minimum collateralization level. (Liquidations can occur on both the Primary Lending Platform and the USB Stablecoin Platform.)	Fee	Borrower	Paid to the liquidator via the discounted collateral the liquidator receives from the borrower's collateral related to the liquidated position. The percentage fee charged is defined on a per-collateral asset basis. Different collateral assets can have different liquidator fee percentages.

Table 6: Fee events - Liquidations.

6.4 Staking/rewards events

Event	Fee or No Fee	Charged To	Notes
Stake/unstake tokens	No Fee	Staker	No fee charged.
Pay staking rewards to staker	No Fee	Staker	No fee charged.

Table 7: Fee events – Staking/Rewards.

6.5 Governance events

Event	Fee or No Fee	Charged To	Notes
Project application	No Fee	Project	--

Project acceptance	Fee	Project	Set by or negotiated with the Fringe Finance DAO (or Platform Admin prior to transition to DAO.)

Table 8: Fee events – Governance actions.

6.6 Denomination of platform fee charges in stablecoins

Rewards are **paid** to FRIN stakers in FRIN tokens. These rewards are derived from fees charged to users of the platform.

Fees **charged** to users of the platform are not paid in FRIN tokens. This would result in a poor user experience, where users would have to first purchase FRIN tokens to use the platform. The Fringe Finance platform avoids this friction.

Fees **charged to** users of the platform are a contained list of stablecoin assets relevant to the event they are partaking in. This avoids the need for the platform to convert the large number of asset types supported by the platform to FRIN tokens (and hence minimizes gas fees during conversion to FRIN tokens, currency risk and slippage risk. These are all real costs that ultimately would fall onto FRIN token holders because they could receive less rewards.)

Therefore, fees charged to users of the platform are as follows:

- Within the Primary Lending Platform, users are charged in the stablecoin borrowed.
- Within the USB Platform, users are charged in $USB.

The platform will exchange the (stablecoin and $USB) fees charged into FRIN tokens on the open market. The Fringe Finance Platform performs this automatically via integration with a third-party DEX platform.

7 Staking & Rewards

The Fringe Finance Staking Platform aims to offer rewards for staking of various assets to incentivize token holding and staking to benefit the Fringe ecosystem and community. Staking assets will include FRIN tokens, relevant liquidity provider tokens, fTokens (Fringe Finance's interest-bearing tokens received by lenders) and others. Staking rewards will be offered variously in relation to both long-term and short-term staking incentivization schemes.

FRIN token holders can opt to stake their FRIN tokens to receive rewards derived from fees charged on the Fringe Finance Platform.

FRIN Stakers will also be able to participate in directing the evolution of the platform via voting for DAO proposals.

The Staking platform use cases are depicted in the following diagram:

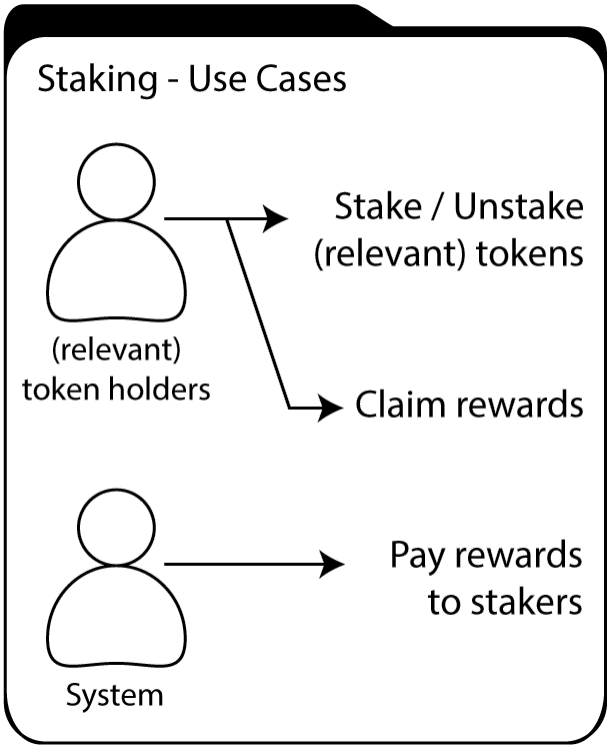

Figure 6: Staking & rewards use cases.

Rewards are paid from the Rewards Pool for each staking asset. The Rewards Pools are funded by the Fringe Treasury from fees collected by the platform, by partners wishing to incentivize awareness of their project, by the Fringe Treasury to incentivize various participation (such as to lenders for staking fTokens, to liquidity providers, etc.)

Rewards are paid as follows:

Behavior Rewarded	Reward Notes
Staked FRIN tokens	Staker receives a proportion of rewards per their proportion of the FRIN Staking Pool. Governance (later the DAO) will decide which portion fees collected are to be paid to $FRIN stakers. To note: No other actors receive rewards of a share of platform fees. Additionally, partner projects may occasionally offer rewards to FRIN stakers to promote awareness of their project to the Fringe community.
Staked fTokens	Lenders will receive rewards from the Fringe Treasury to incentivize their participation as lenders. It is expected this will be a temporary or sporadic rewards regime. To note: As a result of Lenders receiving rewards, Borrowers are indirectly incentivized. This occurs because as Lenders are attracted to the platform to enjoy fStaking rewards, this will result in an overweight of Lender deposits versus Borrower loans. This low utilization rate will cause a reduction in the interest rate via the variable interest rate mechanism, attracting more Borrowers to the platform.
Staked liquidity provider tokens	Stakers will receive rewards from the Fringe Treasury to incentivize their participation as liquidity providers for various token pairs. It is expected this will be a temporary or sporadic rewards regime and will be used as and when needed.

Table 9: List of Rewards

In the future, when new functionalities are added to the Fringe Finance Platform, a decision will be made by Governance (later the DAO) as to whether staking reward incentives may be provided to promote their adoption. Any such rewards program will be designed and implemented along with the new functionalities.

A portion of fees collected by the platform will be paid to FRIN token stakers. In relation to paying FRIN staking rewards, the mechanism of the platform's fee collection, conversion to FRIN tokens and FRIN token Rewards payout is presented in the diagram below:

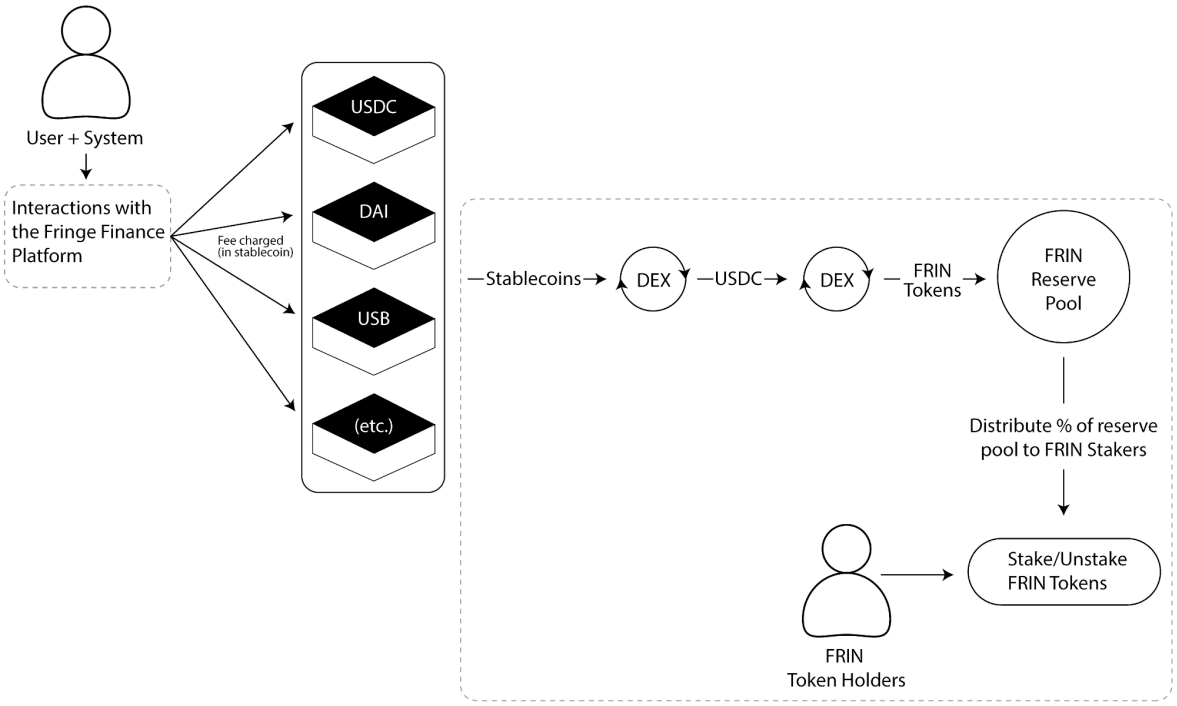

Figure 7: Fee collection, conversion to FRIN and FRIN Rewards payouts mechanism.

8 Governance

The Governance use cases are depicted in the following diagram:

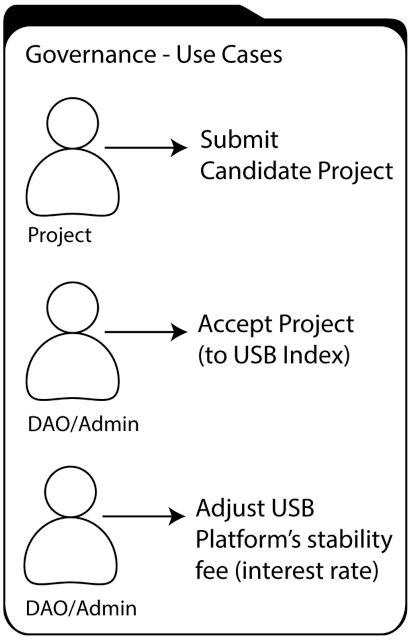

Figure 8: Governance use cases.

8.1 Submitting a candidate project

The Fringe Finance platform will eventually provide a user interface to allow new token submissions to be made.

8.2 Accepting a Project into the Platform

The Fringe Finance Admin will assess new token applications and, if accepted, will assign a LVR and maximum borrowing capacity to the token according to Fringe's parameter asset modeling approach and configure it for inclusion to the Fringe Finance platform. Accepted Project tokens can then be deposited by Borrowers as collateral for loans.

8.3 Collateral Asset Parameter Modeling

When assessing a new coin, the following criteria will determine its initial parameters:

- Loan-to-Value Ratio (LVR)
- Liquidator Reward Percentage (LRP)
- Debt Limits/Maximum Borrowing Capacity (MBC)

The aim of deriving suitable values for these collateral asset parameters is to balance the competing purposes of maximizing both the platform's stability and its long-term user adoption. Deriving suitable parameters employs a systematic and logical approach with a rationale that reflects the characteristics of each collateral asset.

8.3.1 Loan to Value Ratio (LVR)

Each collateral asset has an LVR that defines the ratio of loan value that a user can take out against a given value of its collateral. Loans are overcollateralized; thus, the LVR is always less than 100%. For example, a collateral asset with an LVR of 60% would allow users to take out a loan of up to 60% of their collateral value.

The method to determine LVR is to analyze the price history of the collateral asset and gauge its maximum price falls over the interval of time within which liquidations are reasonably likely to take place. A period of four hours is used to assess an asset's volatility.

The four hours threshold was established due to the competition between liquidators to be the first to liquidate a loan resulting in a strong incentive to perform liquidations quickly. Simultaneously, liquidators may not always be able to immediately perform a liquidation when a loan falls below its minimum collateralization. This could be either due to their capital already being deployed elsewhere or more attractive liquidation opportunities being available.

The below diagram illustrates our approach by displaying discrete four-hour periods. The actual methodology applied in Fringe Finance uses continuous four-hour periods. This simplification makes the diagrammatic depiction more intuitive.

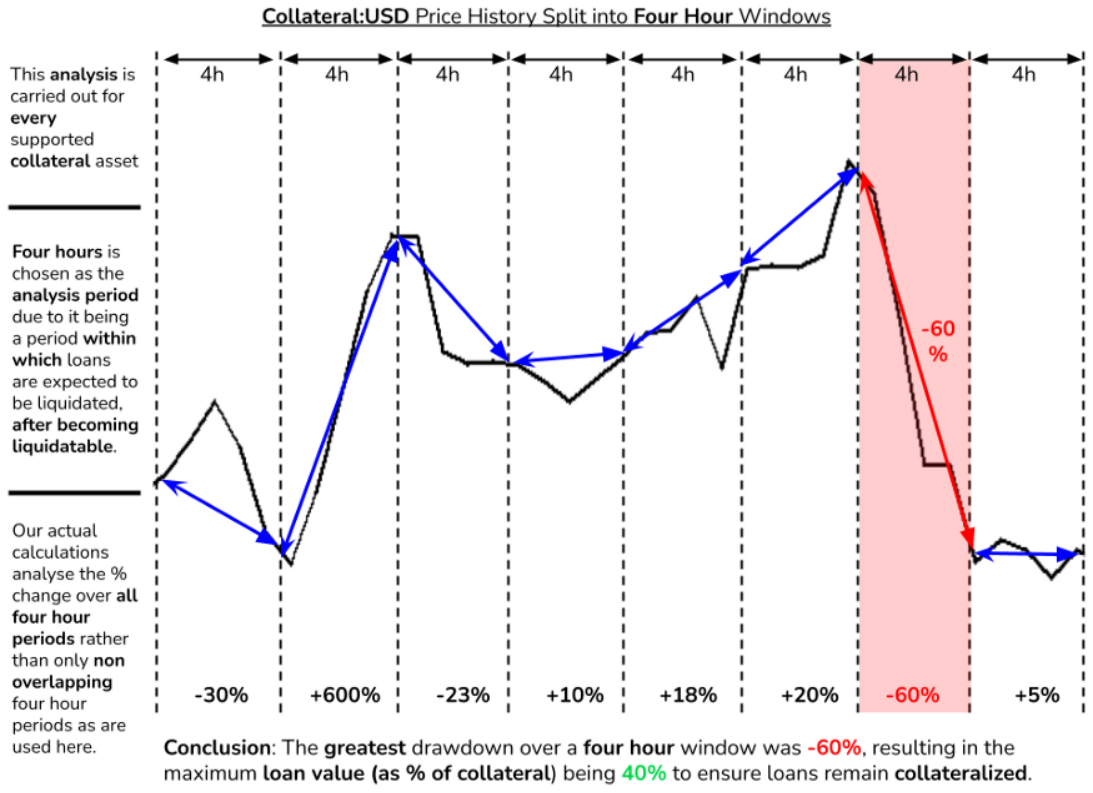

Figure 9: Analysis of an asset's maximum volatility within a four-hour period.

In the example above, the blue lines point to the open and close price points for each time window. The highlighted segment shows where the price fell the most, by 60%. This is then used as the basis for the LVR.

When analyzing historical price data, an asset's initial weeks of trading might be excluded from the dataset due to the highly volatile nature of such low liquidity periods. Such early-stage volatility is generally not reflective of long-term later patterns.

When loans are liquidated, the underlying collateral is subsequently sold by liquidators, potentially causing slippage in its price. To take into account the impact of liquidations on the price of the collateral asset, we multiply the worst expected volatility over a four-hour period by a slippage threshold. The slippage threshold is calculated based on the maximum slippage we expect from all loans secured by a collateral asset being liquidated simultaneously.

As mentioned, a conservative factor is then applied to the maximum price drawdown, including the slippage threshold, to arrive at the final LVR used by the Primary Lending Platform. This conservative factor considers a 5% slippage, therefore reducing the LVR to 0.95 times its original calculation. In the example presented in the diagram, this results in the following calculation:

$$LVR = max\,drawdown * conservative\,factor = 60\% * 0.95 = 57\%$$

8.3.2 Debt Limits (Maximum Borrowing Capacity)

Fringe Finance sets a maximum aggregate debt limit amount for each collateral asset. It applies to the sum of outstanding debt across all borrowers. This parameter ensures that price manipulation attacks are unprofitable and also that liquidators will be willing to perform liquidations by minimizing potential slippage.

To determine an asset's debt limit, we analyze its aggregate liquidity in the markets in which it is traded. This seeks to determine how much liquidity is readily available where there is relatively little slippage.

The following example in the diagram below illustrates how the debt limit protects the Fringe Finance platform. It presents a hypothetical bid order book with a large proportion of its liquidity near the last traded market price, as is typical of order books. As liquidity dries up progressively at prices further away from the recently traded price, any subsequent trades would experience significant slippage, seriously affecting the price at which an asset could be disposed of.

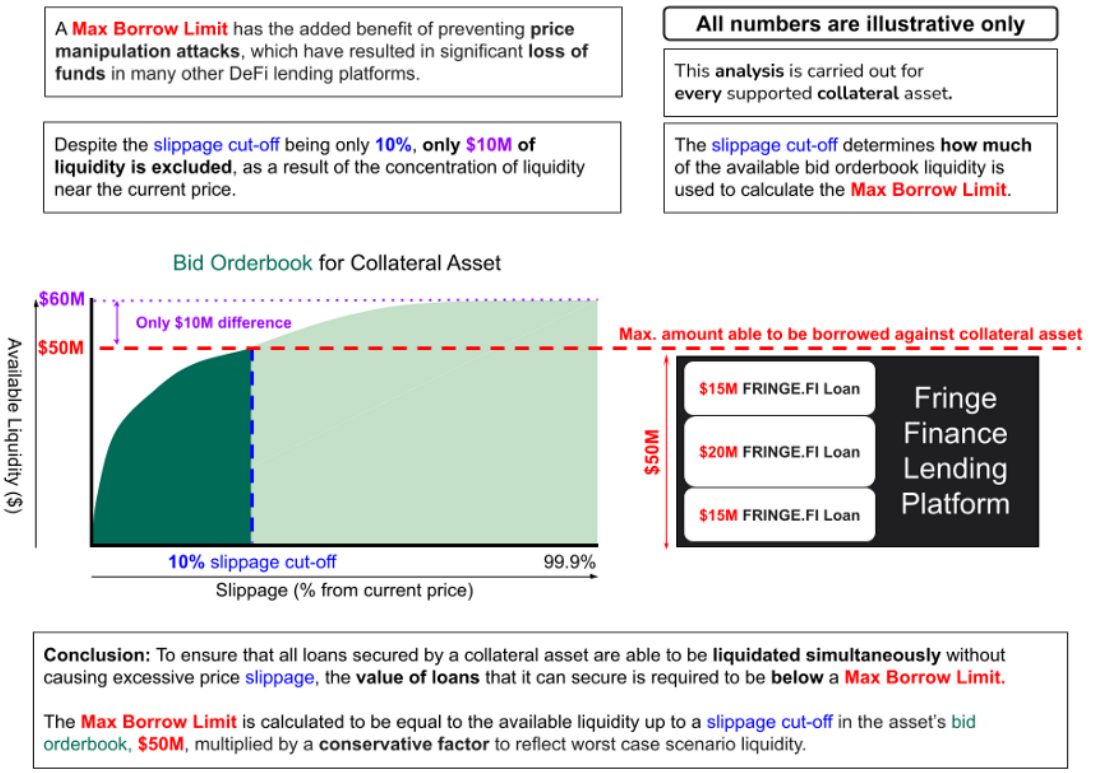

Figure 10: Fringe Finance's Maximum Borrowing Capacity parameter.

$$Maximum\ Borrowing\ Capacity = Readily\ Available\ Liquidity\ up\ to\ the\ Chosen\ Slippage * 50\%$$

The reason to further limit the available liquidity by 50% is that it's not reasonable to assume all orders in the order book will persist in any market movement. 50% is effectively a 'conservative factor' for the sake of prudence.

The slippage threshold used for all collateral assets so far is 5% due to it being a point of diminishing returns. Allowing for higher slippage brings little increased liquidity and therefore is impractical.

The example in the diagram shows that up to $50M of loans on the Fringe Finance platform could be liquidated and disposed of on the available markets within a reasonably acceptable effective slippage. Of course, during usual operations of the platform, only a very small portion of all loans will need to be liquidated at any point in time, resulting in liquidators experiencing much lower slippage than the worst-case scenario.

To maximize the protection of the platform, we configured the parameters for worse-case scenarios to take into account rapid, adverse market conditions that could cause cascading liquidations to occur simultaneously.

8.3.3 Liquidator Reward Percentage (LRP)

The Liquidator Reward Percentage is the percentage of additional collateral assets awarded to the liquidator when they liquidate a loan position. It is intended to offset a liquidator's costs, which include slippage, operational overheads, and other opportunity costs which liquidators must incur.

By far, slippage is the most significant and variable of these additional costs. The Liquidator Reward Percentage is set to be sufficient to cover the slippage costs which would result from all loans secured by a given collateral asset being simultaneously liquidated. As a result, we calculate the Liquidator Reward Percentage so that liquidators always find it profitable to liquidate loans and maintain platform solvency, even in the worst market conditions.

Conveniently, as detailed previously, the maximum slippage that all loans secured by a given collateral asset liquidated simultaneously could cause is limited to 5%, which is achieved due to the debt limit.

As a result, the Liquidator Reward Percentage can be set by simply adding a conservative factor to the slippage threshold of 5%. Initially, the Primary Lending Platform uses a conservative factor of 1.3x, which results in a Liquidator Reward of 6.5%. Given that a high Liquidator Reward Percentage is costly for borrowers if they are liquidated, as it is deducted from their collateral, it is necessary to ensure it is as low as possible without compromising platform stability.

As the debt limit for a given collateral asset is increased, the slippage that liquidating all such loans would result in also increases. Consequently, a higher Liquidator Reward Percentage is required to compensate liquidators for added slippage costs.

8.4 Adjusting a project token's parameters

Governance will monitor the changing characteristics of each collateral asset on an ongoing basis and will continue to assess the platform's performance. The parameters will be adjusted accordingly to achieve the best balance of platform stability, capital efficiency for our users, and to maximize long-term adoption through incentive-compatible mechanics.

Governance will advise the internal market of impending changes to a collateral asset's LVR to allow Borrowers with open positions to adjust them as may be required to avoid liquidations.

8.5 Adjusting the USB Platform's stability fee

Note the governance operations presented in this document are only a subset of the Fringe Finance platform governance operations. The Governance operations presented in this document do not include the actions that are already described in the Compound and DAI governance operations. This is because the Primary Lending Platform borrows heavily from Compound and therefore inherits its governance operations. Likewise, the USB Stablecoin Platform borrows heavily from DAI and therefore inherits DAI's governance operations. See the relevant Compound and DAI documentation for further information regarding their governance operations.

9 Price Feeds

The Fringe Finance platform will employ price feeds from well-known and reliable price feed oracles.

A key component of our criteria in selecting a source of price feeds are reliability and resistance to price manipulation attacks. Price manipulation attacks are frustrated by the need for attackers to maintain their price attack for extended periods of time and/or for them to use significant capital to perform a price manipulation attack, therefore making it too expensive for attackers.

Over time, the Fringe Finance Platform will continue to list additional tokens which can be used as collateral to secure loans. At this point, Chainlink has proven to be a reliable source of price data, given Chainlink has a set of minimum threshold parameters for which they will establish a price feed. These threshold parameters include a collateral asset's minimum liquidity, minimum daily volume, the spread of exchanges on which an asset is traded and a preference for assets that have a large portion of their volume traded on centralized exchanges off-chain (which limits the ability for price manipulation attacks using on-chain flash loans).

These thresholds minimally employed by Chainlink best assure that lending platforms such as the Fringe Finance Platform are protected from price manipulation attacks. As a result, the Fringe Finance Admin will consider Chainlink as the viable source of price feeds.

Given the evolving nature of the DeFi landscape, Fringe Finance will continue to assess price feed reliability and performance to ensure the Fringe platform is suitably protected from price manipulation attacks and failure of oracle price feeds.

10 Cross-Chain Support

Cross-chain support will include the following facilities:

- **Borrowers**: Ability for Borrowers to collateralize loans using collateral on another chain.
- **Borrowers**: Ability for Borrowers to also receive borrowed assets on another chain.
- **Lenders**: Ability for Lenders to deposit assets using assets on another chain.
- **Lenders**: Ability of Lenders to also receive interest payments on another chain.

Fringe Finance will employ proxy contracts to support these cross-chain scenarios. The aim is to enable full composability so that the Fringe Finance Platform can be used flexibly within any number of new DeFi constructs.

Detailed designs and delivery sequence of chain-specific cross-chain bridging will be published once a full review of emerging options and partnerships occur. These will be produced on a case-by-case basis given the specific technical details of each.

The Fringe Finance Platform will employ a combination of Bridging models, Notary models and Hash Time-Lock Contract (HTLC) protocols that are becoming available and are maturing to satisfy the industry's cross-chain requirements. At the time of publishing, a number of candidate technology solutions and HTLC protocols are establishing their viability relating to Fringe Finance's purposes. These include StakerDAO (Algorand, Tezos, Ethereum), Moonbeam (Polkadot<>Ethereum) and Wormhole (Solana<>Ethereum), as well as Bits Labs' cross-chain protocols. Fringe Finance already has partnerships with non-Ethereum blockchains and will be assessing their current and emerging cross-chain bridging facilities.

Fringe Finance is undertaking a systematic analysis of viable technologic solutions to achieve cross-chain collateralization. Our technical team will then prototype a selection of technologies to gauge the trade-offs of each platform before deciding on the set of solutions to be employed to realize this cross-chain collateralization vision.

The key considerations in Fringe Finance's cross-chain collateralization implementation will include security, non-custodianship/trust minimization, user experience, insurability, breadth of token support, breadth of chains supported, cost and restrictions. Fringe Finance may implement varied solutions depending on cross-chain availability and cross-chain type as indicated by the following set of considerations:

	Hash Time Lock	Notary Overcollateralization	Notary Credibility	Bridging Chain (General Solution)	Bridging Chain (Isomorphic cross-chain dedicated solution)
Restrictions	N/A	At least one chain needs to be Turing-complete	N/A	Both chains have to be Turing-complete	Sub-chains to conform to the established framework
Security	High	High	Centralized notaries run the risk of malpractice	High	High
Cross chain Costs	Low	High	Low	Relatively Low	Low
Cross chain Depth	Only cross-chain transactions are possible	Enables assets cross-chain	Enables assets cross-chain	Enables assets cross-chain	Enables cross-chain interoperability of assets and many more forms of cross-chain interoperability

Table 10: Cross-chain model considerations.

Fringe Finance's generalized target conceptual cross-chain architecture will vary according to the considerations tabled above.

In deciding the best cross-chain options to implement, Fringe Finance will take into consideration the community's demand and the best value for FRIN token holders.

11 Fixed Interest

Fringe Finance will in the future provide Lenders and Borrowers with the option of fixed interest rates. This will be valuable for those who aim for predictability and to enable greater adoption of the platform, especially by institutional actors and DAOs.

Interest rates are a critical input in the construction and valuation of any financial asset. Businesses can avoid interest rate risk by engaging in fixed-rate borrowing. Fixed-rate borrowing is the most common form of borrowing in traditional markets.

In order for large traditional businesses to meaningfully adopt borrowing in DeFi, rates need to be more predictable and stable as compared to the currently prevalent variable interest rates found in DeFi. A business that borrows $100M on-chain paying 2% is very unlikely to be comfortable with the rate spiking to 20% a week later, for example, because of an unrelated liquidity mining farm paying extremely high yields. The business will either want to 1) enter into a fixed-rate, fixed-term loan, or 2) have hedging access for their variable rate exposure.

Fixed interest rates will satisfy the market for on-chain DAO-to-DAO business lending which is expected to grow significantly. As businesses mature, debt financing becomes the major source of funding and DAOs will be no different.

There are various methods by which fixed interest rates can be achieved in DeFi. There are trade-offs between each method and Fringe Finance is continuing to explore these options to determine the most suitable approach and partnerships to adopt to best achieve this strategic roadmap item.

The various methods include the following:

- **Zero-Coupon Bonds:** Whereby the borrower creates a generalized bond token (not to be confused with the FRIN token, $FRIN) that settles on a specific date which can be sold on the open market at a known discount (from which is derived the effective interest rate incurred by the borrower.)
- **Yield Stripping:** Where fTokens are split between the principal and interest components and the interest component is traded away.
- **Stable Rates**: Where the borrower is offered a fixed rate that is higher than the variable rate to account for rate volatility.
- **Contracts for Difference (CFDs) and Interest Rate Perpetual Contracts:** Whereby a collateralized leverage position is taken against interest rates.

A short comparison of some of the trade-offs between these different methods is presented below:

Construction	Capital Efficiency	Explicit shorting possible	Liquidation Risk	Synthetic rate exposure	Leveraged rate exposure	Open-term or fixed-term	Fixed-rate Lending	Fixed-rate Borrowing
Zero-coupon bonds	No	Possible depending on collateral	Medium	No	Possible depending on collateral	Fixed-term	Yes	Yes
Yield stripping	On long side	No	Low	No	Long side	Fixed-term	Yes	Possible

Stable rates	No	No	Medium	No	No	Open-term	No	Yes (until rebalance)
IR perpetual contracts	Yes	Yes	High	No	Yes	Open-term	Possible	Possible

Table 11: Trade-offs between different methods to effectively achieve fixed interest rates.

12 Decentralized UI

The Fringe Finance UI will initially be hosted by the Fringe Finance project. However, to ensure greater decentralization and reduce the likelihood of coercion by, for example, a state regulatory actor, Fringe Finance will allow anyone to deploy the client-side user interface. Fringe Finance will deploy the client-side code on a decentralized file server —such as IPFS (InterPlanetary File System)— from which users can download and execute the client code. The client code will interact with the smart contracts already operating in a decentralized manner on the blockchain.

13 Insurance

Fringe Finance intends to allow Lenders to insure their deposits to the Primary Capital Pool via smart contract insurance. Also, we intend to provide a facility for Borrowers on Fringe Finance to take out insurance to protect against collateral asset volatility through its partners –and thus allow a greater loan-to-value ratio to be achieved (or, conversely, allow less likelihood of a loan falling below the minimum collateralization ratio and therefore being subject to liquidation).

The process for this will entail:

- A borrowing process (purchasing insurance policy) that improves the value of the Borrower's collateral.
- Therefore, our platform takes the ERC-721 token that represents the Borrower's insurance position.
- Users can select the amount of coverage they wish through a sliding scale to allow them to set out their risk vs cost preferences.

Possibly this process could entail a binomial options pricing model using historical volatility.
This model of insurance that Fringe Finance intends to pursue is where the insurance facility is able to balance low-cost premiums, security and user experience with respect to purchasing coverage and making claims.

To achieve low-cost premiums, it is necessary that the insurance protocol is able to spread risk across a number of DeFi protocols. Since the insurance is hosted by the Fringe Finance platform and targets only Fringe Finance positions, it is not possible to spread risk across a number of other DeFi protocols. Hence, this will result in inefficient insurance provision and higher-cost premiums for our platform participants.

Therefore, we believe it is in order to partner with external DeFi insurance providers to meet our platform's and users' goals where appropriate.

14 Composability

The Fringe Finance Platform's various services, including lending, borrowing, insurance and fixed-interest, are and will continue to be presented in such a way so as to enable composability. This will allow the Fringe Finance Platform's services to be employed by third-party solutions that specialize in niche markets, whereby our services can be extended to the customers of those third-party solutions.

We see this as a key factor in the long-term success of the Fringe Finance platform—since we anticipate the DeFi ecosystem to continue to grow over time and as more and more third-party solutions provide services to a growing global permissionless marketplace, composability will ensure a growing and long-term use of the Fringe Finance Platform.

Accordingly, Fringe Finance will provide detailed smart contract technical documentation to allow other projects to integrate with its platform in a composable manner.

15 Terms used in this document

Term	Meaning
PIT Token	Primary Index Tokens, which represent a Borrower's borrowing capacity based on the collateral they have deposited multiplied by the asset's LVR. PIT Tokens are issued by both the Primary Lending Platform and the USB Platform in response to Borrowers depositing collateral assets . A Borrower's borrowing capacity (i.e. PIT Tokens) is reduced on Borrowers withdrawing their collateral assets from the Fringe platform. PIT Tokens are non-transferable and are a way to represent the borrower's borrowing capacity. Though PIT tokens are issued both on the Primary Lending Platform and the USB Platform, their borrowing capacity is only recognized on the platform on which the collateral is deposited. i.e. PIT tokens on the Primary Lending Platform are not transferable to the USB Platform.
$USB	Fringe Finance's USD-pegged stablecoin.
Primary Capital Pool	Capital pool into which Lenders deposit capital. There is a Primary Capital Pool for each asset type that Lenders can deposit into the Primary Lending Platform.
Primary Collateral Safe	Collateral location specifically linked to the user into which Borrowers deposit collateral, against which they secure collateralized loans from the Primary Capital Pool. A user may have multiple Collateral Safes - one for each asset type, against which they may borrow stablecoins. To note: There is no notion of a single 'Collateral Pool' for the entire Primary Lending Platform because each loan position is collateralized by assets in a specific Collateral Safe.
USB Collateral Safe	Collateral location specifically linked to the user into which ($USB) Minters deposit collateral, against which they secure the minting of USB stablecoins. A user may have multiple Collateral Safes - one for each asset type, against which they may borrow stablecoins. To note: There is no notion of a single 'Collateral Pool' for the entire USB Stablecoin Platform because each loan position is collateralized by assets in a specific Collateral Safe.
Liquidation Threshold	Threshold of a Lender's loan position that triggers liquidations. This is Collateral Value * LVR
LVR	Loan-to-Value Ratio. This is represented as a percentage between 1% and 100%. For example, a token with an LVR of 60% would allow the user to borrow 600 USDC for each $1000 in collateral value before it was subject to liquidation.

	To note: On the USB Stablecoin Platform, select stablecoins will have an LVR of 100%. The reason for this is to enable arbitrage opportunities to bring the value of $USB back to its $1 peg in the event it diverges from it.
Maximum Borrowing Capacity (aka. Debit Limit)	The maximum amount that can be borrowed against an asset type across the Primary Lending Platform or USB Stablecoin Platform.
Rewards Pool	A pool of funds allocated to be distributed to stakers. There will be different rewards pools to incentivize various participation and different stakers in the Fringe Finance ecosystem.
Reserve Pool	A pool of Reserve funds accumulated from a portion of interest paid by Borrowers. These Reserve funds can be deployed by the Governance process for any variety of use cases to either stabilize the platform, ongoing development, platform operations or benefit FRIN token holders.
fTokens	Lenders deposit whitelisted stablecoins to the Primary Capital Pool and receive fTokens in return to reflect their deposit. The Primary Capital Pool is composed of separate markets of each whitelisted stablecoin. fTokens are the interest-earning representation of users' deposited capital assets.

Table 12: Glossary of terms used in this document.

16 List of tables

17 List of figures