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Abstract

We outline a system in which illiquid debt instruments, like Zero Coupon Bonds (ZCBs), can be borrowed against by virtue of a collateralized asset, $FIAT. We show that the delay in redeemability of illiquid ZCBs for liquid underliers introduces bad debt risk and propose strategies for limiting that risk. The main innovation of this paper is the concept of *Hedge Vaults* which externalize the bad debt risk through an appropriate hedging instrument thereby allowing for higher loan-to-value ratios and capital efficiency. In creating this borrowing solution, $FIAT provides an avenue for fixed yield leveraging or arbitraging and, as a result, reduces the opportunity cost of holding fixed income positions.

1 Introduction

Collateralized borrowing in DeFi to date has been predicated on the existence of liquid secondary markets for supported assets. This has precluded less liquid derivatives, in particular fixed-income assets like Zero-Coupon Bonds, from gaining access to such leverage, thus limiting their attractiveness to market participants. This differs from the legacy financial system where fixed-income is one of the largest asset classes and ZCBs are considered high-quality collateral. We are introducing the FIAT protocol in response to this stark contrast. FIAT will allow users to mint a stable-value token against fixed income assets originated on various DeFi platforms in order to facilitate use cases like yield releveraging and arbitrage. By providing users with a collateralized credit facility, FIAT reduces the opportunity cost of underwriting DeFi debt positions and aggregates secondary liquidity for such assets.

This document highlights the mechanisms by which the protocol is able to safely accept, confiscate, and liquidate collateral assets without taking on material bad debt risk.

2 Zero-Coupon Bonds

A Zero-Coupon Bond (ZCB) is a fixed-income primitive used throughout fixed-rate lending protocols in DeFi. Specifically, ZCBs allow the buyer to lend, or the seller (or minter) to borrow, a fixed amount of underlier tokens over a fixed time period and at a fixed interest rate. This is achieved by selling the token at a discount to its face value prior to maturity. Thus, we can define this class of tokens more formally,

Definition 1 *A ZCB is a token that can be redeemed at a maturity T for a specific amount F, the face value, of underlier tokens.*

These features render ZCBs non-fungible such that, on a technical level, different implementations exist including ERC-721 and ERC-1155, as well as ERC-20 based architectures. Because of this, ZCBs are limited in terms of interoperability and secondary liquidity, resulting in lower efficiency compared to other tokens. These properties have prevented ZCBs from being accepted as collateral on established lending markets where liquidation mechanisms generally rely on the existence of efficient markets.

On the other hand, the feature of redeemability for a fixed amount of underlier tokens assigns these tokens a deterministic fundamental (face) value F. Fixed-rate DeFi protocols guarantee this redeemability in a trustless manner and so anyone holding the ZCB is guaranteed the face value at maturity. Because of the delayed redeemability, however, the holder has to wait until the token matures, leading to ZCBs generally trading at a discount. This discount reflects the price of the delayed redeemability or, in other words, the market's willingness to wait on the conversion to the underlier tokens. General pricing theory thus implies that a ZCB's market price will converge to its face value at maturity as that is when conversion is possible. This can be easily seen from the general ZCB pricing formula,

$$f(t) = \frac{F}{(1+r)^{T-t}} \tag{1}$$

where $f(t)$ is the fair price at time t expressed in underlier tokens, r the applicable discount rate, and F and T are the ZCB's face value and maturity, respectively. Figure 1 shows this effect for different discount rates ranging from 0 (dark blue line color) to 10% (dark red line color). As expected, the fair price converges to the ZCB's face value when the remaining time-to-maturity approaches 0. We can also see that a higher discount rate renders the fair price more sensitive to this effect and so the rate of convergence is higher.

These characteristics are well known and have already been applied by other protocols successfully. For instance, Yield Protocol's Yield Space [3] is an AMM using an invariant that accounts for convergence of the ZCB price towards its face value and has been adopted by a number of ZCB protocols. Similarly, FIAT Protocol proposes some novel concepts that allow for maximal capital efficiency when borrowing against ZCB collateral.

3 $FIAT Token

$FIAT is an ERC20 token that can be minted against deposited ZCB collateral. The FIAT system is designed such that the total $FIAT debt outstanding is fully backed by deposited collateral value akin to a full-reserve currency system. Furthermore, the system maintains an internal 1 USD $FIAT price target but, in contrast to pegged stablecoin systems, allows the market price to fluctuate around this target. Therefore, the FIAT system implements a number of mechanisms which calibrate the supply and demand for $FIAT in order for

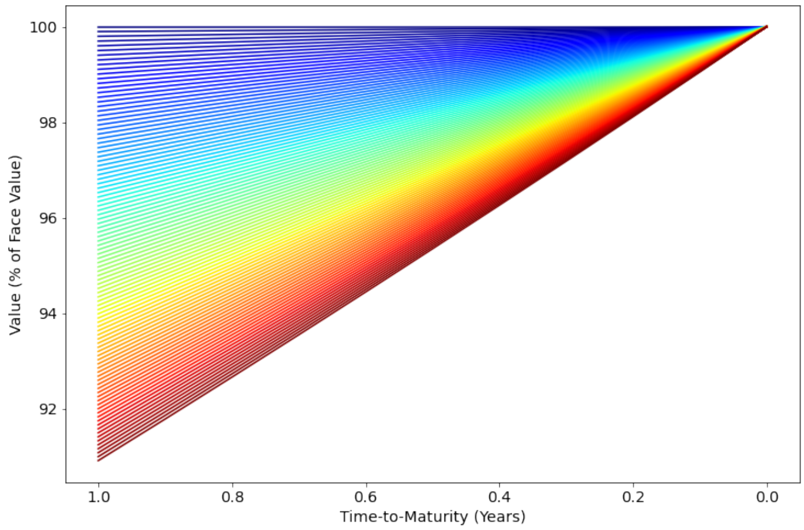

Figure 1: Fair price for a ZCB depending on its remaining time-to-maturity (x-axis) and for different discount rates (different colors).

these targets to be maintained.

4 Borrowing $FIAT

As discussed already, $FIAT can be borrowed against ZCBs which are used as collateral to ensure that the $FIAT in circulation is fully backed. Therefore, the FIAT system maintains a set of records (c_i^k, d_i, l^k, b^k), called *debt positions* or simply *positions*, where c_i^k are the collateral units deposited, d_i is the $FIAT borrowed, l^k represents the loan-to-value limit, and b^k is a borrowing fee. We use subscript i to identify a position and superscript k for the ZCB deposited as collateral.

Definition 2 (Debt Position) *A debt position is a borrowing facility consisting of deposited collateral, borrowed $FIAT, a loan-to-value limit which defines the maximum debt capacity of that position and a borrowing fee.*

Note that only one ZCB can be deposited to a position and different positions have to be created in order to borrow against different ZCBs. As a result, we will generally omit indexes i and k and only use where needed for clarity. Anyone can create a new position by depositing a ZCB to the system. The owner of a position can then borrow (mint) $FIAT up to the position's loan-to-value limit. Borrowing fee b^k is applied on the total minted (nominal) debt d and accrues additional debt directly to that position.
The FIAT system ensures appropriate (over-) collateralization of positions at any time through the following inequality:

$$\frac{d}{pfc} < l \tag{2}$$

with the ZCB's fair price represented by f and the market price of the underlier token p. In case of a violation of inequality 2, the position is confiscated by the system and liquidated.

5 Liquidations

The goal of a liquidation is to recover the confiscated position's debt d and thereby assure that no *bad debt*, debt that is not backed by collateral value, accrues. Therefore, the position's collateral tokens c are converted to $FIAT through the liquidation mechanism.

Definition 3 (Liquidation) *Liquidation refers to the process of converting a confiscated position's collateral tokens to $FIAT in order to pay back the position's outstanding debt d.*

Any liquidation mechanism should be designed such that it prevents from *bad debt* to accrue. Therefore, liquidation mechanisms generally rely on a number of assumptions. The most common, and indeed most critical, is the expectation that external market participants will buy confiscated collateral at a discount to market prices in order to make a profit. Moreover, this further assumes that the price impact of selling the purchased collateral for the debt-denominating token does not result in negative profit. In the context of the FIAT system where the collateral consists of ZCBs, these assumptions are particularly challenging. This is because, as we have discussed previously, ZCB markets are inherently fragmented across protocols, underliers, and maturities, constraining secondary liquidity. While we have seen an influx of liquidity on ZCB markets in recent months and expect this dynamic to continue as markets mature, a scalable approach has to account for the nascent nature of these markets. Therefore, we build on two assumptions;

Assumption 1 (Guaranteed ZCB Redeemability) *ZCBs offer guaranteed redeemability for underlier tokens at maturity. Smart contract risk associated with the protocol originating ZCBs is neglibible or can be covered by hedging instruments.*

Assumption 2 (Liquid Underliers) *Liquid markets exist for ZCBs underlier tokens. Slippage related to exchanging the underlier tokens for other (liquid) tokens can be neglected.*

These two assumptions combined suggest that while ZCBs may not be easily liquidated, they can be converted to underlier tokens with probability 1.0 at maturity for which liquid markets exist. Therefore, the $FIAT system allows for a liquidation to span over the respective ZCB's remaining time-to-maturity $T - t$. During a liquidation, the system applies the ZCB's face value instead of its fair price. This change in accounting principles is motivated by the fact that the ownership of confiscated positions is transferred from the original holder to the system itself with the mandate to recover the outstanding debt. Thus, temporary fair price discounts are irrelevant insofar as the criteria for a successful liquidation is the full recovery of outstanding debt and not the amount of time required therefore. On the other hand, the price at which underlier tokens can be converted to $FIAT strongly impacts the ability of the system to execute a liquidation successfully. Because this price is

subject to uncertainty this introduces a liquidation risk that we will formalize in the next section.
Note that it is expected that ZCBs for which a liquid market exists will be liquidated promptly while the system may hold on to other ZCBs, possibly up to the ZCB's maturity. The further time progresses to maturity, the more attractive the illiquid ZCB becomes as the associated redemption delay converges to 0. Beyond maturity, the ZCB has the same properties as its underlier tokens.

6 Liquidation Risk

For any collateralized lending protocol, liquidation risk refers to the possibility that the system may incur *bad debt*, or unbacked debt, during the liquidation process. The main reason for this is that the collateral value may drop precipitously during the liquidation process such that it cannot be sold at a sufficiently large average price in order for the process to recover the debt outstanding. Because we allow the liquidation of a ZCB to span over its full remaining time-to-maturity, the main risk to consider is that the underlier price falls below a threshold where the system is unable to recover the position's debt outstanding. This threshold is defined as the position's unit debt $q = \frac{d}{Fc}$, or the debt per underlier units deposited. As a result, *bad debt* accrues whenever the underlier price falls below the position's unit debt.

Definition 4 (Bad Debt Event) *Consider a position (c, d, l, b) with market price $p(t)$ of the ZCB's underlier. The event where the underlier price falls below the position's unit debt, i.e. $p(t) < q$ is called a bad debt event.*

Further, let τ denote the time of the first occurrence of a *bad debt event* for a position. This time is also called the underlier price's *first passage time* [6] and is defined as;

$$\tau := inf\{t > 0; p(t) < q\}. \tag{3}$$

Therefore we can formalize liquidation risk as *the probability that a confiscated position incurs bad debt*. More formally, we define;

Definition 5 (Liquidation Risk) *Liquidation risk is the probability of the first-passage-time being smaller than the ZCB's time-to-maturity or $P(\tau \leq T - t)$.*

Note that this definition is particularly useful for volatile underlier tokens. A generalization of this concept for stablecoin underliers is straightforward however. Therefore, consider that the risk of a bad debt event is defined by the possibility of a de-pegging event for the respective underlier. This risk can be expressed as the discrete variable x indicating the number of de-pegging events within the remaining time-to-maturity. The probability $P(x > 0) = 1 - P(x = 0)$ can then be determined according to an appropriate assumption on the distribution of x (e.g. Poisson) or according to some other heuristic.

The definition of liquidation risk developed in this section allows us to quantify the uncertainty around the safety of a liquidation. As a result, we are able to develop an appropriate strategy to control for liquidation risk.

7 Risk Control

Definition 5 allows us to quantify liquidity risk and develop an algorithmic risk control strategy. Our main control variable is a position's loan-to-value limit which defines how much $FIAT the position can borrow against the deposited collateral. We want to find a limit l that reduces the probability for a *bad debt event* to an acceptable residual risk π such that $P(\tau \leq T-t) \leq \pi$. Therefore, we need to evaluate the distribution of the first-passage-time. A common assumption is that price $p(t)$ follows a Geometric Brownian Motion (GBM) [1, 7].

Assumption 3 (Price Dynamics) *The ZCB underlier's price $p(t)$ follows a Geometric Brownian Motion (GBM), i.e. $p(t) \sim GBM(\sigma)$.*

As a result, we can write the probability $P(\tau \leq T-t)$ as

$$P(\tau \leq T-t) = 2 * N\left(\frac{ln(q/p(t))}{\sigma\sqrt{T-t}}\right) \tag{4}$$

where σ is the price process's volatility and $N()$ is the cumulative standard Gaussian distribution function [6]. In order to limit the probability $P(\tau \leq T-t)$ to π we can thus establish the following inequality:

$$\begin{aligned} P(\tau \leq T-t) &\leq \pi \\ 2 * N\left(\frac{ln(q/p(t))}{\sigma\sqrt{T-t}}\right) &\leq \pi \\ ln(q/p(t)) &\leq \sigma\sqrt{T-t}N^{-1}\left(\frac{\pi}{2}\right) \\ p(s) &\geq q_i e^{-\sigma\sqrt{T-t}N^{-1}\left(\frac{\pi}{2}\right)}. \end{aligned}$$

Furthermore, comparing this to inequality 2 we find that the loan-to-value limit for a given residual risk π is determined by the following expression:

$$l = \kappa e^{\sigma\sqrt{T-t}N^{-1}\left(\frac{\pi}{2}\right)}. \tag{5}$$

with pricing differential $\kappa = \frac{F}{f}$ and quantile function of the Gaussian distribution. The term κ is a correction for the change of accounting principle for confiscated collateral. Its value is generally larger but converges to 1 at the ZCB's maturity according to Equation 1. For simplicity, we will neglect this term and assume $\kappa = 1$ instead. The effect of this is that limit l is underestimated or, in other words, the residual risk π overestimated. For

short-dated ZCBs this effect is insignificant, whereas for ZCBs with a long remaining time-to-maturity this results in a more conservative risk control strategy.
As a result, the applicable loan-to-value limit is a function of the underlier's price process volatility and residual risk π. Specifically, for a volatility of $\sigma = 0$ the limit is $l = 1$ and the limit decreases (increases) with increasing volatility (residual risk). This is confirmed in Figure 2 where the limit is shown as a function of the residual risk (x-axis) and for different price volatility ranging from 0% (in dark blue) to 100% (in dark red). As expected, for a lower residual risk level, a smaller limit has to be chosen, indicating that the risk decreases for lower permitted loan-to-value ratios. Furthermore, while for an underlier price process with zero volatility, i.e. a deterministic price and thus only a hypothetical example, a limit of 1.0 can be assigned as the limit decreases with larger volatility.

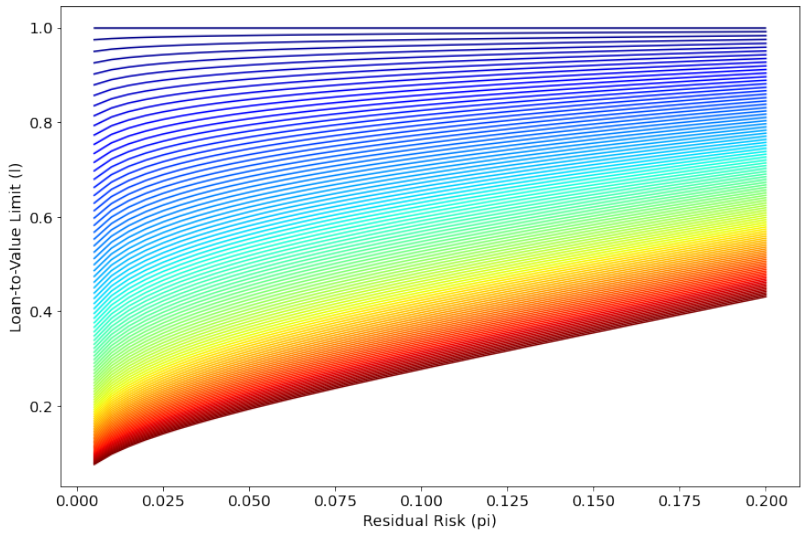

Figure 2: Loan-to-value limit l as a function of residual risk π and for different underlier price volatility σ (different colors) assuming GBM price dynamics.

Similarly, Figure 3 shows the applicable loan-to-value limit for an underlier price process with 50% volatility and different time-to-maturities of the respective position's ZCB. The limit is 1.0 for a matured ZCB (dark blue line) but decreases significantly when the remaining time-to-maturity increases to 1 year (e.g., the dark red line).
Note that the residual risk π implies that *bad debt events* are still possible but the occurrence of these events is now controlled. DeFi protocols generally account for the residual risk with some pooled protocol reserves or the auctioning of protocol tokens that can be used towards covering accrued bad debt.

8 Risk Hedging

As shown in Figures 2 and 3, high residual risk in underlying price dynamics can result in significant loan-to-value discounts and thus limit capital efficiency. An alternative approach is to externalize the liquidation risk through some hedging strategy. Risk hedging

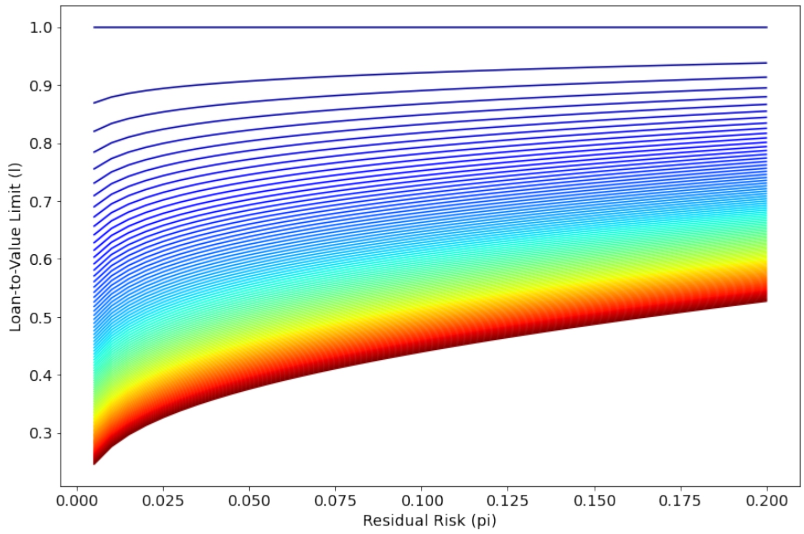

Figure 3: Loan-to-value limit l is as a function of residual risk π and for different time-to-maturity $T - t$ (different colors) assuming GBM price dynamics.

has a long tradition in finance and DeFi has witnessed a significant increase in the availability of hedging primitives such as futures, options, or parametric event coverage (e.g., stablecoin de-pegging). This offers an entirely new approach to mitigating the liquidation risk and safeguarding the backing of $FIAT. Therefore, let us first expand on the hedging primitives that allow us to externalize liquidation risk. We consider any instrument h that swaps one underlier unit for a fixed number of $FIAT before a certain expiration time Θ a hedge instrument.

Definition 6 (Hedge Instrument) *A hedge instrument is a mapping $h : (\mathbb{R}^+, \mathbb{R}^+) \longmapsto \mathbb{R}^+$ that converts a number of underlier units to a fixed (non-random) number of $FIAT within a certain expiration time.*

The linear hedge instrument is the simplest example of such a mapping and can be written as the deterministic function;

$$h(u, t) = \lambda u, \quad \text{if} \quad t \leq \Theta \tag{6}$$

with number of underlier units swapped u, time of executing the hedge instrument t and execution price λ. Note that function h is only defined for $t \leq \Theta$ such that an attempt to execute the hedge instrument after its expiration fails.

Example 1 *Consider a hedge instrument h with expiration $\Theta = 30$ days and execution price $\lambda = 0.8$. If executed on day 20 (10 days before expiration Θ) the instrument swaps 1 underlier unit for 0.8 $FIAT. But if executed on day 40 (10 days after expiration Θ) the swap fails and the underliers are not converted to $FIAT.*

With h we have introduced a very generic concept of a hedge instrument. In the next paragraphs we will discuss a number of practical examples of such instruments.

Risk Underwriting

The underwriting of risk is the most general form of a hedge instrument. This includes a facility that writes protection for some specific (i.e., objectively verifiable) risks and a counterparty who seeks protection for that same risk. If triggered, the protection executes a fixed transaction between the underwriting facility and its counterpart. As a result, risk underwriting allows for some custom, collateral type-specific, hedge instruments organized e.g. as a DAO-to-DAO collaboration.

Stablecoin De-peg Coverage

Various DeFi protocols offer insurance coverage for the event of a stablecoin de-pegging from its target. Generally, this coverage is issued for a specific stablecoin underlier and includes a detailed definition of the de-pegging event such as the deviation from the stablecoin's target price which qualifies for a de-peg.

Futures/Options

Futures and Options are another form of risk underwriting where the protection seller generally protects the buyer from some adverse market dynamics that may result in loss. In the context of liquidation risk, these instruments are specifically suited for hedging the unit price dynamics of volatile ZCB underliers.

Repurchase Agreement

A repurchase agreement can be thought of as a combined sale of a token and a Future contract on the same token. The seller thereby sells the token but at the same time agrees to buy it back at the Future's execution price and expiration date (if executed).

9 Hedge Vaults

The concept of a hedge instrument h allows us to introduce a new DeFi primitive - the *Hedge Vault*. A vault can be considered a borrowing facility that allows for the creation and management of debt positions. In general, vaults use a risk control strategy in order to limit liquidation risk to some residual risk π. Expanding on this, a hedge vault combines the vault concept with a hedge instrument h and, thus, allows for the creation and management of hedged positions (c, d, b, h). Thereby, instrument h is defined for a specific collateral type k and it's execution price and expiration may differ from position to position and is thus identified by; $h_i^k(c^k, t) = \lambda_i c^k, \quad \text{if} \quad t < \Theta_i$. For simplicity, however, we will again omit the position and collateral type indexing for the hedge instrument.

Definition 7 (Hedged Position) *A hedged position is an isolated borrowing facility consisting of deposited collateral, borrowed $FIAT and a hedge instrument which defines the maximum debt capacity of that position.*

Similar to regular positions a new hedged position can be created by anyone by entering a hedge instrument and depositing collateral ZCB to the system. The owner of a hedged position can then borrow $FIAT up to the position's unit debt limit λ as long as the hedge instrument is not expired,

$$\frac{d}{Fc} < \begin{cases} \lambda & \text{if} \quad t < \Theta \\ 0 & \text{else} \end{cases} \tag{7}$$

It can be shown that the hedged position's liquidation risk can be eliminated entirely if the unit debt limit is exactly the hedge instrument's execution price. Therefore, consider that a position's liquidation risk is entirely eliminated if the probability of a *bad debt event* within the deposited ZCB's remaining time-to-maturity is zero or, respectively, $P(\tau < T - t) = 0$. Thus, we have to show that the ZCB's hedged underlier price $\frac{h(u,t)}{u}$ remains strictly larger than the position's unit debt q_i with probability 1 for all times $t < T$. Because the hedge h is a deterministic function we can write $\frac{h(u,t)}{u} = \lambda$ for $t < \Theta$ and thus,

$$\begin{aligned} P(\tau < T - t) = 0 &\iff inf\{\lambda; t < T\} > \frac{d}{Fc} \\ &\underset{T \leq \Theta}{\iff} \lambda > \frac{d}{Fc} \end{aligned}$$

where $inf\{\lambda; t < T\} = \lambda$ is guaranteed if the ZCB's maturity does not exceed the hedge instrument's expiration. This concludes the proof that the liquidation risk is eliminated as long as inequality 7 is maintained by the system.
A number of important implications can be drawn from inequality 7. Firstly, hedge vaults completely eliminate liquidation risk. Compared to the risk control strategy applied to regular vaults this *safe liquidation* mechanism has various advantages. Most importantly, no pooled protocol reserves or auctioning of protocol tokens is required in order to cover losses incurred by *bad debt events*. Secondly, the underlier price, the only source of randomness in regular positions, is no criteria in determining the health of a hedged position. This greatly improves predictability for borrowers and thereby simplifies the management of hedged positions compared to regular debt positions. Lastly, liquidations of hedged positions are triggered as we approach the expiration of a position's hedge instrument. The reason for this is that a hedge instrument's conversion function, see Equation 6, is only defined for times $t < \Theta_i$ and thus an attempted swap of collateral to $FIAT through the instrument fails after its expiration. Because the expiration is a constant this essentially makes position monitoring a trivial task adding to the convenience of borrowing through hedge vaults as discussed above.

10 Interest Rate Oracle

The discount rate r is a key input to the fair price function exposed in Equation 1. So far we have assumed availability of this data for the various collateral types k accepted by the

FIAT system. In reality, however, we cannot rely on this assumption for various reasons. The main reason is the fragmented nature of DeFi fixed-rate ZCB markets characterized by different technical implementations and limited liquidity. On an efficient market one could assume that rates are comparable across protocols as differences would be identified and exploited in due time by arbitrageurs. However, for the reasons discussed already, the large cost associated with this still prevents arbitrageurs from exploiting these inefficiencies. As a consequence, a reliable data service is needed that provides robust interest rate data for each collateral type k. Note that existing data providers, e.g. Chainlink, do not yet provide such a service and the trading volume on ZCB markets versus the requirements of these providers does not suggest availability anytime soon. Furthermore, the intricacies of ZCB markets and implied interest rates warrants a custom approach to data collection, aggregation, and delivery.
The main challenge in developing a robust interest rate data service for DeFi ZCBs is the limited liquidity on these markets. Furthermore, for certain ZCBs no secondary market exists at all which could inform about the rates applicable. This makes these markets and consequently the implied interest rates particularly vulnerable to manipulation, thus introducing potential attack vectors to the FIAT system. In fact, various incidents in the past have pointed out the susceptibility of collateralized lending protocols, amongst other DeFi applications, to oracle price manipulation [5]. As a response, we propose two measures for mitigating that risk and preserving data reliability: data aggregation (1) and delayed data delivery (2). The first measure is a standard technique in on-chain oracle design. Usually this technique implements some statistical aggregation measure across multiple data points of the same data source at sequential times or across multiple data points of different data sources at the same time. Both approaches aim at increasing the cost of data manipulation (i.e., of a potential attack) and are particularly useful for ZCB markets with some minimal liquidity. However, an additional aggregation layer is needed for ZCBs where no market exists or where a market's liquidity is insignificant. We therefore suggest a data service that provides three types of interest rates according to their level of aggregation:

- Level 1 (*Term Interest Rate*): This service provides implied interest rates observed on a specific ZCB market and are aggregated over time. These rates reflect robust interest rates for a specific ZCB.

- Level 2 (*Curve Interest Rate*): This service provides implied interest rates observed for a specific curve and are aggregated over all available *term interest rates* for the ZCB's underlier on the respective protocol. Thus, these rates provide a robust approximation of the rate for ZCBs originated on a specific protocol.

- Level 3 (*Market Interest Rate*): This service provides implied interest rates observed for a specific market and are aggregated over all available *curve interest rates* for the ZCB's underlier token. Thus, these rates provide a robust approximation of the rate for ZCBs with a specific underlier.

The second mitigation measure, delayed data delivery, aims at adding an additional backstop mechanism for the service operator to interrupt delivery of manipulated rates. A similar approach has already been implemented and proven useful in other DeFi protocols [2, 4]. Therefore, the rate delivery process is split into two phases where in the first phase a new data point is proposed but only in the second phase is it delivered to downstream consumer contracts. A delay between the first and the second phase allows the service operator to validate proposed prices and interrupt delivery if needed.
The proposed interest rate data service combined with the fair price principle equips the FIAT system to onboard a wide range of ZCB collateral and thereby scale accordingly. Furthermore, it is expected that with maturing fixed-rate markets the interest rate data service itself will prove useful for other projects.

11 Discussion

In this paper we have outlined a system in which illiquid debt instruments, like Zero Coupon Bonds, can be borrowed against by virtue of a collateralized asset, FIAT, without forgoing capital efficiency or taking on excessive bad debt risk. It achieves this by approximating discount rates per collateral type, discounting the face value of collateral accordingly, and then allowing for the hedging of underlier price volatility. Furthermore, the system's internal targeting of 1 USD per unit of FIAT creates a reflexive mechanism by which market demand signals can influence circulating supply. What results is a protocol capable of aggregating liquidity around a singular low-volatility asset despite its relatively illiquid backing.
In creating this borrowing solution, FIAT reduces the opportunity cost of holding fixed income positions. In the case of stable underliers, the protocol provides an avenue for high loan-to-value ratio borrowing that can then facilitate further leveraging or arbitraging of fixed yields, reducing the capital required to speculate as such. In the case of volatile underliers, FIAT can potentially be minted at higher loan-to-value ratios than those afforded by incumbents to liquid positions in the underlying, as maturities allow for the neutralization of residual risk via hedge vaults. A liquid, low-volatility secondary market for FIAT thus expands the wider market's willingness to use DeFi debt, akin to how Fannie Mae and Sally Mae reduce the risks associated with mortgage or student loan underwriting for American banks.
The implications of a successful FIAT implementation are two-fold. The first is that the concentration of collateral itself will have emergent use cases: collateral swaps, interest rate oracles, and yield optimization all become possible with the information produced by such aggregation. The second is that the protocols that have fought to date for the secondary liquidity of their assets will now be able to compete for the duration of that liquidity as well. The ability to lock up depositor tokens from liquidity pools or lending markets will be viewed as critical in achieving a Lindy effect for any asset, especially through periods of market volatility. FIAT makes this latter prospect more palatable and increases

the chances of any such asset coming to serve as a common debt denomination (i.e., the endgame for any medium of exchange). As such, FIAT stands to serve as a positive-sum addition to the existing DeFi landscape, both creating demand for an underserved asset class and improving the total addressable market of existing asset issuers.

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