EVOL: An Undercollateralized Volatility Trading Protocol

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Abstract

EVOL is a decenteralized, undercollateralized protocol for trading ETH volatility futures & perpetual swaps using Uniswap V3 pools as the trading mechanism. With the continued growth of the DeFi derivates marketplace, there is a growing need for a way to trade volatility directly. By calculating an underlying volatility index and amassing funding payments based on that index, we have a contract that is continuously pegged to the underlying volatility level and allows for direct exposure to volatility fluctuations.

1 Introduction

As DeFi markets continue to evolve, it becomes more important that the ecosystem has all of the necessary trading and hedging building blocks of a mature derivatives market. Volumes of both on and off chain options on crypto underliers continue to grow massively, with volume going from TODO to TODO over the last year, as more sophisticated players enter the space and retail traders continue to seek more complex products. One of the key building blocks that is missing currently is a product to directly trade volatility exposure, both in a perpetual form and in an expiring form to match the popularity of traditional options. With EVOL, we have built a protocol to offer just that, with a funding & settlement mechanism to keep the products pegged to the underlying index values. Traders will be able to buy or sell the product, allowing for long or short exposure to implied volatility levels, opening up a new realm of trading possibility and yield generation strategies.

2 EVOL Index

The underlying EVOL index will be calculated in a manner similar to the VIX index in traditional equity markets. The first key formula below comes from the VIX whitepaper and can be applied to other option markets, where an implied volatility level is found by taking a weighted average of non-zero value option prices across strikes for a given expiry date:

$$\sigma^2 = \frac{2}{T}\Sigma\frac{\Delta K_i}{K_i^2}e^{RT}Q(K_i) - \frac{1}{T}[\frac{F}{K_0} - 1]^2 \tag{1}$$

Next, we calculate the value of (1) for for two dates, T_1 less than 30 days to expiry, and T_2 more than 30 days to expiry, then take a weighted average across these two values to find a 30 day implied volatility level:

$$VIX = 100 * \sqrt{\{T_1\sigma_1^2[\frac{N_{T_2} - N_{30}}{N_{T_2} - N_{T_1}}] + T_2\sigma_2^2[\frac{N_{30} - N_{T_1}}{N_{T_2} - N_{T_1}}]\} * \frac{N_{365}}{N_{30}}} \tag{2}$$

For v0 of the protocol, this value is being sourced from the Volmex Graph API, however we plan to eventually have two calculation sources: For the expiring futures contracts, it will be calculated in the "traditional" manner using option prices pulled from Deribit markets. For the perpetual contract, it is actually made simpler by the fact that we can pull a perpetual implied volatility level from other "option-like" perpetual contracts, such as Opyn's Squeeth, where the daily funding rate f is $\frac{\sigma^2}{365}$. Therefore, $\sigma = \sqrt{365 * f}$.

3 EVOL Tradeable Products

3.1 Perpetual Swap

The perpetual EVOL swap will trade similarly to other perpetual products that exist today. There will be no expiry dates, but funding will be paid between buyers and sellers on a regular (daily, weekly, or monthly) basis out of a trader's collateral position. The funding that will be paid will be the difference between the contract's mark and the underlying EVOL index. This funding mechanism will allow and force the perpetual swap to stay pegged to the underlying index on a regular basis, as opposed to competitor products that only stay pegged via global settlement threats.

3.2 Futures Contracts

Futures contracts will behave similarly to futures contracts in traditional markets with expiry dates and settlements. Expiry dates and times will be lined up with Deribit option expiry timing to allow traders to align their Vega exposures accordingly. PnL payments will be made on a regular (daily, weekly, or monthly) basis similar to normal futures contracts, and at expiry the futures will settle into the current EVOL index level. This settlement mechanism will lead to the futures contracts converging towards the underlying price as expiry approaches.

4 Trading Mechanism, Collateral, and LP Positions

4.1 Trading EVOL Products

For V0 of the protocol, trading will be done in a similar manner to Perpetual Protocol, with a primary central clearinghouse contract and an underlying "virtual" Uniswap V3 pool as the pricing mechanism. All interactions and changes to positions will be done via the clearinghouse contract in order to maintain a record of collateral levels for all positions that are taken. EVOL will be quoted as $\sigma * 100$, ie. if the calculated volatility level is 80%, the EVOL level will be 80, with tick size of 0.05.

4.2 Collateral

The goal of the EVOL trading protocol is to provide an undercollateralized mechanism of gaining direct exposure to volatility. Volatility levels in derivatives markets are of course very volatile themselves, so when deciding a collateral level we have to balance the ability to establish leverage with the security of knowing any buyer/seller has the capital to pay off any losses. To start, USDC will be the only accepted collateral (more to be added in the future), and initial collateral levels will be set at 40% of notional value, with a maintenance margin of 30% of notional value. The protocol will serve as a "clearinghouse", where both sides of the trades will post collateral, PnL will be calculated, and settlements will be paid out. On a (DAILY/WEEKLY) basis, trade/funding PnL will be calculated and added/subtracted to a users position collateral. If their collateral falls below the maintenance level, a liquidation warning will be put in place for the user. After the liquidation warning has been established, the user will have 48hrs to top up their collateral to the maintenance level, otherwise their position will go through the liquidation process.

4.3 LP Positions

5 Future work

The three key features on our future roadmap are: expanding to different underliers such as BTC, APE, and other popular coins with vibrant option markets, allowing for collateral beyond USDC, and adding a retail vault strategy. The retail vault will behave similarly to other DOVs that have grown in popularity in recent months, however instead of just selling short-term volatility, our vault will take advantage of the other DOVs selling 1 week vol by buying 1 week vol futures, and selling 1 month vol futures. In normal markets, longer dated vol will trade at a premium to shorter term vol, so by selling 1 month we hope to make money on the contract prices coming down over time. To hedge these positions, the vaults will buy 1 week vol, which will be priced at a discount to 1 month vol thanks to the large amount of short dated selling from DOVs, so traders and market makers taking the other side of those trades would be willing to offload short dated vol at a discount.