

Intro

We're getting closer and closer to Marginly's mainnet launch. One of the tasks that we've prioritized is the systematic approach to pool parameter settings. In this piece, we will outline the underlying process in greater detail.

The first L2 network we aim to launch Marginly is in Arbitrum. Arbitrum is a leading L2 solution with great DAO and [foundation](#) support. Arbitrum L2 is well known for its strong perp DEX DeFi. Protocols like GMX, GNS, and MUX all operate on Arbitrum, while there are numerous others that mimic their functionality. The leveraged trading landscape is very competitive in Arbitrum, and Marginly fits perfectly into this paradigm: we build innovative leverage primitives that push the boundaries of DeFi further forward.

Pools

Marginly is a permissionless leverage protocol. We have built Marginly's business logic and smart contracts with dependence on Uniswap v3 pools and TWAP oracles. This fact makes Marginly a fully decentralized leverage primitive. This also means that anyone can open their own pool as long as there is a corresponding uniswap v3 pool. However, traders are not limited to speculating only on the Uniswap. Marginly supports every major Spot DEX inside Arbitrum via our custom-built router.

We plan to open 6 pools for the mainnet launch. Corresponding Uniswap v3 pools with their respective (at the time of writing) liquidity are presented in the table below.

Pool	Base liquidity	Quote liquidity
ETH/USDC	3.53K ETH	15.56M USDC
BTC/ETH	160 WBTC	5590 ETH
ARB/USDC	1.36m ARB	1.69m USDC
ETH/GMX	67.8k GMX	0.87k ETH
PEN/ETH	2.27m PENDLE	458.55 ETH
RDNT/ETH	3.55m RDNT	146.37 ETH

Risk parameters

To launch smoothly and mitigate possible risks related to volatility and liquidity of underlying assets, we need to carefully consider consistent values for all of the [Marginly pool parameters](#)

In this article, we would like to outline the details behind risk-related parameters. These parameters are the following:

Parameter	Description
Maximum Leverage	Maximum allowed leverage inside Marginly pool. In general, the less liquid the corresponding uniswap v3 pool and the more volatile the underlying asset, the less the max leverage should be. We've covered a detailed approach to picking the maximum leverage for each asset based on historical and statistical simulations in our article about associated risks.
Interest Rate	Volatility is used as a proxy for calculating interest rate parameters for assets within Marginly. The higher the volatility the steeper the final interest rate curve for an asset will be. We describe the mathematics behind the interest rate calculations in Marginly in the Loan Pricing section of Marginly docs.
TWAP	Oracle computes an average of the spot price on Uniswap v3 for an asset over some time period. It produces a time-weighted average price (TWAP) for an asset, rather than just a current price. This parameter specifies the length of the Uniswap v3 Oracle TWAP parameter in seconds.
Liquidity Limit	This is a limit on token balances inside each Marginly pool. The less liquid the corresponding Uniswap pool, the less liquid the matching Marginly pool should be. Otherwise, there is a risk of severe price impact when users leverage Marginly pools.

Table 1: Marginly pool risk-related parameters

Now let us briefly cover the steps we take to define each of the parameters above.

Maximum Leverage

1. Fit historical returns to Jump-Diffusion distribution: find mean, standard deviation, and jump intensity.
2. Simulate 10000 1-year return series using estimates from above.
3. Calculate the average worst 1% daily return over all simulations.
4. Calculate max leverage = $1 / \text{worst return}$.

It's worth noting here that tokens besides BTC and ETH don't have sufficient price and return history, as they're relatively new. We take this into account by further adjusting calculations for ARB, PEN, GMX, and RDNT tokens.

This process gives us the following values of the maximum leverage parameter for each pool (we adjust the values slightly to make them whole numbers, actual values we got from simulations are specified in parenthesis):

Pool	Maximum Leverage
ETH/USDC	10 (7.8)
BTC/ETH	10 (8.8)
ARB/USDC	10 (10.89)
ETH/GMX	5 (4.89)
PEN/ETH	4 (3.81)
RDNT/ETH	3 (2.88)

Table 2: Marginly pools maximum leverage values

Interest rate

In Marginly, interest rate is proportional to asset volatility. To assess volatilities we follow this approach:

1. Calculate volatility cones and historical volatility distributions and come up with volatility estimates.
2. Find Normal confidence intervals for our volatility estimates.
3. Use upper confidence value for volatility parameter for interest rate parameter calculations.

We use daily volatility figures and the numbers are as follows:

Pool	Volatility
ETH/USDC	6%
BTC/ETH	6%

ARB/USDC	6%
ETH/GMX	10%
PEN/ETH	10%
RDNT/ETH	12%

Table 3: Marginly pools volatility estimates for base tokens.

We then set interest rate parameters from volatilities by using a scaling coefficient which is by default set to 15 (to roughly target the 100% interest rate at maximum volatility).

More details on the process of volatility estimation are described in [Marginly docs](#). Newer instruments like the PENDLE (PEN) token, for example, don't have enough return data for historical volatility to be approximately normally distributed. Rather, volatility distribution looks like a mixture of two normal distributions with two distinctive peaks. In this case, we consider the right hand side confidence interval of the right peak:

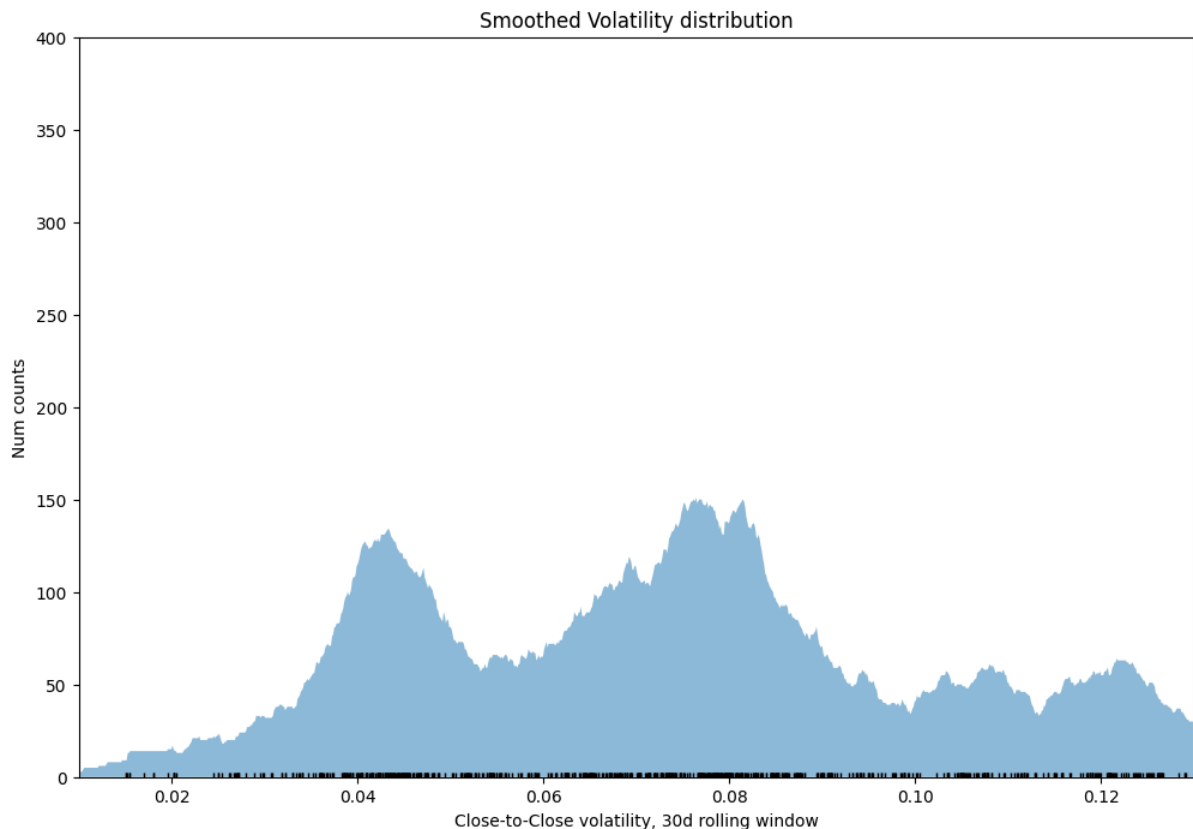


Fig 1. Pendle historical volatility distribution

TWAP

An increasing number of DeFi protocols, Marginly included, use Uniswap v3 price oracles. These oracles take the average of the spot price on Uniswap v3 for an asset over some specified period in the past and provide time-weighted average price (TWAP) for an asset, rather than current price.

Although truly decentralized, and much more resilient than the spot prices available on-chain they are nonetheless still [susceptible to manipulation](#). It is crucial for protocols and liquidity providers (LPs) to understand and be able to quantify the risks involved in using these oracles.

At Marginly we've adapted the great uniswap [oracle attack simulator](#) by [Euler Finance](#) to work with Arbitrum-based uniswap pools. We then analyze how much capital is required to move 30 min TWAP up or down the worst 1% simulated daily return within 1 block. All the assets except for RDNT and PEN are not susceptible to these kinds of attacks as they require hundreds of millions of dollars to execute. However, since both PEN and RDNT token pools are not very liquid, they require anywhere around \$1M in attack funds and \$500K in costs to manipulate. This is why we propose to use one-hour TWAP for these tokens.

Liquidity Limits

As a general rule of thumb Marginly pool is an aggregate trader on corresponding uniswap pool. We don't want this trader to become large enough to affect uniswap liquidity and prices in any material way.

We've analyzed current and historical liquidity levels in all of the corresponding Uniswap v3 pools and derived approximate liquidity limits based on the price impact that they can have if traded all at once on uniswap. We wanted this price impact to be less than the worst 1% simulated daily return. Here's what we ended up with (The last column contains the limit we will use for the pool):

Pool	Base liquidity	Quote liquidity	% impact (1/Lmax)	+ impact USD value	- impact USD value	Quote Limit
ETH/USDC	3.53K ETH	15.56M USDC	14,7%	>10m	6.5m	10M USDC
BTC/ETH	160 WBTC	5590 ETH	11,3%	1.5m	6m	2000 ETH
ARB/USDC	1.36m ARB	1.69m USDC	9.1%	1.5m	1.2m	1M USDC
ETH/GMX	67.8k GMX	0.87k ETH	20,4%	1.5m	1.1m	500 ETH
PEN/ETH	2.27m PENDLE	458.55 ETH	26,2%	1m	750k	100 ETH
RDNT/ETH	3.55m RDNT	146.37 ETH	34,7%	700k	300k	100 ETH

Table 4: simulation of price impact on supported uniswap v3 pools

Other parameters

Other pool-related parameters that we need to carefully assess relate to protocol fees, minimum trade parameters and slippage. The trickiest here is probably the slippage: you can educate yourself about this problem in greater detail by reading this excellent [Uniswap blog post](#)

In Marginly we set the slippage parameter to 1% by default for all supported pools. Fees are also unified: users will pay 0.1% swap fees when they open and close leveraged trades, as well as a 2% interest fee on top of the standard interest rate. As for minimum traded amounts they are all around \$1 - \$5:

Pool	Min. Pos
ETH/USDC	0.001 ETH
BTC/ETH	0.0001 BTC
ARB/USDC	1 ARB
ETH/GMX	0.1 GMX
PEN/ETH	1 PEN
RDNT/ETH	10 RDNT

Table 5: minimum position values in base tokens