Summary:

The goal of this framework is to set the relevant parameters concerning thecorrelated asset price oracle, referring to the expected annual growth of a correlated asset (maxYearlyRatioGrowthPercent)

, such that we can deter against unexpected, artificial inflation in the underlying staking rate. For example, if an EOA is actively the source for an oracle feed being utilized on Aave, and a malicious actor gains access to this address in an attempt to artificially pump the exchange rate, this could lead to large amounts of bad debt. Thus, in setting this “upper bound” regarding the maximum expected growth of the asset over time, we can deter this event from theoretically occurring. In doing so, there are two discrete parameters to derive:

- maxYearlyRatioGrowthPercent -

Expected annual growth of the correlated asset. For example, wstETH growth annually vs ETH, in the form of the underlying ratio scaling over time, normalizing to an annual growth rate calculation. We will formally refer to this parameter as r_{upper} throughout this piece.

- Frequency of ratioReferenceTime

updates -

The frequency of the times at which the annual equivalent growth in the asset ratio is measured from, to then calculate the aggregate APY.

Additionally, a new important parameter has been instituted within the implementation:

- MINIMUM_SNAPSHOT_DELAY -

How much “in the past” the ratio should be taken from, before the ratioReferenceTime.

We elaborate on the exact motivation and derivation behind this parameter later on in this framework.

In this analysis, we aim to adequately tailor parameter values for respective assets, based on the maximum organic rate and rate volatility of the asset, negative market price deviations from the exchange rate, and granularity of reward distribution.

maxYearlyRatioGrowthPercent:

Market Price Deviations Between the LST and the Underlying:

How are Organic Annual Rates Derived?

Motivation Behind MINIMUM_SNAPSHOT_DELAY

Recommendations with Different MINIMUM_SNAPSHOT_DELAY Values:

- note that the cbETH market utilizes the cbETH/ETH market price, not the underlying exchange rate. Thus, do not include the market price deviations.
- We observed an extreme spike in May 2023, due to a withdrawal bug. The rate collapsed to 0 for the two weeks during the bug fix as well. Thus, in our approximation, the rates returned are quite high, with the 14-day MA sufficiently smoothing this out.

Post-bug, we can see that the expected frequency and rate of streamlined rewards are quite consistent with minimal volatility.

MINIMUM_SNAPSHOT_DELAY Recommendations:

ratioReferenceTime Update Frequency:

Given our derivations above, whereby we parameterize according to the MINIMUM_SNAPSHOT_DELAY,

there is no theoretical risk of frequent ratioReferenceTime

updates. However, on the contrary, a lagging ratioReferenceTime

during an organic rate spike would be suboptimal. Therefore, we recommend a monthly update frequency, as it allows us a reasonable amount of time to realize an uptick in the staking rate trend while defending against stark manipulation.

Stablecoins:

As there is no expected growth in the underlying asset to approximate, the only parameter in need of setting is the price cap, which we will call c_{upper}.

We elaborate on this element below.

LUSD:

All other Stablecoins (USDC/USDT/DAI Cross-chain Wrappers, etc):

Recommendations

Ethereum

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

wstETH

7 days

monthly

8.72%

N/A

rETH

7 days

monthly

7.5%

N/A

cbETH

7 days

monthly

8.10%

N/A

sDAI

7 days

monthly

10.15%, subject to native governance

underlying DAI

sFRAX (for future reference)

7 days

monthly

7.1%, subject to native governance

N/A

LUSD

N/A

N/A

N/A

10%

USDC

N/A

N/A

N/A

4%

USDT

N/A

N/A

N/A

4%

DAI

N/A

N/A

N/A

4%

crvUSD

N/A

N/A

N/A

4%

FRAX

N/A

N/A

N/A

4%

Aribturm

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

wstETH

7 days

monthly

8.72%

N/A

rETH

7 days

monthly

7.5%

N/A

LUSD

N/A

N/A

N/A

10%

USDC

N/A

N/A

N/A

4%

USDC.e

N/A

N/A

N/A

4%

USDT

N/A

N/A

N/A

4%

FRAX

N/A

N/A

N/A

4%

USDC.e

N/A

N/A

N/A

4%

Optimism

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

wstETH

7 days

monthly

8.72%

N/A

rETH

7 days

monthly

7.5%

N/A

LUSD

N/A

N/A

N/A

10%

USDC

N/A

N/A

N/A

4%

USDC.e

N/A

N/A

N/A

4%

USDT

N/A

N/A

N/A

4%

sUSD

N/A

N/A

N/A

4%

DAI

N/A

N/A

N/A

4%

EURS

N/A

N/A

N/A

4%

Polygon

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

wstETH

7 days

monthly

8.72%

N/A

MaticX

14 days

monthly

7.98%

N/A

stMATIC

14 days

monthly

8.85%

N/A

USDC

N/A

N/A

N/A

4%

USDC.e

N/A

N/A

N/A

4%

USDT

N/A

N/A

N/A

4%

agEUR

N/A

N/A

N/A

4%

DAI

N/A

N/A

N/A

4%

Avalanche

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

sAVAX

14 days

monthly

8.25%

N/A

USDC

N/A

N/A

N/A

4%

USDT

N/A

N/A

N/A

4%

DAI.e

N/A

N/A

N/A

4%

FRAX

N/A

N/A

N/A

4%

Metis

Asset

Price Cap

m.USDC

4%

m.USDT

4%

m.DAI

4%

Base

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

wstETH

7 days

monthly

8.72%

N/A

cbETH

7 days

monthly

8.10%

N/A

USDC

N/A

N/A

N/A

4%

USDbC

N/A

N/A

N/A

4%

Gnosis

Asset

MINIMUM_SNAPSHOT_DELAY

ratioReferenceTime

maxYearlyRatioGrowthPercent

Price Cap

wstETH

7 days

monthly

8.72%

N/A

USDC

N/A

N/A

N/A

4%

sDAI

7 days

monthly

10.15%, subject to native governance

underlying DAI

EURe

N/A

N/A

N/A

4%

xDAI

N/A

N/A

N/A

4%

BNB

Asset

Price Cap

USDT

4%

USDC

4%

FDUSD

4%