Summary

We provide an initial feasibility study for a class of “surplus capturing” AMMs, dubbed Feedlot

, that derive their pricing from the uniform clearing price (UCP) of the CoW batch auction. This work is the outcome of a grant funded by CoW DAO. The full report can be foundhere.

The goal of our design is to offer automated liquidity while protecting LPs from the adverse selection inherent in standard CFMM designs (like Uniswap). Such designs theoretically eliminate loss-versus-rebalancing (LVR), and hence allow better control of the redistribution of trading surplus between traders and LPs, taking the driver’s seat back from arbitraging MEV bots.

In the report, we review general security principles for CFMM design, trading on a price oracle, and batch auctions. We discuss the economic implications for traders and liquidity pool providers and support the discussion with the results of empirical studies.

Findings

Security

- A pool that trades at the oracle price is vulnerable to oracle manipulation attacks. In the case of Feedlot, manipulating the oracle is as simple as providing liquidity to the CoW solver at the price one wishes the oracle to spit out. We describe several different security scenarios under which such attacks are possible.
- We introduce an informal notion of manipulation resistance

, which is a necessary economic security requirement for a Feedlot pool to be an attractive investment for LPs. We find that volume controls, normalised in terms of the volume on CoW, are needed for manipulation resistance.

CoW UCP as an oracle

- We found that the CoW UCP historically has performed very well as a price oracle (on the high volume pair WETH/USDC) in the sense that it tracks the Chainlink price much more closely than Uniswap v3 spot prices. Moreover, over many periods the CoW UCP updated more frequently than the Chainlink feed.

[

1273×430 41.4 KB

](https://europe1.discourse-cdn.com/business20/uploads/cow/original/1X/082d8ec07a23a0b9c2261128d79ac62cd12ff066.png)

In particular, traders get very tight spreads on CoW compared with Uniswap v3.

Feedlot LP yield

- We simulated LP portfolio returns for a simple Feedlot AMM implementation using passthrough pricing with on-chain univ3 historical orderflow data. The Feedlot pool, lacking the portfolio control properties of a CFMM, is unstable, highlighting the need for a pricing curve to make an oracle pool interesting for LPs.

Further Research

- Develop precise quantitative models to estimate the cost and marginal proceeds of manipulation (and hence manipulation resistance) when prices are sourced from a controlled selection of venues.
- Study ways to control solver incentives through adjusting rewards and the batch auction objective function.
- Investigate extensions of the UCP oracle approach to other applications of price oracles such as collateral liquidations and options.