PowerPool introduces LUSD-staBAL MetaPool fully utilizing advantages of v2 infrastructure

# Introduction

* MetaPools are common solution for bridging liquidity between DAI/USDT/USDC and other stablecoins on Curve protocol, for example, USDP LUSD USDN vs 3CRV
* Stablecoins are productive assets and can generate cashflows not related to rewards/swap fees in AMMs. A good example is LUSD with its Stability Pool allowing to generate a yield from Liquity protocol Stability Pool
* If LUSD can be staked in Liquity protocol Stability Pool, we can use it as a productive asset utilizing Balancer v2 LUSD asset manager developed by PowerPool
* staBAL is a 3pool analog at Balancer v2, containing DAI/USDT/USDC tokens. Liquidity provision in this pool is rewarded by Balancer liquidity mining program, allowing to mine BAL using staBAL LP token
* All mentioned above can be used for creating LUSD-staBAL meta-pool offering around 14% APY by means of **redirecting** yield from LUSD Stability Pool and staBAL liquidity mining program to the LUSD-staBAL pool.
* It is the first of its kind meta-pool that can offer such APY WITHOUT any additional rewards, token emission, etc; swap fees can add yield on top of that;
* Such meta-pool can be considered as Vault built on top of StableSwap Balancer v2 with asset managers. It is a Structured Investment Product launched as a hybrid of StableSwap pool and Vault and the same time.

# LUSD-staBAL meta-pool simulation experiment

We decided to make simulations based on available on-chain data to understand details of such pool operation, including pool composition at every simulation step and yield generated.

The logic behind the model is described below.

Simulation starts on a timespan of 30 days with 1 hour interval of main steps and Liquidation events.

* For every step in the time grid we calculate the increment of the total LQTY tokens (in other words – total LQTY emission during the previous hour). We consider these LQTY minted as the rewards for SP liquidity providers. Multiplied by the share of our LUSD assets in the SP, this amount is added to the pool’s balance.
* If on any step of the simulation the balance of LQTY exceeds a certain amount, we perform a simple trading operation: LUSD\_bought = LQTY\_sold\*LQTY\_price/LUSD\_price\*0.9.
* The same is done for BAL rewards.
* The Liquidation events are processed at separate timesteps between the main points of the timespan, corresponding to their occurrence. The balances of LUSD and ETH of the pool are recalculated according to the amount of LUSD burned in SP and ETH distributed to SP liquidity providers. ETH is sold with the same algorithm as LQTY at the main timesteps.

LQTY rewards are calculated based on the Pool's share of LUSD in the Stability Pool. The amount of LQTY rewards is calculated as follows:

The on-chain data included the following fields, mainly related to the LUSD token and Stability Pool (SP):

* Total LUSD emission
* Share of LUSD tokens in Stability Pool
* Total LQTY minted
* LQTY amount staked in the mining protocol
* LQTY circulation
* Liquidations’ information:
  + LUSD burned in the SP
  + Collateral ETH transferred to the SP LPs
* ETH, BAL and LQTY price (the average price per each day)
* Several assumptions were made to compensate for the unavailable on-chain information:
* The price of staBAL token grows linearly due to the accumulation of the fees in 3pool
* The APR of 3pool was assumed to be constant at 7%
* To account for the gas price and trading fees, every trading operation (e.g. exchanging LQTY for LUSD) was multiplied by 0.9, derived empirically
* The existence of the LUSD:staBAL pool had no influence on the outer market
* Our assumptions: (1) staBAL LP token value grows linearly based on fees accumulated in DAI/USDT/USDC pool over time; (2)
* We retrieved on-chain data for LUSD Stability Pool & Liquity Protocol liquidations...and simulated performance of this pool on period of 90 days [date start, date end] - механика добычи ончейн данных, откуда мы их взяли и как
* The on-chain data was retrieved from dune.xyz Liquity dashboard by username Dani.
* The model simulated the performance of the pool for a period of 90 days, with a resolution of 1 hour. Start date: 2021-07-0100:00:00, end date: 2021-09-29 11:00:00.
* Liquidation events occurred in between the main grid points. These events were processed separately from general balance update. For example:
  + Balance updates according to the APRs and, optionally, trading/restaking is performed
  + Liquidation occurs: the balance is updated according to the liquidation parameters
  + Balance updates…
  + …
* Arbitrage was not accounted for to reduce the model complexity and due to the close price of both assets of the pool.
* There was no arbitrage agent since there was no serious arbitrage gap over this period

# Discussion

* The simulation source code and results may be obtained at the GitHub repository: %repo%
* The general result, formulated in the averaged APR, is following:
* LUSD part of the pool: 22.3%
* staBAL part of the pool: 6.3%
* During the research it was noticed that almost all LUSD emission is locked in the SP. The same is true for the LQTY token: of ~10M LQTY minted ~8M was staked in the reward program; this imposes a serious limitation on the ability to sell incoming LQTY for LUSD. During the model operation time a total of ~300k LQTY were sold, thus, not depleting the low-slippage amount on the outer market. However, the reaction of the market is what should be considered when similar strategies are applied in the real life.

# Conclusion