MORE Liquidity

Single-side concentrated liquidity on any AMM

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Abstract

We present *stablecoin-based smart liquidity*: single-sided liquidity provision with high capital efficiency on existing UniswapV2-compatible Automated Market Makers. This protocol builds on top of the MORE MONEY stablecoin lending protocol. Users can deposit liquidity which on the stablecoin side is leveraged up to $10x$ when forwarded to the AMM liquidity pool.

The resulting liquidity then consists of user deposited MONEY, protocol-lent MONEY on one side and the counterparty token on the other side, which can be supplied independently by protocol funds or other interested parties. Pool initiators can set a fee sharing ratio between both sides, depending on desired incentivization.

Since in many cases, new protocols have plenty of their own token but a dearth of a liquid counterparty, this protocol isolates the most in-demand component and imbues it with significantly higher capital efficiency, obviating costly liquidity provision rewards in many cases.

The stablecoin is equipped with minimum-balance guards, which allow the protocol to provide this form of lending to AMM pairs with any other token, regardless of its trustworthiness, without risk of debasement.

Pools are periodically rebalanced to their target collateralization ratio when the price moves, increasing or reducing the available liquidity in the pool.

By providing higher capital efficiency, while removing liquidity upon extreme price moves, this achieves similar behavior to concentrated liquidity as in [AZS+21], while differing in the single-sided aspect.

1 Introduction

1.1 Liquidity pools

Automated Market Maker liquidity pools in the style of Uniswap V2 (cf. [Ada20]) have found widespread adoption due to their simplicity and permissive licensing. Despite their popularity, important pain points persist:

Impermanent loss: Price moves can cause the underlying value of a liquidity pool token to decrease with no means of automatic stop-loss.

Poor capital efficiency: In order to avoid extreme slippage (price moves caused by trades) many projects require significant amounts of capital locked in liquidity pools. Since

transaction fees are distributed proportionally to locked capital, more liquidity leads to lower yield per unit deposited. As a consequence, many projects are forced to incentivize liquidity provision by handing out protocol tokens, which is hard to dial in correctly and can lead to market distortions.

Our protocol can be used to ameliorate both shortcomings. Given an advantageous fee-sharing scheme between both sides of the liquidity pool, such as all fees initially going to the MONEY side, the risk of impermanent loss for MONEY liquidity providers can be reduced considerably. While the protocol may lose some of its tokens during trading, this loss is by nature of AMM pricing automatically tied to a rising price of the token, which often is in the interest of the protocol.

Due to leverage, MONEY liquidity providers can offer larger amounts of locked capital, lower slippage, while earning transaction fees on a smaller amount of input capital, greatly reducing the need for liquidity provision incentives. Once a protocol matures, it can reconfigure the fee-sharing scheme between both sides of the pool, creating a net benefit for the protocol by owning at least half of its own liquidity.

1.2 Stablecoins

MakerDAO-style stablecoins (cf. [Tea17]) are minted as overcollateralized loans backed by non-stable currencies and protected via liquiation. Since in the general case borrows can abscond with their loans without any means of clawing back funds, overcollateralization is necessary, as well as a robust liquiation system.

Once the stable value of such a coin is established, it can be minted to be used in other controlled environments, where tokens are in some way locked so that users cannot permanently withdraw them and debasement is averted. Mintable flash loans are one example for such an application which the MoreMoney protocol supports.

Here we are presenting another such mechanism for expanding the reach of an existing lending stablecoin into a new controlled realm: AMM liquidity provision. Crucially, our approach prevents debasement by draining of borrowed stablecoin funds from the liquidity pool, keeping the loan securily locked:

Whenever the liquidity lending contract deposits new lent MONEY into the pool, it updates a minimum balance threshold for the address of the pool. In the event of an extreme price move, the stablecoin contract itself can prevent any further withdrawals from the pool, until incentivized third parties rebalance the collateralization of the MONEY side of the pool, reducing the overall liquidity provided by our protocol.

2 Protocol workflow

2.1 Basic usage

Bob wants to provide liquidity for the pair of a *Ferret-themed* token "FER" and our stablecoin MONEY on a Uniswap V2 - compatible exchange.

1. the Ferret protocol has deposited a large tranche of FER into our protocol, which is held in reserve until matching MONEY funds can be found to deposit into the liquidity pool.

2. At the current price of 1 FER $= 1$ USD, *Bob* supplies 30 MONEY to our protocol contracts.

3. The protocol rebalances its current liquidity deposits so that the target collateralization ratio of the MONEY side is met.

4. An additional 70 MONEY loan gets added, so that 100 FER (from protocol funds) and 100 MONEY liquidity get submitted to the *FER-MONEY* pool.

5. The protocol increases the minimum balance of the liquidity pool contract by 80 MONEY, preventing MONEY from being drained during sudden price moves.

Bob can return anytime to reclaim his deposited MONEY at the current reserve ratio in the pool, including any accrued fees. When *Bob* withdraws, the protocol's loan of 70 MONEY is burnt and the minimum balance is lowered.

Fees per UniswapV2-LP token position $(reserve_{MONEY}, reserve_{FER})$ jointly held by the protocol are calculated accordingly:

$$fees_{MONEY} = reserve_{MONEY} - (debt + deposit_{MONEY}) \tag{1a}$$

$$fees_{FER} = reseserve_{FER} - deposit_{FER} \tag{1b}$$

These fees can be split evenly or in any other configuration between both sides. Which means that liquidity providers may receive fees in either token. For each pair of leveraged MONEY / FER pools there exists an administrator *Carol* who can change these parameters with a time delay. There can be more than one such pool configuration and administrator per UniswapV2-compatible AMM pool. There are max leverage parameters set by the wider protocol.

2.2 Rebalancing

1. After a bull market in FER the price drops 20%.

2. Third parties are now incentivized (either by the protocol or depositors) to rebalance the collateralization ratio of the MONEY side of the pool, withdrawing liquidity in the process.

3. *Alice* observes the blockchain state and submits such a rebalancing transaction.

4. *Alice* is compensated by a flat fee, which is either taken from funds *Carol* provided or from the liquidity pools. Since this protocol is operating on an affordable blockchain, her fee may be modest, say $\$10$.

2.3 Adverse price events

If the natural price of FER dips quicker than liquidation can react, below the price at which *Bob's* liquidity pool tokens would represent less MONEY reserves than *Bob's* loan (e.g. $\$0.65$) there are two possible outcomes:

1. There is enough liquidity at lower price points; *Carol* provided her liquidity at a FER price of $\$.10$ and the overall minimum balance of the liquidity pool lies below the current reserve balance. Trading continues at the same liquidity level until rebalancing occurs, either due to liquidity deposit, withdrawal or by incentivized third parties.

2. Either *Bob* is the only liquidity provider or all the others also provided their concentrated liquidity around the same limit price point. In this case the minimum balance condition of the stablecoin *ERC20* contract will stop all outgoing trades (no selling FER and withdrawing MONEY) until the next rebalancing (which in this case would remove all single-side liquidity until new capital was provided).

In extreme price move events the protocol may resort to burning MONEY funds it did not deposit, in order to recoup its loans. Hence it is not advisable (nor capital efficient) to provide liquidity in a double-sided, non-leveraged manner next to an existing single-sided smart liquidity pool.

3 Protocol components

The presented protocol is realized as smart contracts on an Ethereum-style blockchain, drawing on a mintable stablecoin and an established *Uniswap V2* - compatible exchange.

3.1 Stablecoin with minimum balance

Our stablecoin contract offers a unique *minimum balance functionality*. When minting our stablecoin and transferring it to another address (such as a trading pair) our protocol can set a minimum balance for that address, effectively stopping anyone from withdrawing that balance from the address, be it the owner or another approved party, restricting that account's liquidity.

3.2 Liquidity provision lending

MONEY-side LPT: The MONEY side of a liquidity pool is represented by a token. Liquidity providers receive proportional shares, where new deposits receive shares proportional to existing deposits and earned fees.

Counterparty LPT: The counterparty token in the liquidity pool is also represented by a proportional token. This contract also houses the adminstration of pool parameters and wraps the reservoir of any untapped tokens.

Factory: Creates pairs of LPT

Lending contract: Rebalances and mints MONEY into UniswapV2 pools according to the smart liquidity pool config. A central singleton contract which can direct the counterparty LPT to deposit funds.

4 Risks, loss & mitigation

Extremely volatile tokens can drain the funds of the liquidity pool by require constant rebalancing. Alternatively, if fees are capped, this can lead to all liquidity being withdrawn until rebalancing incentive is replenished.

4.1 Impermanent loss

If the price of the counterparty token sinks sharply MONEY liquidity providers will be compensated in the counterpart token for the loss in value, but can still suffer some impermanent loss.

4.2 Deleveraging

If counterparty funds are exhausted, newly deposited MONEY will only lead to less leverage in the pool (since there are no tokens to pair borrowed MONEY with). A completely deleveraged pool will stop accepting single-side MONEY deposits.
If a pool is earning enough trading fees to attract an excess of MONEY liquidity, administrators can re-adjust fee distribution in favor of the counterparty token.

4.3 Liveness risk

Similar to other concentrated liquidity, if the pool is not refreshed with new liquidity in a timely manner (e.g. due to congestion or gas price spikes), liquidity pools may freeze up for trades towards the downside.
Since liquidity providers can open positions at any time and any price, such occurrences should be rare for respectable counter-party tokens.
Interested parties may also incentivize continuous liquidity provisioning from the wider public through some rewards program.

DEX interfaces can easily query the stablecoin contract to elide any trading routes trying to sell into frozen pools.

4.4 Price manipulation risk

Since rebalancing can alter the amount of liquidity provided, and resulting fees on liquidity withdrawal and deposit are affected the by current price, there is some risk of price manipulation. TWAP price oracles are used to mitigate this risk.

5 Conclusions

Our proposed protocol offers leveraged liquidity provision for pairs with our stablecoin. These liquidity providing positions exhibit some behavior similar to concentrated liquidity, with greater capital efficiency within a single-side bounded range and liquidity removal outside that range (with notable differences, since this logic is not embedded in the pool

contract itself).

All stablecoin loans are guarded against being drained, preventing any debasement of the currency, by using a minimum balance gate, applied to liquidity pool reserves.

Hence we are able to offer these contracts as an open system, lending indiscriminate of the counter-party token reputation. As such it is an ideal vehicle for new projects to achieve significant liquidity at lower cost, requiring less incentivization.

Our proposed protocol also allows UniswapV2-compatible exchanges to offer greater capital efficiency to a wider basket of assets, while requiring less incentives in the form of protocol token rewards.

References

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