Tokenomics and Alternative Capital Structures: Approaches for PoolTogether Treasury Management

pool together

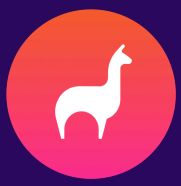
PoolTogether

PoolTogether Depositors

POOL Holders

Professional Services

Llama DAO



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Funded by PoolGrants

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Introduction

This report outlines treasury management approaches the PoolTogether community can use to enhance their current tokenomics, POOL drip strategy, and buyback program. In addition to these enhancements, there is a review of the various protocols and financial products the PoolTogether community can use to add debt to its balance sheet (which can be used to finance additional sponsorship capital or a token buyback). Over a seven-week period, the Llama DAO Working Group (hereafter, the "Working Group") researched the various protocols and financial products and analyzed the POOL drip to determine how depositors were using their claimed POOL.

The Working Group received funding from POOLGrants to conduct the research necessary to create this report, and the PoolTogether community echoed their support via Snapshot vote. The Tokenomics and Alternative Capital Structures sections of the report represent the Working Group's findings. The Llama Recommendations and Conclusion can be found at the end of this report.

Review of Scope

As stated in PTIP-26, the Working Group reviewed various approaches to increase balance sheet assets, completed high-level calculations for recommended strategies, and considered the feasibility of each approach. For recommended strategies, the Working Group estimated the resources necessary for implementation. As many protocols and financial products as possible were reviewed to provide an array of options for the PoolTogether community to consider.

Tokenomics

Overview

The subheadings below will provide a review of the existing functionality of the POOL token with subsequent changes or modifications outlined in sections that will follow this one.

POOL Token Functionality

The POOL token was launched on February 16, 2021, and the launch was announced on February 17, 2021, in the Introducing POOL Medium article, which outlined the token distribution and functionality.

To quote from the launch article: "The POOL token exists solely to govern the PoolTogether Protocol. Any changes to the Protocol will be proposed and voted on by POOL token holders.

These proposals can include things like adjusting the number of winners, launching new prize pools, integrating new yield sources, implementing scaling solutions and controlling future distribution of POOL to protocol contributors."

PoolTogether's governance uses Governor Alpha for on-chain voting, where delegates who hold 10,000 POOL (0.1% of total supply) or have 10,000 POOL delegated to them can submit a governance proposal for on-chain voting.[1] POOL Pool participants who hold pPOOL can signal their support by casting their vote in a corresponding POOL Pool Snapshot vote for the governance proposal. The POOL Pool's voting power is delegated to a Gnosis Safe multisig owned by community members, and the multisig votes in accordance with the outcome of the POOL Pool Snapshot.[2]

Governance Mandates

POOL governance exists to determine future improvements to the protocol and management of the prize pools.

Governance determines the parameters regarding prize pool rewards, yield source approvals and implementation, and if new prize strategies are implemented. Beyond this, governance can determine other alterations to the protocol such as deploying prize pools on a new chain, adding a larger number of prizes per pool, and anything else that falls under protocol improvement.

POOL holders also determine prize pool reserve rates, token faucet rewards, management of the treasury, determining early exit fees, etc.[3]

Purview of Report

In this report, Llama DAO will provide possible modifications to prize pool management and design, token faucet distributions, and management of the protocol treasury.

In the sections that follow, we will explore the first two items listed above. Modifications to prize pool management and design can ensure the protocol is only rewarding long-term depositors with governance power and token faucet drip rates are optimised to increase prize pool sizes while preventing users from farming, selling POOL tokens, and putting downward pressure on token price.

POOL Drip Analysis

The Working Group has reviewed the POOL drip to date to better inform any discussion regarding changes to the POOL drip rates. While the POOL drip is an often discussed topic in

[1] Governance 101
[2] About the PTIP | PoolTogether Improvement Proposals category
[3] Governance Managed Controls

the PoolTogether governance forum, it is important to define the Working Group's view of POOL distribution.

The Working Group views POOL drip as a way to:

1) Attract new depositors to the protocol and specific prize pools; and
2) Reward active users with governance tokens to convert protocol users into active community members

POOL rewards can then be seen as a way to secure long-term users and turn broader stakeholders into active tokenholding community members. When this view is taken into account, POOL drip rates are not purely a cost-per-user calculation. Any adjustments should reflect these two aforementioned views.

POOL Drip Findings

The Working Group used Dune Analytics to query claimed POOL for all prize pools. The query collected all of the POOL each address claimed and put it side-by-side with the users' other POOL activity. The data reflects everything POOL holders have done with the exception of transferring POOL to another address. It is difficult to distinguish simple transfers from arbitrary contract interactions; only well-defined contract interactions and total balances are included in the query. This query is intended to provide some bounds and estimates around what users are doing with their dripped POOL.

Analyzing the raw data from the query, the Working Group assumes users are not transferring POOL to other addresses to sell tokens and the max dripped POOL users are selling directly is min("Amount Sold", "Drip Received"). For example, imagine a user with 1000 existing POOL who then claims a further 300 POOL, sells 200 POOL, and then puts 200 POOL into the POOL pool (hereafter, pPOOL). Since the Working Group cannot attribute the claimed POOL directly into selling and pPOOL activity, respectively, what we can say is, at a maximum, that user sold 200 of their 300 claimed POOL, and, at a maximum, they put 200 of their 300 claimed POOL into the pPOOL. By definition this user could not have done both, but what this heuristic defines is the maximum amount of POOL they could either sell or move into the pPOOL.

Taking this heuristic as a proportion of the total dripped POOL received, then the maximum amount of dripped POOL being sold is 10.67% of the dripped POOL to date. Using a similar heuristic approach for transfers to the pPOOL, the data reflects a maximum of 22.25% of dripped POOL flowing into the pPOOL. The analysis disregards any temporal effects (e.g., a user selling POOL before dripped POOL is claimed cannot be differentiated in the queried data).

Given these results, the two most extreme hypotheses about user activity regarding dripped POOL can be discarded—users are not liquidating their POOL en masse and not all are committed users reinvesting claimed POOL into the pPOOL. The ~10% of POOL being sold and the ~20% of the POOL being deposited into the pPOOL likely represents the two extremes of the kinds of users being dripped POOL—the mercenaries selling and the committed believers

re-investing. The majority of the dripped POOL is likely simply being held passively by the bulk of users who are neither pure mercenaries nor are committed DAO contributors.

Prize Pool Management

As of PTIP-27, POOL distribution is set at 2,350 POOL/day across all pools with the largest allocation to the USDC and DAI prize pools on the Ethereum mainnet.[4] This distribution will occur over a 14-week period, which totals 230,300 POOL (2.303% of total supply) with a buyback factored in using 50% of weekly reserves to purchase POOL tokens.

When token faucet rates are changed, the underlying thought is that POOL liquidity mining incentivises depositors to put assets into PoolTogether's prize pools. One of the limitations of the current prize pool design is that long-term and short-term depositors are rewarded with the same POOL incentives.

While Yearn Finance has the largest deposit in the USDC prize pool (approximately $24,272,745.37), they also farm POOL and sell it to boost the yield within the yvUSDC 0.3.0 Vault. At current rates, Yearn will earn ~$422,159.06 over the next 14-week distribution in POOL rewards, while PoolTogether will earn $102,272.28 in reserves from the Yearn deposit, all things held equal.

Prize Pool Lockups, Longer Distribution Periods

When a user deposits funds into a prize pool, their assets are subject to a timelock. The timelock ensures every user contributes the same amount of interest to prizes they are eligible to win. The current goal, as stated in the PoolTogether 3.0 documentation, is to minimize the timelock for any user.[5] However, the reason the timelock exists is to create a sense of fairness within the protocol. The community could extrapolate the fairness principle from initial deposits to POOL drip as well.

Augmenting current POOL drip using an approach similar to BarnBridge's SMART Yield Reward program to offer a greater share of rewards to dedicated users willing to lock assets into a prize pool for a set period of time. Rewards would accrue using a time-in, value-out model, where value earned is segmented based on the asset's timelock.

Adding a time-in, value-out feature to the prize pool design could help separate casual depositors and users farming POOL from long-term users of the protocol. Currently, POOL distribution is set for 14-week periods. If users were able to lock deposits for a definite period of time and have POOL drip rewards vest, the protocol could reward long-term users and minimize the impact of users who farm and sell POOL. Below is an example of how such an approach would work using the current USDC POOL drip rate:

[4] PTIP-27: POOL incentive adjustments and buy back
[5] PoolTogether Documentation: Fairness

98,000 POOL Drip Over 14 weeks	
14-Week Lock	100% of deposit value accrues rewards
10-Week Lock	50% of deposit value accrues rewards
6-Week Lock	25% of deposit value accrues rewards
No Lock	10% of deposit value accrues rewards

To prevent users from abusing the system, the protocol could require that deposits remain locked for the full period in order to claim rewards. If withdrawn before the pre-selected date, then the rewards accrued default to 10% of deposit as if no lock had been placed on the assets.

If the goal of POOL drip is to convert protocol users to active community members, then a lock-up mechanism would further that goal. POOL farmers would have their earnings reduced by 90% unless they lock up their deposit for the duration. Extending the rewards period to 26-weeks or 52-weeks could further reduce the effects of farming, though longer lock-up periods could be seen as prohibitive for some users.

Discretionary POOL Buybacks

PoolTogether uses 50% of weekly reserves for POOL buybacks as stated in PTIP-27. These buybacks are conducted manually using a multisig funded with $100,000 in USDC. As stated in the PTIP, the current buybacks are a short-term solution and not an indefinite buyback program. The Working Group has discussed the buyback program and has determined a continuous buyback would not be a productive use of assets.

Using the values included in the POOL Distribution Analysis document included in the PTIP-27 forum post, the Working Group did a review of the cost necessary to offset sell pressure from the selling of claimed POOL.

Current distribution totals 230,300 POOL dripped over 14 weeks, which is ~$2,811,963 at a price of $12.21/POOL. A continuous weekly buyback would need to offset the amount of POOL being farmed and sold, which we can assume (in the worst case) is 10.67% of POOL dripped based on our POOL drip analysis included in the previous section. If 11% of the current distribution's value (in USD) is calculated and used as the capital needed for an effective buyback program, then PoolTogether would need $309,315.93 to conduct continuous weekly buybacks over a 14-week period.

Every week, PoolTogether would need ~$22,094 to conduct buybacks. Using the values in the aforementioned POOL Distribution Analysis document, the current weekly reserves are estimated at ~$29,331. An effective continuous buyback program would require more than 75%

of weekly reserves to create the necessary buy pressure, which seems unrealistic in the short-to-long term. It should also be noted that the community was not in favor of using 75% of weekly reserves to conduct weekly buybacks in the PTIP-27 forum discussion.

However, a discretionary POOL buyback could be a productive use of funds. If POOL were to fall below a certain price or FDV/TVL value, which would be determined by the PoolTogether community, then the protocol could execute a discretionary buyback using existing reserves, or perhaps by financing it with one of the debt instruments included in the Alternative Capital Structures section of the report.

More information regarding a strategy for discretionary buybacks is included in the Llama's Recommendations section of the report.

Liquidity Mining with Call Options, KPI Options for Sponsorship Capital

The stated goal of the protocol is to reach $1B TVL and have weekly $1mm prizes. With larger prizes, more depositors are attracted to the protocol and more revenue flows in through reserves. As Leighton stated in his article "Perpetual Growth", Sponsorship Capital plays a large role in generating larger prizes and greater reserves for the protocol. Current POOL incentives reward prize pool depositors but no incentives are regularly rewarded for Sponsorship Capital deposits. Call options could be used to incentivise a greater number of Sponsorship Capital deposits to grow prizes and increase the average depositor's chance of winning.

Call Options

Since call options are a more sophisticated financial tool, it's likely the target audience for such an incentive would be loyal community members and high-net worth investors who are bullish on the protocol's future. Attracting a large amount of capital to sponsorship would have a net positive effect on prize pool size and traditional POOL drip rewards for depositors.

Andre Cronje recently wrote about using call options for liquidity mining in his article "Liquidity Mining Rewards v2", which uses an approach developed by Pods Finance. Cronje's article outlines a hypothetical liquidity mining program using call options where:

- Strike price = spot - 50%
- Expiry = current date + 1 month

Using the above terms, users who claim and sell POOL call options would push the price down enough that there is no benefit to claiming the option and those unclaimed rewards would revert back to the DAO treasury. The profits from these options could be returned to the treasury or flow to pPOOL depositors. Call options can be created using Pods Finance, as Cronje outlined in his article, or UMA.

Pods Finance Risks

At this time, Pods Finance is finishing their demo release and a finalized launch has not yet taken place. Pods has been audited by both Quantstamp and Solidified. The protocol has a bug bounty managed by Immunefi with a critical payout of $15,000. The development team currently puts a cap on the number of tokens that can be minted for options tokens and the amount of stablecoin liquidity for options. The contracts and controls are managed by the team through the use of a multi-sig. The Pods team has catalogued the protocol risks in a Medium post, where smart contract, centralization, oracle, black swan, AMM performance, and composability risks are all noted. Pods Finance is a promising yet relatively untested protocol that has yet to launch on the Ethereum mainnet.

KPI Options

In lieu of call options, PoolTogether could choose to use UMA's KPI options for liquidity mining incentives. Key Performance Indicator (KPI) options reward holders if certain predetermined metrics are met before expiry. (Notice, that call options are essentially KPI options where the KPI in question is POOL price). A KPI option gives the holder a greater incentive to ensure the KPI is achieved so the greatest amount of rewards can be claimed.

The PoolTogether community could help determine the KPI for this potential strategy. For example: if the KPI is reaching a $100,000 weekly prize for the USDC pool, then any depositor who supplied USDC to Sponsorship Capital would have an incentive to market the USDC prize pool on social media or advertise the pool within their own network. Venture capitalists could deposit Sponsorship Capital and subsequently make a push for more depositors. In this way, a liquidity mining campaign using KPI options could serve as a way to create an incentive for deposits into Sponsorship and an incentive for a grassroots marketing campaign.

Alternative Capital Structures

UMA Range Tokens

Overview

A Range Token is perhaps best thought of as a form of convertible debt that is always settled in the underlying, and where the seller caps their downside risk. This means that PoolTogether's Treasury would mint Range Tokens that are collateralized by POOL tokens, and at expiry buyers of these Range Tokens would receive some amount of POOL determined by the price of POOL at that time. Specifically, a Range Token (from the seller's perspective) is equivalent to being short an OTM call option, long an OTM put option, and borrowing some amount of money. In traditional finance, a Range Token is very similar to a risk-reversal but with an additional debt

component that is settled using the underlying. What happens in practice is perhaps most easily explained using an example:

> Let's assume PoolTogether's Treasury sells Range Tokens that expire in a year. POOL's current price is $11, the put's strike is $5, and the call's strike is $14.85. Let's also assume the notional on each Range Token is $100.
>
> *Scenario 1: POOL price is in between $5 and $11 at expiry*
>
> In this instance, the Treasury will sell enough POOL such that each Range Token holder will receive $100 (since the notional on the Range Tokens was $100). If POOL is trading at $8, this would mean each Range Token would convert into 100/8=12.5 POOL each.
>
> *Scenario 2: POOL price is above $14.85 at expiry*
>
> Since the strike price on the embedded call option was also $14.85, this means that if POOL trades above $14.85 at expiry, each Range Token would convert into 100/14.85=6.73400673 POOL each. Note that even if POOL price significantly increases to $100 at expiry, each Range Token will still convert into 6.73400673 POOL each.
>
> This guarantees that buyers of the Range Token will receive a "floor" number of POOL tokens in the event that POOL price significantly increases. This is "bad" for PoolTogether, because PoolTogether would prefer to sell fewer POOL tokens to repay its debt; however, this feature is needed to convince investors to buy Range Tokens given any potential investors will want upside potential.
>
> *Scenario 3: POOL price is below $5 at expiry*
>
> Since the strike price on the embedded put option was also $5, this means that if POOL trades below $5 at expiry, each Range Token would convert into 100/5=20 POOL each. Note that even if POOL price significantly decreases to $0.1 at expiry, each Range Token will still convert into 20 POOL each.
>
> This guarantees that the seller of the Range Token will sell a "ceiling" number of POOL tokens in the event that POOL price significantly decreases. This is good for PoolTogether, because it would be bad to have to sell a large amount of POOL to repay the debt in the event that POOL price drops substantially. Moreover, this feature also means that PoolTogether cannot be liquidated if POOL price significantly decreases.

Possible Use Cases

Given Range Tokens settle in the underlying asset (i.e., POOL), selling Range Tokens would still result in the selling of POOL. This means that when deciding whether or not Range Tokens are a good instrument to use to finance an action the DAO wants to take, the DAO should consider whether they wish to sell POOL.

One possible scenario where it might make sense to sell Range Tokens to raise money would be if the DAO is happy to sell POOL at a higher price but not necessarily at today's prices. In other words, if the DAO would be happy to sell POOL above the embedded call's strike price, it might make sense to use Range Tokens if the DAO is confident POOL's price will appreciate beyond that level.

This makes Range Tokens a particularly good instrument to finance POOL buybacks. If the rationale behind conducting a POOL buyback is that POOL's price is currently undervalued, and the DAO were very confident that in, for example, 6-months' time POOL's price will be at least $X, then issuing Range Tokens would make a lot of sense since the strike price can be set to $X, and the DAO would likely make money if POOL's price indeed exceeds $X (the caveat being that this also depends on the implied yield when the Range Tokens were sold, more on this below).

With regards to using Range Tokens to "create" more sponsorship capital, this only makes sense if—as mentioned above—the DAO were happy to sell tokens at a higher price to finance the creation of more sponsorship capital today. Given the DAO has previously already sold tokens to this end, it might make more sense for Range Tokens to be used to finance other endeavors if they are to be used at all.

Calculations

NB: PoolTogether may or may not be able to structure a deal with these terms. The below terms use UMA's own Range Token sale as a reference, and arguably favor investors more than they favor PoolTogether.

Notional: $100
Current POOL Px: $11
Call Strike: $14.85
Put Strike: $5
Expiry: 1 year from today
Range Token Fair Value = Notional-Put Px+Call Px = 100-51.72+39.78 = $88.06
(Calculated using Black-Scholes and assuming POOL is 1.5x more volatile than ETH. ETH's implied vol. is calculated using options with similar moneyness on Deribit)

Let's assume the treasury sells these Range Tokens at 94.63c on the dollar (i.e., sold at a price of $83.33, good for a 20% yield), and sells exactly 24,001 Range Tokens to investors, raising

~$2mm. This means each Range Token will be collateralized by 20 POOL tokens each, for a total of 480,020 being posted as collateral.

Let's assume that the treasury then uses the ~$2mm it raised to purchase POOL from the open market. Let's assume that the treasury is able to purchase POOL at ~$11 and purchases 181,818 POOL.

This means that at expiry, so long as the treasury ends up selling fewer than 181,818 POOL, the transaction would have been net positive to PoolTogether. This corresponds to the following price:
100/(181818/24001) = ~$13.20
This means that under the assumptions outlined above, so long as the price of POOL is greater than $13.20 when the Range Tokens expire, PoolTogether's treasury will end up with more POOL than it started with and the transaction would have been "worth it."

It should also be noted, however, that there will be a ceiling to the number of POOL the treasury will be able to "earn" in such a transaction. Given the treasury will sell at least 24001*(100/14.85)=161,622.8956229 POOL (which only occurs if POOL's price is at least $14.85 at expiry), this means that with the assumptions above, the treasury will be able to "earn" a maximum of ~20,195.10 POOL.

Conversely, in the worst case scenario, PoolTogether also has a floor for the number of POOL it can "lose." In the worst case scenario, POOL's price falls below $5 and PoolTogether sells 20*24001=480,020 tokens. This would mean that PoolTogether would "lose" 480020-181818=298,202 POOL tokens in the worst case.

Risks, Considerations, and Feasibility

Terms

- As can be seen above, the specific terms on the Range Tokens are critical when determining their attractiveness.
    - Range Tokens are especially complicated given they have many moving parts.
    - Changing the strike prices, the expiry date, and the price the tokens are sold at/implied yield can all drastically change whether the deal is worthwhile or not.
    - Options markets for POOL are non-existent, so pricing Range Tokens using ETH as a baseline and applying an implied volatility "premium" means pricing will be crude at best.
    - It is also arguable whether Black-Scholes is even the right model to use to price crypto options given the returns in crypto are *decidedly not* log-normal.

Liquidity and Repayment

- Range Tokens are likely to be illiquid once they are sold.

- Range Tokens cannot easily be repaid; interested investors are likely purchasing Range Tokens as an alternative to buying the underlying token at spot, meaning that even if the DAO were to offer to settle the Range Tokens at their fair value denominated in USD at any point, the holder of the Range Token would likely be unwilling to take the deal.
    - The caveat is that if the buyers of the token include market makers or hedge funds/traders, then it could be more likely that they might be willing to settle in USD at some point during the life of the tokens.

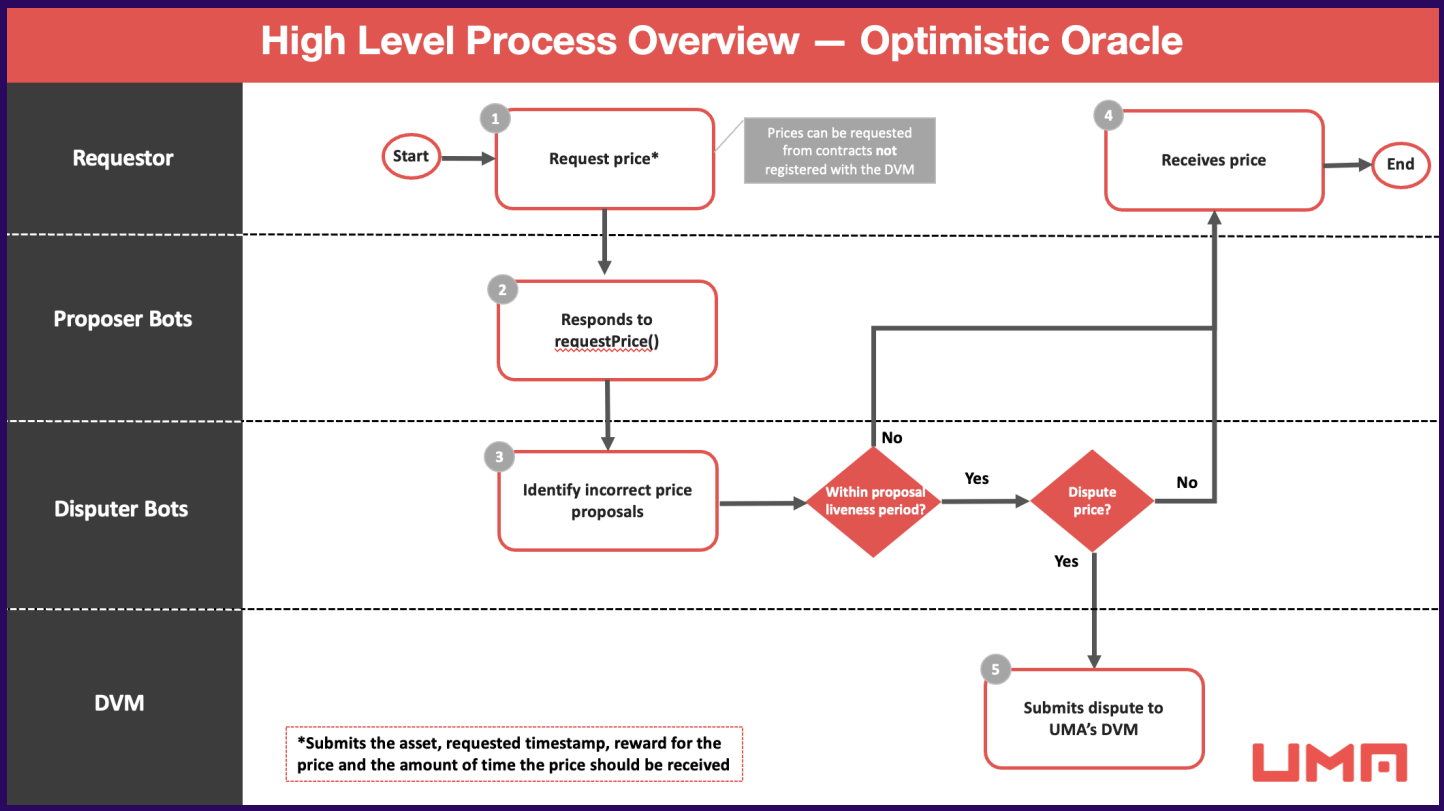
Conducting the Sale

- The initial sale of the Range Tokens will likely require reaching out to interested buyers and funds to structure a deal. Specifically, this would probably include VC funds, hedge funds, market makers, and whales in an OTC sale.
- Alternatively, we could advertise/market the sale and launch a Gnosis/MISO Auction as a more DeFi native approach of conducting the sale that is also open to the broader PoolTogether/UMA/DeFi/Crypto community.
    - There might be regulatory issues with this approach, but it has the additional advantage of allowing the community to participate in the sale.
    - Using an auction also allows the market to determine the implied yield/price/discount the Range Tokens are sold at (PoolTogether can also choose to implement a “floor” to the price of the tokens, or specify a “minimum raised amount” parameter).

Smart Contract/Oracle Risks

- Range Tokens are created using UMA smart contracts (specifically the Long-Short Pair contracts).
    - These contracts have been audited by OpenZeppelin. You can find the audit report for the LSP contract here.
    - Range Tokens have also been bought by a number of institutional investors/market makers (including Blockchain Capital, IOSG, Wintermute Trading, Amber Group, and Sybil Capital). This occurred during UMA’s recent $2.6mm raise earlier in July.
    - Though this does not mean smart contract risk has been eliminated, it does give the Working Group confidence that Range Tokens built using UMA’s contracts are adequately safe for use by PoolTogether. This is because not only has OpenZeppelin established a reputation as a leader within the industry when it comes to audits (audited PoolTogether, Compound, Aave, InstaDApp, Balancer, The Graph, Barnbridge, et al.), the fact that a number of institutional investors are willing to put their capital at risk within UMA’s smart contracts is a large vote for confidence in the safety of Range Tokens from a smart contract perspective.
    - UMA also has a standing bug bounty program, though payout amounts are low relative to other active bounty programs within DeFi.

- Range Tokens rely on UMA's oracle to determine payout at settlement. The native oracle has been live since 12/21/2020 and all updates have been catalogued here. Below, the Working Group outlines the fundamentals behind the security and reliability of UMA's native oracle:
    - UMA's implementation is what is known as an "Optimistic Oracle," and it is based on Vitalik Buterin's schellingcoin idea from 2014:



    - UMA's contracts are priceless, which means that financial instruments built with UMA already minimize reliance on oracles and make them highly secure.
    - Given the system is "optimistic," when Range Tokens expire at maturity, anyone would be allowed to push the price of POOL on-chain to help determine settlement payouts (proposing a price would require posting an UMA bond/stake).
    - If anyone else feels this price is "wrong," they can then come along to dispute this price (and post an UMA bond/stake), which results in the dispute being escalated to UMA's Data Verification Mechanism (DVM).
    - Once the dispute is with the DVM, UMA token holders will then have a 48-hour period to vote for what they think the actual correct price for POOL was at the timestamp when the Range Tokens expired.
    - Depending on the outcome of the vote, either the initial proposer or the later disputer will lose their UMA bond/stake to the correct party.
    - This means that to corrupt UMA's oracle would require an attacker to control 51% of the UMA supply.

- Given UMA's current market cap is ~$550mm, this would be extraordinarily expensive and will likely not be profitable unless PoolTogether's Range Token sale is extraordinarily large.
- The Working Group believes that UMA's oracle system would be cost prohibitive to attack and this means that Range Tokens are an adequately safe instrument for PoolTogether to utilize.

Recommended Implementation

If PoolTogether's DAO wishes to use Range Tokens to finance a certain endeavor, the Working Group believes it would be best to sell to a combination of institutional investors and community members (contingent on legal opinion). The Working Group is happy to play a role in gauging institutional interest using its internal network. Advertising the sale through social media channels would likely be the best way to generate interest from community members and other members of the general crypto-public.

To negotiate terms, the Working Group believes the most effective course of action would be to create a Treasury Management Committee to negotiate with investors on the DAO's behalf (in a similar fashion to Leighton's role in PTIP-11/PTIP-13) and believes that basic terms (strike prices and expiry) should be determined this way. To determine the price/yield on the Range Tokens, the Working Group believes it would be best to utilize an auction (a minimum price and a minimum amount raised can be set as parameters) if possible.

Ruler Protocol Bonds

The Working Group spoke with the Ruler Protocol team and previously included a section regarding Ruler Bonds. However, it was announced on September 4, 2021, that Ruler Protocol is shutting down and the protocol will no longer be in operation. Ruler Protocol announced on August 31, 2021, that three of the main developers were leaving both Ruler Protocol and Cover Protocol. The decision to wind up both Ruler and Cover Protocols appears to be due to these core team members leaving both teams. Because of this new development, the report no longer includes an entry on Ruler Bonds.

Maple Finance

Overview

Maple Finance is a capital marketplace that provides under-collateralized loans for institutional borrowers and fixed-income opportunities for lenders. It is effectively a decentralized corporate debt marketplace focused on servicing institutions and protocols. All financing is completed entirely on-chain, offering a degree of transparency unparalleled in traditional credit markets.

The Maple Finance model has four primary participants:

- **Lenders** - Lenders provide capital into a lending pool that is managed by the pool delegate in exchange for yield. Current liquidity providers are white-listed institutions.
- **Borrowers** - Borrowers are institutions or protocols looking to utilize under-collateralized debt financing on-chain.
- **Pool Delegates** - Delegates manage lending pools on Maple's infrastructure. Every liquidity pool is managed by a single delegate that is responsible for negotiating loan terms, performing due diligence, and liquidating collateral in the event of a default.
- **Stakers** - In order to create protection for lenders, Maple uses a staking mechanism whereby stakers deposit liquidity for a yield. In exchange, their liquidity can be used to provide first-loss capital in the event of a default.

PoolTogether could partner with Maple Finance to secure a loan through an existing Pool Delegate (e.g., Maven 11). A loan through Maple Finance has the following key benefits:

- **Maple Finance's fixed terms provide a degree of certainty for PoolTogether when it comes to interest rates, loan duration, and collateral.** Since interest rates are a primary factor in calculations of feasibility, a fixed rate will ensure that PoolTogether can fully model the costs of the loan before entering into the agreement.
- **There is no liquidation risk from fluctuations in the underlying collateral value for PoolTogether.** PoolTogether would be able to collateralize a loan with a fixed amount of POOL tokens and would not be required to subsequently hedge the price fluctuations of the token. Instead, lenders assume the volatility risk of the asset. The only way PoolTogether could be liquidated is by failing to make a payment on the loan within 5 days of the scheduled due date.

Possible Use Cases

Sponsorship Capital

PoolTogether could utilize Maple Finance's infrastructure to secure an under-collateralized loan of stablecoins for use as sponsorship capital in prize pools. This could make sense if the projected growth in revenues from the increased size of the prize pools exceeds the borrowing cost of capital.

Leveraged Token Buyback

It would be possible to use a loan from Maple Finance to repurchase tokens on the secondary markets via a leveraged token buyback operation. When performing a leveraged buyback, the main consideration will be weighing the expected net benefits to token holders versus the cost to borrow. A leveraged buyback could signal positivity about PoolTogether's future growth and improve valuation metrics if paired with a burning mechanism.

Financial Modeling

Terms

- 50% - 400% collateralization
- 5% - 20% interest rate
- Tenor 6 months
- Size $1mm
- Monthly interest payment payable in USDC
- 0.5% fee. 0.25% of the fee goes to pool delegates and 0.25% to the Maple treasury

Assuming PoolTogether could secure a $1mm notional loan for 6 months, the following table details the net interest margin received after accounting for interest rates on the monthly payments, the 0.5% origination fee, and the 50% reserve rate, which would be the actual capital amount available for debt servicing after applying the proceeds to the sponsorship pool:

Stablecoin Interest Rate	5% Loan	6% Loan	7% Loan	8% Loan	9% Loan	10% Loan	11% Loan	12% Loan	13% Loan	14% Loan	15% Loan	16% Loan	17% Loan	18% Loan	19% Loan	20% Loan
0.50%	(28,750)	(33,750)	(38,750)	(43,750)	(48,750)	(53,750)	(58,750)	(63,750)	(68,750)	(73,750)	(78,750)	(83,750)	(88,750)	(93,750)	(98,750)	(103,750)
1.00%	(27,500)	(32,500)	(37,500)	(42,500)	(47,500)	(52,500)	(57,500)	(62,500)	(67,500)	(72,500)	(77,500)	(82,500)	(87,500)	(92,500)	(97,500)	(102,500)
1.50%	(26,250)	(31,250)	(36,250)	(41,250)	(46,250)	(51,250)	(56,250)	(61,250)	(66,250)	(71,250)	(76,250)	(81,250)	(86,250)	(91,250)	(96,250)	(101,250)
2.00%	(25,000)	(30,000)	(35,000)	(40,000)	(45,000)	(50,000)	(55,000)	(60,000)	(65,000)	(70,000)	(75,000)	(80,000)	(85,000)	(90,000)	(95,000)	(100,000)
2.50%	(23,750)	(28,750)	(33,750)	(38,750)	(43,750)	(48,750)	(53,750)	(58,750)	(63,750)	(68,750)	(73,750)	(78,750)	(83,750)	(88,750)	(93,750)	(98,750)
3.00%	(22,500)	(27,500)	(32,500)	(37,500)	(42,500)	(47,500)	(52,500)	(57,500)	(62,500)	(67,500)	(72,500)	(77,500)	(82,500)	(87,500)	(92,500)	(97,500)
3.50%	(21,250)	(26,250)	(31,250)	(36,250)	(41,250)	(46,250)	(51,250)	(56,250)	(61,250)	(66,250)	(71,250)	(76,250)	(81,250)	(86,250)	(91,250)	(96,250)
4.00%	(20,000)	(25,000)	(30,000)	(35,000)	(40,000)	(45,000)	(50,000)	(55,000)	(60,000)	(65,000)	(70,000)	(75,000)	(80,000)	(85,000)	(90,000)	(95,000)
4.50%	(18,750)	(23,750)	(28,750)	(33,750)	(38,750)	(43,750)	(48,750)	(53,750)	(58,750)	(63,750)	(68,750)	(73,750)	(78,750)	(83,750)	(88,750)	(93,750)
5.00%	(17,500)	(22,500)	(27,500)	(32,500)	(37,500)	(42,500)	(47,500)	(52,500)	(57,500)	(62,500)	(67,500)	(72,500)	(77,500)	(82,500)	(87,500)	(92,500)
5.50%	(16,250)	(21,250)	(26,250)	(31,250)	(36,250)	(41,250)	(46,250)	(51,250)	(56,250)	(61,250)	(66,250)	(71,250)	(76,250)	(81,250)	(86,250)	(91,250)
6.00%	(15,000)	(20,000)	(25,000)	(30,000)	(35,000)	(40,000)	(45,000)	(50,000)	(55,000)	(60,000)	(65,000)	(70,000)	(75,000)	(80,000)	(85,000)	(90,000)
6.50%	(13,750)	(18,750)	(23,750)	(28,750)	(33,750)	(38,750)	(43,750)	(48,750)	(53,750)	(58,750)	(63,750)	(68,750)	(73,750)	(78,750)	(83,750)	(88,750)
7.00%	(12,500)	(17,500)	(22,500)	(27,500)	(32,500)	(37,500)	(42,500)	(47,500)	(52,500)	(57,500)	(62,500)	(67,500)	(72,500)	(77,500)	(82,500)	(87,500)
7.50%	(11,250)	(16,250)	(21,250)	(26,250)	(31,250)	(36,250)	(41,250)	(46,250)	(51,250)	(56,250)	(61,250)	(66,250)	(71,250)	(76,250)	(81,250)	(86,250)
8.00%	(10,000)	(15,000)	(20,000)	(25,000)	(30,000)	(35,000)	(40,000)	(45,000)	(50,000)	(55,000)	(60,000)	(65,000)	(70,000)	(75,000)	(80,000)	(85,000)
8.50%	(8,750)	(13,750)	(18,750)	(23,750)	(28,750)	(33,750)	(38,750)	(43,750)	(48,750)	(53,750)	(58,750)	(63,750)	(68,750)	(73,750)	(78,750)	(83,750)
9.00%	(7,500)	(12,500)	(17,500)	(22,500)	(27,500)	(32,500)	(37,500)	(42,500)	(47,500)	(52,500)	(57,500)	(62,500)	(67,500)	(72,500)	(77,500)	(82,500)
9.50%	(6,250)	(11,250)	(16,250)	(21,250)	(26,250)	(31,250)	(36,250)	(41,250)	(46,250)	(51,250)	(56,250)	(61,250)	(66,250)	(71,250)	(76,250)	(81,250)
10.00%	(5,000)	(10,000)	(15,000)	(20,000)	(25,000)	(30,000)	(35,000)	(40,000)	(45,000)	(50,000)	(55,000)	(60,000)	(65,000)	(70,000)	(75,000)	(80,000)

Since PoolTogether V4 will allow prize pools to switch between yield sources, the total expected blended rate should be used to identify what loan terms would make sense from Maple. It should also be noted that a small negative return on the interest rate arbitrage shouldn't necessarily preclude those terms as the difference could be construed as the cost of acquiring additional users. Given the loan proceeds will be used as sponsorship capital, 50% of the yield generated by the loan proceeds is effectively being "given away" into the prize pool.

The idea is that larger prizes might acquire more users, but this exercise only becomes profitable if 50% of the yield generated from additional user deposits can cover both:
1) the forgone yield from sponsorship capital
2) the remaining income required to cover interest payments on the loan

With the above said, however, it is also possible that additional sponsorship capital will not bring in additional user deposits in an efficient manner until some threshold—for example, when the weekly prize pool hits $1mm. In other words, CAC might remain high until a certain threshold is reached in terms of the size of the prize pool/AUM/sponsorship capital.

Risks and Considerations

Smart Contract Risk

As with any Ethereum-based protocol, there is a risk of malicious smart contract exploits. The Maple Finance smart contracts have been audited by Peckshield and Dedaub. Both reports can be found in this repository.

With any smart contract system comes risk unique to the code that underlies the protocol.

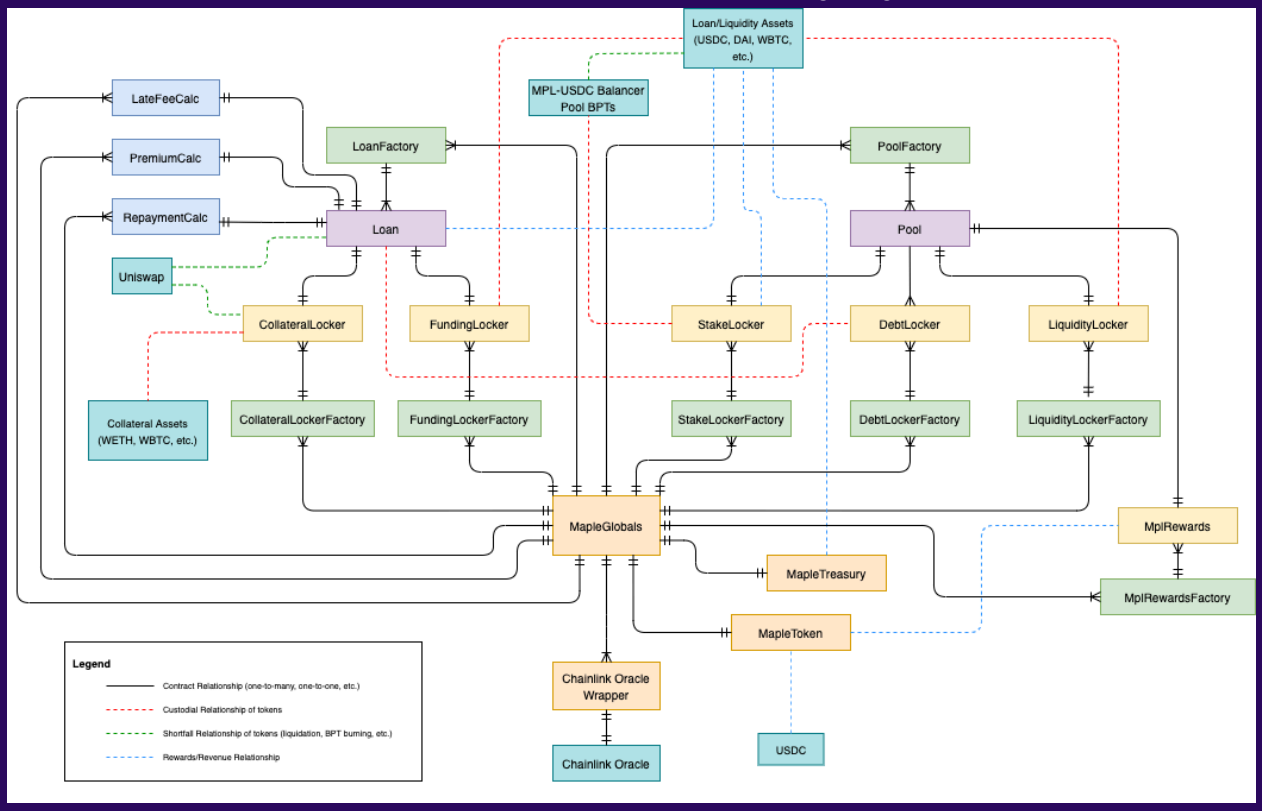
Maple Finance offers under-collateralised lending solutions to institutional borrowers such as PoolTogether.

The Maple Finance protocol uses vaults to manage liquidity that is available for borrowers to access. The core protocol and the MPT ERC-20 have been audited and reviewed by Dedaub, Peckshield, and Code 432n4 (C4). The security measures Maple Finance has taken can be reviewed in the Security repo.

Maple uses Chainlink oracles for calling off-chain data, and the C4 audit points out some low level concerns, but it is noted that it's highly unlikely that Chainlink oracles will produce stale prices. In the event stale prices are returned, the wrapper for Chainlink oracles allows for manual price overrides.

The protocol itself provides fix-rate loans with no risk of liquidation unless a borrower defaults on payment, so liquidation concerns are mitigated by this feature.

The smart contract architecture can be reviewed in the following diagram:



Concerns related to Balancer V2 and Uniswap are minimized for borrowers unless a default event is triggered.

POOL collateral would be held in the CollateralLocker.sol contract, which would be subject to liquidation through the ILoan.sol contract functionality in the event payments are missed and the loan goes into default.

For a full review of end-to-end process flow diagrams, see the following repo.

In the event of an exploit, Maple's Global Admin can step in and call setProtocolPause, which stops all external functions. This is executed by a multi-sig but due to the powerful nature of this control, it will be removed once the protocol is deemed safe and stable.

Reputational Risk in Event of Default

Since the lending process is managed on-chain, if PoolTogether were to default, it would exist on-chain indefinitely. This would make it difficult to secure capital financing in the future and may damage the reputation of DAO members.

KYC Requirements

Maple Finance requires borrower KYC to enable legal enforcement of the loan. Borrowers must enter into a Master Loan Agreement during the onboarding process. For a DAO, this may mean multisig key holders are KYC'd or otherwise contracted under a Master Loan Agreement.

Interest Rate Risk

While the interest rate is fixed, the tenor on the loan is limited to six months in duration at this time. This will require the loan to be rolled on a regular cadence. If there is an uptick in interest rates, PoolTogether may be required to roll the liability into a higher interest rate loan.

Recommended Implementation

If PoolTogether intends to proceed with securing a loan from Maple Finance, it will be necessary to begin the process by signaling the preferred loan terms. PoolTogether will need to determine the target loan amount, the requested interest rate, the collateral to be used, and the term length. This information will be reviewed with the Pool Delegate and final terms will be negotiated with PoolTogether. This process will include a confidential credit assessment of the protocol and its operational finances.

Llama recommends that the PoolTogether community analyze the potential yield strategies included in V4 and the possible blended rate the USDC, DAI, and USDT pools would generate. This information will help assess which loan terms are most favorable to the DAO before proceeding.

Sublime Finance

Overview

Sublime is a peer-to-peer lending protocol that facilitates the extension of under-collateralized loans to borrowers by using their social capital and reputation to determine overall credit worthiness.

Sublime offers a unique web3 solution to social capital/reputation-based lending services. Web2 has yet to see a market-leading social credit lending platform, likely due to restrictions and concerns around centralized data usage. Web3 is a naturally better fit for these types of systems.

With Sublime, users can utilise their reputation to access lines of credit that other users provide into borrowing pools or "savings" strategies in exchange for yield. Sublime, viewing existing under-collateralised lending solutions as suboptimal since they typically rely on off-chain data or

centralised involvement from development teams or risk pool managers, hopes to provide a more decentralized solution to the existing borrowing pool model.

On Sublime, a borrower can set up their own pool(s) using their preferred terms. The process is described as:

1. The borrower sends out a tweet announcing the creation of a pool and signs with their wallet for verification
2. Set terms for borrowing pool, which dictate the terms of the loan
3. Send out loan request
4. Borrower deposits collateral
5. Lenders assess the borrower's via past performance or reputation
6. Lenders supply liquidity to the pool, which the borrower uses to facilitate the loan

Institutions or other entities that want to remain anonymous can create off-chain agreements and access lines of credit with liquidity providers. Meant to function as a seamless flow of capital executed on-chain with off-chain terms determined between the parties involved.

When lenders supply capital to the pools, they receive pool tokens (pTokens) in return. While loans are being used, lenders can access underlying liquidity by selling pTokens on a secondary market. It was unclear from discussion if underlying collateral is locked when loans are outstanding, but it is the logical conclusion.

Debt can be serviced with the underlying collateral or in governance tokens; however, there is a possibility that debt can be serviced with stablecoins, though it was unclear if underlying collateral would be swapped for stablecoins or if stablecoins can be provided to service debt independent of collateral.

There is no firm launch date, though it was suggested a launch could happen within the next 2 to 3 months.

Possible Use Cases

Sponsorship Capital

PoolTogether could utilize Sublime's infrastructure to secure an under-collateralized loan of stablecoins for use as sponsorship capital in prize pools. This could make sense if the projected growth in revenues from the increased size of the prize pools exceeds the borrowing cost of capital.

If PoolTogether were to proceed with an ongoing sponsorship capital borrowing program, Sublime would be a unique option in that PoolTogether could accrue social capital over time, resulting in more favorable terms in the future as borrower reputation improves.

Leveraged Token Buyback

It would be possible to use Sublime to borrow capital to repurchase tokens on the secondary markets via a leveraged token buyback operation.

When performing a leveraged buyback, the main consideration will be weighing the expected net benefits to token holders versus the cost to borrow. A leveraged buyback could signal positivity about PoolTogether's future growth and improve valuation metrics if paired with a burning mechanism.

Lending Term Experiments

Borrowers on Sublime can create multiple borrowing pools with different terms. Borrowers can offer different collateral ratios and interest rates based on the risk within each pool, and lenders can assess risk and provide liquidity as they see fit. In the event a loan request (i.e., borrowing pool) fails to attract capital, the request can be cancelled and the underlying collateral can be used to create a new pool with more favorable terms.

This flexibility would allow PoolTogether to experiment with offering different risk-tranches to lenders. If multiple tranches receive capital, PoolTogether would pay a blended interest rate and potentially receive more optimal combined terms.

Financial Modeling

Interest rates within Sublime would have to match current rates within under-collateralized lending markets to remain competitive enough to attract outside capital. Therefore, an interest rate of 7-10% is projected.

Sublime has not officially launched (expected within the next few months), so it is yet to be seen which specific terms attract capital on the platform.

Risks and Considerations

Smart Contract Risk

To date, several audits have been conducted by Peckshield and Quantstamp with a third audit from Chain Security expected in November. A bug bounty is being explored with Immunefi with a possible critical vulnerability payout of $50k to $100k.

Oracle Risk

Collateral ratios within pools change based on underlying price volatility. Price is determined based on Chainlink oracle price feed within Sublime protocol, but other oracle services can be

integrated into the protocol as well. Currently, there are plans to use Uniswap oracles as a fallback in the event Chainlink oracles return stale prices.

Liquidation Risk

Margin calls are one feature used to balance collateral ratios within pools if borrower's do not add more collateral to bring up collateral ratio in the event of downward price movements. This could lead to an event where PoolTogether would be required to add additional capital to the pool to avoid liquidation.

Feasibility

As there is currently no live product, it is recommended that PoolTogether revisit Sublime sometime after launch. It would be great to see how other borrowers fare and what market-based rates attract capital on the platform post-launch. Sublime could be a great location to perform lending terms experiments in the future.

C.R.E.A.M. v2 (Iron Bank)

Overview

The Iron Bank is a protocol-to-protocol (P2P) lending solution, which gives whitelisted protocols access to under-collateralised or zero-collateral[6] lines of credit. To access lines of credit, a protocol must first pass C.R.E.A.M.'s comprehensive due diligence process; if accepted, the protocol is whitelisted and provided with credit facility. Currently, DAO-to-DAO loans such as PleasrDAO, Alpha Homora v2, etc., have terms set in private agreements that were not available to Llama at the time of writing. The line of credit product the Iron Bank offers is described below.

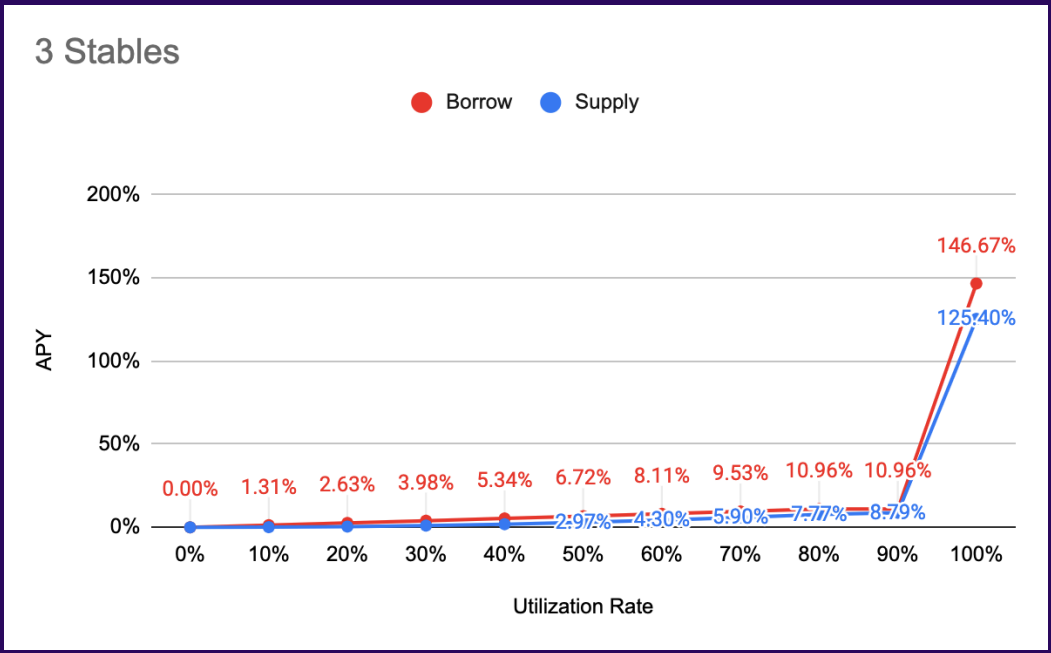
The Iron Bank reviews a variety of factors, which include "reputation, track record, smart contract audits, insurance coverage, and treasury value / liquidity."[7] Given that PoolTogether has a sterling reputation in DeFi, exceptional security measures, an established relationship with ConsenSys Diligence, and Protocol Cover available through Nexus Mutual, there is a high likelihood PoolTogether could be whitelisted through the Iron Bank.

If PoolTogether were able to utilize under-collateralised borrowing through the Iron Bank, the Borrow APY would be calculated through the function below:

[6] If a protocol requests to borrow without posting collateral, then the parameters and implementation details are determined directly with the CREAM team.
[7] C.R.E.A.M. Iron Bank Documentation.

Borrow APY = [1 + Base + Multiplier * min(UtilizationRate, Kink1) + max(JumpMultiplier * UtilizationRate - Kink2, 0)] ^ 2102400 - 1

Below is the APY vs. Utilisation Rate model for the 3 Stables pool:



Source: C.R.E.A.M. Iron Bank Documentation

It is also possible that PoolTogether might be able to directly negotiate a fixed interest rate on the loan with the Iron Bank team.

Possible Use Cases

Under-collateralized lending would enable PoolTogether to pull forward future revenues to access sponsorship capital; such an approach could create larger weekly prizes and attract a greater number of depositors in the USDC and DAI pools, which currently provide the highest contribution to PoolTogether's treasury reserves.

Having access to the Iron Bank would benefit PoolTogether in two major ways:

1) The ability to borrow stable assets to use as sponsorship capital to attract a greater number of depositors; and
2) The ability to use the Iron Bank as a yield source, which would mitigate the cost of borrowing over time, even if utilization rates are beyond 90%, and significantly increase reserves.

Only whitelisted protocols can access credit facilities through the Iron Bank, and currently only Yearn Finance, Alpha Homora v2, and PleasrDAO are whitelisted. Any user can provide liquidity

to the Iron Bank, and when utilization rates are high, depositors earn significantly more than other lending protocols in DeFi.
When PoolTogether v4 launches and the yield source can be switched to secure the greatest interest rate in the market, the Iron Bank can be a source of yield that offsets an under-collateralized loan, increases prize pool size, and brings in more protocol revenue.

Given the Iron Bank's current market, stablecoin utilization rates are low and stable borrow rates are:
USDC = 5.20%
DAI = 6.67%
USDT = 5.27%

Supply rates are:
USDC = 1.74%
DAI = 2.74%
USDT = 1.75%

Risks and Considerations

High Utilization Rates

When utilization rates increase beyond 90%, the interest rates rise beyond 100%. If a yield source other than the Iron Bank is used, this could lead to significant debt that cannot be serviced by existing reserves.

Low Liquidity

When utilization rates are high, there is less liquidy available for protocols to borrow. If a position were closed or if PoolTogether wanted to access a new line of credit, high utilization rates can result in low levels of liquidity for certain markets within the Iron Bank. This could hinder PoolTogether's ability to borrow certain assets.

Smart Contract Risk

If an exploit occurs within PoolTogether's smart contract system and either (1) results in a loss of funds or (2) results in assets borrowed from the Iron Bank, similar to the Alpha Homora v2 exploit in February, then PoolTogether would be responsible for paying back any debt incurred with the Iron Bank regardless of its origin.

The Iron Bank uses Chainlink as the main price oracle solution, and the contracts can be reviewed in their documentation. Other contracts and information can be viewed here as well.

Feasibility

Due to the current backlog of requests for whitelisting that the Iron Bank is working through, it is unlikely that a DAO-to-DAO agreement could be established in a timely fashion; as such, we will not include the Iron Bank in our recommendations section at the end of this report.

JellyFi

Overview

JellyFi is a lending platform that offers zero-collateral term loans for audited, whitelisted dApps and protocols. Before the name was changed to JellyFi, the project was called L2P for Lend to Protocols. The protocol utilizes available credit from various lending/borrowing protocols such as Aave, Compound, and Maker and provides access to protocols seeking zero-collateral loans.

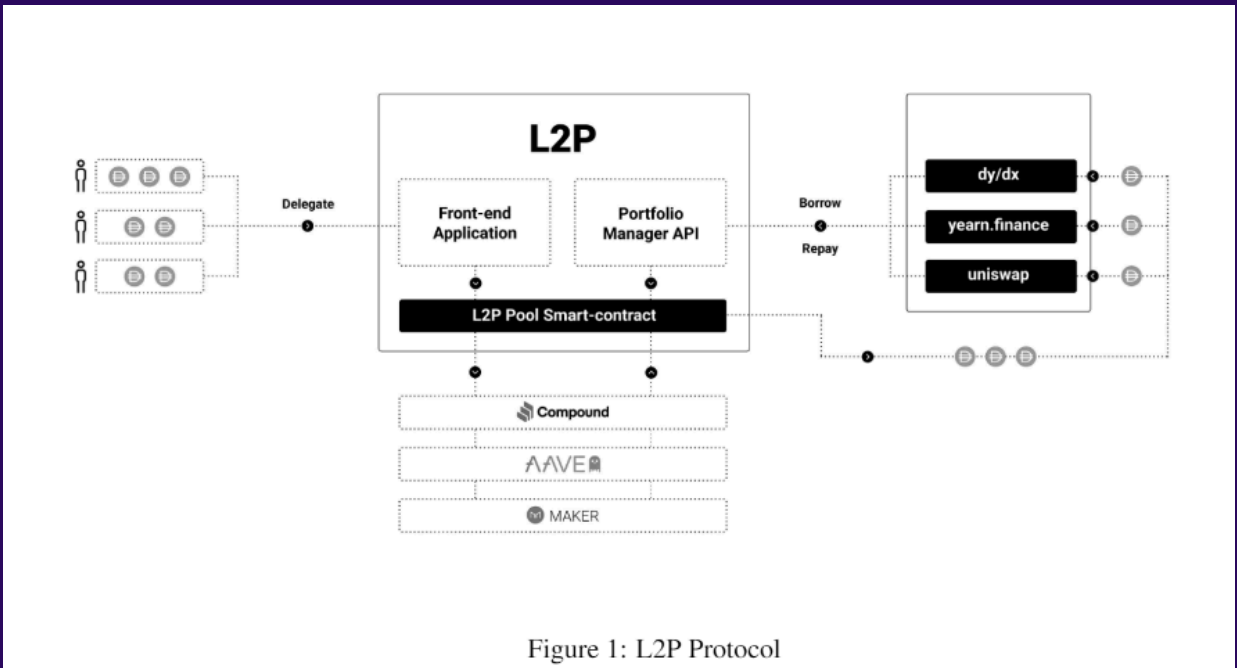


Figure 1: L2P Protocol

Source: L2P Finance Whitepaper

JellyFi uses a liquidity pool to enable lenders to deposit capital within the pool contract and that capital is then used as "collateral to borrow on over-collateralized lending protocols such as Aave, Compound, dYdX, Maker."[8]

There are two types of lenders:

1) Users with existing capital on qualified lending protocols who use collateral to delegate their lines of credit to borrowers; and
2) Users who provide liquidity directly to JellyFi

Currently, only aDAI can be deposited to the lending pool on JellyFi.[9] When lenders deposit capital into the pool contract, they receive pTokens in return. pTokens are 1:1 redeemable for underlying capital.

Protocols that have been whitelisted can use their reputation to access lines of credit without providing any collateral. Each borrower has a pool of assets distributed across several lending protocols, and the assets in the pool are used as collateral to borrow funds. When a borrower takes out a loan, the corresponding collateral is then locked, and lenders are not able to withdraw.

[8] L2P Finance Whitepaper
[9] JellyFi Documentation: Which asset can I deposit on JellyFi?

Refer to the diagram below for a visual of the borrowing process.

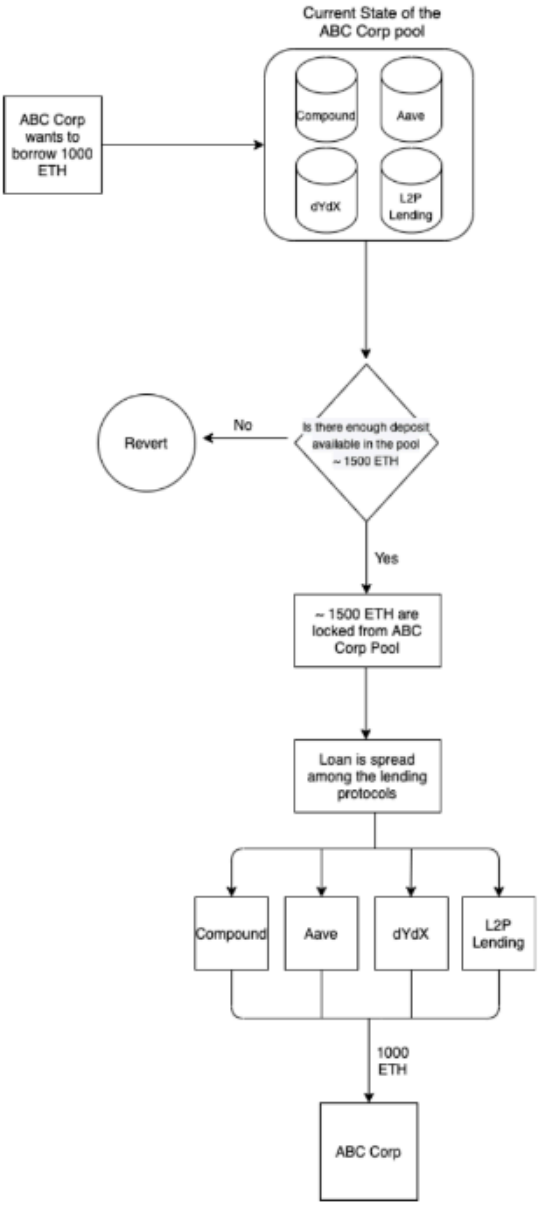


Figure 4: Borrowing on L2P

Source: L2P Finance Whitepaper

When repayment is made, a borrower pays the principal plus interest, which consists of:

1) Interest owed to lending protocols; and
2) JellyFi interest paid to lenders; and
3) JellyFi interest paid to the protocol's reserve.

After repayment, the underlying collateral is unlocked from the pool, and a borrower is able to borrow again, if desired.

If a borrower defaults on a loan, then the loss is shared among JellyFi's lenders, as the underlying collateral will be liquidated.

There are two ways to default on a JellyFi loan:

1) The borrower does not repay the loan at, or before, the maturity date; or
2) The loan is liquidated by the lending protocols before maturity due to changes in market prices. This risk will be mitigated by mechanisms within JellyFi but it is a possible risk.

If a borrower defaults, then they will not be able to use JellyFi again in the future.

Possible Use Cases

JellyFi is currently in development. Their launch is projected to take place sometime in Q4 2021 with a line of credit offered to an existing partner, but their full audit and launch will take place in Q1 2022.

Because of this, JellyFi may be a future option for PoolTogether to use once a full audit and formal launch is confirmed.

There isn't any information yet available on interest rates or maturity dates (e.g., 3-month, 6-month, 12-month maturity, etc.).

Risks and Considerations

JellyFi is still under development, and the GitHub repos for this protocol are still private. As such, not much can be said about the level of risk involved for the protocol.

However, the underlying lending protocols will introduce a variety of smart contract risks that could be difficult to anticipate. For example: Aave v2 uses their Safety Module as a backstop against under-collateralized conditions, so a loss on Aave v2 could be mitigated by the Safety Module. However, a failure within dYdX could lead to a loss of underlying collateral and could put the loan at risk of liquidation. This is a purely hypothetical example since very little information is available about the exact smart contract system and how losses within underlying protocols are handled while a loan is active.

Feasibility

Since JellyFi is not yet live, it cannot be considered at this time. After a successful launch, PoolTogether can revisit the possibility of utilizing JellyFi as a source for zero-collateral loans. When more information is available, risk can adequately be described with possible strategies for mitigation.

This strategy will not be included in the recommendations section of the report for the above stated reasons.

Llama's Recommendations

Tokenomics

Llama has reviewed the current PoolTogether tokenomics and POOL drip distribution. After the Working Group conducted the POOL drip analysis and reviewed the subsequent findings, it is clear that dripped POOL is being claimed and held by most users, while more than 20% are depositing claimed POOL into the pPOOL and roughly 11% are selling their claimed POOL. As POOL distribution continues and rewards are dripped or awarded on other chains, there will be increased friction for depositors who claim dripped or awarded POOL to deposit into the pPOOL since that pool is only on the Ethereum mainnet.

Since the Working Group views dripped POOL as a way to attract new depositors to the protocol and specific prize pools and as a way to reward active users with governance tokens to convert protocol users into active community members, our recommendations are all centered around how to distribute rewards, the optimal way to distribute rewards, and the most cost-effective way to return POOL to the treasury through buybacks.

POOL Awards

The POOL drip findings show that up to 10.67% of existing POOL dripped to depositors has been sold after being claimed. While this finding shows the overall POOL distribution has been effective, there still exists the possibility that a series of large depositors can earn large amounts of POOL tokens and subsequently sell those tokens after claiming, which will create downward pressure on the price of POOL. When PoolTogether V4 launches, POOL will be awarded as weekly prizes and there will be a cap on ticket deposits, which could improve chances for smaller fish and should reduce the chances that whales can dominate a prize pool. With this new development, POOL can be awarded to depositors in a way that increases the chances of winning; however, a depositor who wins POOL still has to deposit into the pPOOL to participate in gas-less Snapshot governance.

pPOOL Awards

The PoolTogether community has discussed ending the weekly prizes for the pPOOL and increasing the APR for pPOOL depositors. While some community members would like to retain the prizes within the pPOOL, Llama believes that ending prizes within the pPOOL would allow the protocol to use pPOOL for prize pool awards in V4.

Previously, discussion around dripping pPOOL to depositors centered around the chance that the faucet could win the prize and dripping pPOOL could centralize some power to the Gnosis Safe multisig. While possible centralisation issues could still be a concern, the chance of the faucet winning a prize would no longer be an issue. With gas costs being a concern, providing pPOOL as the prize pool award would allow depositors who win pPOOL the chance to claim their prize and then be able to participate in Snapshot governance voting.

While awarding pPOOL may not present issues if awarded across multiple chains, it would enable depositors on the Ethereum mainnet to win and claim pPOOL, which converts a depositor into a token holder with the ability to vote and participate in PoolTogether governance issues. The community has discussed moving toward cross-chain governance and providing pPOOL awards across chains would be an effective way to prepare for a future cross-chain governance strategy.

Drip for Sponsorship Capital

Creating an incentive for Sponsorship Capital deposits is one way PoolTogether could reduce the impact of whales depositing large amounts of capital and regularly winning the weekly prizes. Using different incentives for Sponsorship Capital deposits and prize pool deposits is one way to create value for different kinds of depositors. The large depositors, often referred to as whales, currently dominate certain pools and significantly reduce chances for smaller fish to win the weekly prize. These large depositors can farm and sell POOL, which creates sell pressure on the price of POOL.

The PoolTogether community could use Pods Finance call options or UMA KPI options as the incentive for Sponsorship Capital, while using POOL for awards depositors are eligible to win as the incentive for prize pool depositors. Pods Finance is a relatively new protocol and is still in its beta phase, so security issues could make Pods Finance call options a choice with more risk since the contracts are not yet battle tested.

UMA KPI options could be used as an incentive, and the target KPI could be the weekly prize pool size, as determined by the community. This would allow the community to create a greater incentive for large participants to deposit into Sponsorship Capital to increase the weekly prize pool size; this approach would benefit smaller users and if the KPI target is reached, then Sponsorship Capital depositors would receive a greater amount of POOL per KPI option held. UMA's contracts are battle tested and regularly reviewed by OpenZeppelin. In addition to this, UMA's optimistic oracle is designed to make an oracle attack more capital intensive than any

funds that could be obtained through an oracle attack. PoolTogether could purchase Protocol Cover for POOL held in KPI options contracts from Nexus Mutual to hedge against any smart contract risk. Protocol Cover for UMA is priced at 2.6% annually, with 10% of the premium reserved for the claims assessment process if a loss of funds does occur. This 10% can be withdrawn 35 days after expiry of the cover policy, which means the real cost of Protocol Cover is 2.34% annually.

Unregulated derivative products are coming under greater scrutiny from government agencies around the world, and with the use of any unregulated derivative products come the risk of unwanted attention from regulators (e.g., the US SEC). Llama believes either of Pods Finance call options or UMA KPI options could act as a compelling incentive if used for Sponsorship Capital deposits, though the Working Group believes the regulatory risk could outweigh the rewards in this case. These strategies could prove beneficial but any decision regarding call options or KPI options should be made by the PoolTogether community, as the Working Group does not offer a recommendation for these Sponsorship Capital incentives.

Discretionary Buybacks

If buybacks are used after the current buyback strategy ends, then Llama recommends the community use a discretionary buyback strategy to purchase POOL when certain market conditions are met. The community could determine that a certain price threshold or a certain FDV/TVL ratio is the condition to execute a discretionary buyback. As stated in the aforementioned Tokenomics section earlier in this report, the reserves necessary for a continuous buyback would be both prohibitive and an inefficient use of capital. Buying back POOL when predefined market conditions are met would allow PoolTogether to signal that POOL is undervalued at those market conditions.

The Working Group believes the community should decide the specific market conditions that need to be met in order to execute a discretionary buyback. Because the market moves quickly, it would be prudent to form a Treasury Management Committee that has the power to act quickly enough to execute a discretionary buyback when market conditions are favorable. The formation of a Treasury Management Committee is discussed later in the Llama Recommendations section.

Alternative Capital Structures

Over the course of this report, Llama has reviewed a number of protocols and instruments that might be used to add debt to PoolTogether's capital structure. In evaluating these protocols, Llama has chiefly focused on considering each of the protocols' suitability of being used to finance additional sponsorship capital, or to finance a token buyback. Moreover, Llama has investigated the risks entailed by utilizing each of these instruments/protocols, how they each work, and what using them would entail from an implementation standpoint. Having done so, Llama believes that the most suitable debt instrument to use to finance a token buyback is

distinct from the optimal protocol to finance additional sponsorship capital. Specifically, whereas Llama recommends the use of Maple for financing additional sponsorship capital, Llama believes UMA's Range Tokens would be more suitable in the event the community wishes to conduct a token buyback.

Maple Finance & Sponsorship Capital

Having investigated a number of protocols that might be used to borrow stablecoins without liquidation risk, Llama believes that Maple is the protocol that would make the most sense to be used in the event the DAO wishes to use debt to finance more assets to be used as sponsorship capital. This is because Maple would allow PoolTogether to borrow at a fixed rate and without liquidation risk, and also because Maple has already been audited and been operating for some time, while the competing alternatives are yet to launch (JellyFi and Sublime). Though the Iron Bank could also potentially be an option with many of the same options, the Iron Bank is currently not underwriting any new loans since they wish to resolve internal processes before they open up their balance sheet to other DAOs.

With the above said, it should be noted that using debt as sponsorship capital will be very unlikely to be an efficient use of capital (for a deeper explanation, please refer to the Maple subsection above) if the purpose of utilizing debt would be to conduct "interest rate arbitrage" given the additional sponsorship capital is unlikely to bring in additional reserve revenue that will *exceed* the interest payments; however, experimenting with debt-financed sponsorship capital could still be a valuable exercise for the DAO in spite of this fact. This is because it might be the case that the relationship between sponsorship capital and additional user deposits/reserve income is non-linear: sponsorship capital might be much more efficient in attracting new deposits when the weekly prize pool gets closer to the $1mm target. As such, experimenting with debt-financed sponsorship capital could help the DAO understand this "curve" and better determine the relationship between sponsorship capital and additional user deposits. Given this, it is Llama's opinion that the DAO should still conduct a small-scale experiment with debt-financed sponsorship capital that can potentially be scaled up in the future.

Implementation Details

Should the community agree that experimenting with debt-financed sponsorship capital is a good use of the DAO's efforts, then Llama believes that the following terms might make sense for an initial exploratory program:

- 6 month tenor on the loan
- $500k-$1mm in principal
- Interest rate to be negotiated, but likely in the 5-10% APY range
- Over-collateralize the loan 500% with Treasury POOL, since this will help in negotiating better terms and the collateral is not be open to liquidation anyway (unless PoolTogether defaults on the loan)

Given a Maple loan would entail making interest payments, negotiating specific terms on the loan, potentially rolling the loan over in the future, potential KYCing of a DAO member, and other considerations, it would make sense to create a Treasury Management Committee to negotiate and manage some of these details.

UMA Range Tokens & Token Buybacks

Recall that the optimal scenario when Range Tokens ought to be used is when the DAO is confident that POOL price will rise before the Range Tokens expire and when the DAO is also happy to sell POOL at a higher price (but not at today's prices, since the DAO believes prices are unfairly depressed). This therefore makes Range Tokens a particularly good instrument to finance POOL buybacks. If the rationale behind conducting a POOL buyback is that POOL's price is currently undervalued, and the DAO were very confident that in, for example, 6-months' time POOL's price will be at least $X, then issuing Range Tokens would make a lot of sense since the strike price can be set to $X, and the DAO's Treasury would likely come out of the transaction with more POOL than it started out with.

Although other instruments/protocols could also be used to finance a token buyback, Range Tokens make sense because it would limit the risks of the transaction not working in the favor of the DAO. This is because since Range Tokens have a floor and ceiling strike price, there will be a maximum and minimum number of POOL tokens the DAO can gain/lose as a result of using Range Tokens to finance a token buyback (for a full walk through of exactly why this is the case, please refer to the Range Tokens subsection above). Conversely, if the DAO were to use another debt instrument to finance a token buyback, the DAO's treasury could end up losing much more POOL if the debt matures before POOL price is able to go up (since the DAO would be forced to sell off the purchased POOL in addition to existing Treasury POOL to pay off the debt). Although this also means the DAO's upside can be much higher, Llama believes it is prudent to de-risk any debt-financed token buyback given the inherent volatility in crypto assets.

Implementation Details

Given the most opportune moments to execute a token buyback often do not last long, the best way to finance a token buyback using Range Tokens might be to issue Range Tokens only when the DAO is confident a number of these opportunities will arise before the Range Tokens expire. For instance, this might be during the depths of a bear market, or perhaps during a period where the market moves "sideways" (like May–August 2021). Once capital has been raised using Range Tokens, discretionary buybacks can then be performed in opportune moments without tapping into reserves/sponsorship capital.

Since Range Tokens also have a number of parameters that have to be negotiated and carefully thought through before they are issued, it would be prudent to form a Treasury Management Committee that can help negotiate these terms with the natural buyers of Range Tokens (market makers, hedge funds, and perhaps VCs). Additionally, the size of the Range Token issuance (i.e., amount to be raised) ought to also be carefully considered, and this should be determined

in relation to PoolTogether's financial health/revenue generating capabilities and market conditions and as such having a Treasury Management Committee to investigate these issues would also be prudent. The formation of a Treasury Management Committee is discussed below.

Create a Treasury Management Committee

In addition to the above, Llama recommends creating a Treasury Management Committee that reviews potential capital management decisions, analyzes ongoing tokenomics, and negotiates deals on behalf of the DAO. This committee would be under community oversight and would not be directly responsible for handling funds (e.g., custodying assets). Instead, the Treasury Management Committee would serve as a treasury consulting arm for the DAO performing a variety of functions including:

- **Negotiating terms with creditors.** This will be particularly useful during the negotiation process with Maple since PoolTogether would need to coordinate on desired terms. The simplest way of doing this would be to have the Treasury Management Committee identify preferred terms (with the oversight of the community) and be given discretion to negotiate these terms with Maple.
- **Identifying suitable terms for alternative capital structure products.** For the UMA range tokens, KPI options, and additional products in the future as use cases and needs of the PoolTogether treasury evolves, PoolTogether will need to identify specific metrics to be implemented. For UMA range tokens, it will be necessary to select specific target strike prices of the upper and lower thresholds. KPI options can be linked to a variety of metrics, and the DAO must ultimately decide what metrics they value and how those metrics might carry through to the growth of the protocol. All of these terms would benefit from having a dedicated team to research, analyze, and recommend to the broader community.
- **Ongoing tokenomics review and adjustments.** Pool and sponsorship capital drip rate modifications, discretionary targeted buyback goals/implementation, and other tokenomics experiments will all require specialized knowledge of PoolTogether, its treasury, and any associated research. For example, a discretionary targeted buyback program will require selection of price targets based on valuation metrics along with some degree of discretion/delegated powers to implement in a timely manner. The Treasury Management Committee could be responsible for target selection, oversight of multi-sig signers during implementation, and reporting back to the community.
- **Asset management.** Asset management will become an increasingly important topic as the PoolTogether treasury continues to grow. Asset selection, productivity, rebalancing, working capital management, and more fall under this treasury management function, and Llama has found many DAOs benefit from having a formalized approach to this process. This might include a Treasury Vision document which outlines the goals and objectives of the treasury for reference when making treasury decisions, an investment guideline document that creates constraints and recommendations for how the assets are managed to avoid specific risks (e.g., illiquidity, concentration, etc.), and the creation

of roles within the community responsible for day-to-day treasury management decisions, analysis of capital structure and potential investments, and maintaining a more detailed understanding of the DAO's treasury.

Many DAOs have elected to create these types of working groups for their treasuries due to the increasing complexity of asset and capital management decisions parallel to their growth. Such a group would be composed of PoolTogether community members elected by the community; community members who have been and currently are involved in these types of decisions could be the ideal candidates for the Treasury Management Committee. A community-run Treasury Management Committee could work directly with Llama, and Llama DAO could provide consulting services to this group as they form and begin implementing some of the above recommendations. The ultimate goal would be to empower the PoolTogether community to develop their own unique strategy that suits their culture while simultaneously satisfying core treasury management functions necessary for the DAO.

Llama and its members have directly assisted a variety of DAOs in formalizing this process, including Aave, Gitcoin, Index Coop, and others. As such, we believe we could assist, if the PoolTogether community so chooses, in creating this group.

Conclusion

The Working Group has reviewed an array of financial products and protocols to provide the PoolTogether community with the requisite information necessary to have an informed discussion and to determine next steps. Llama DAO would like to thank the PoolTogether community for collaborating with the Working Group and providing us with the necessary resources to create this detailed report. We would also like to thank the members of the PoolGrants committee for their guidance and direction. The Working Group looks forward to having an open dialogue with the PoolTogether community about the report. We will discuss how Llama can help if the PoolTogether community wants to further explore and implement any recommendation(s).