

In this post, we review early performance data from the Morpho Spark DAI vault and make recommendations for parameter and allocation adjustments.

## Performance and Pool Selection

The Spark DAI vault saw strong demand almost immediately upon launch. While it is too early to definitively judge relative efficiency of various LLTV pools, as they have not yet had time to reach stable equilibrium, we saw a few clear trends of user demand based on the order of pools becoming fully utilized. Users showed a strong preference for USDe over sUSDe pools, and also showed a preference for higher over lower leverage, particularly preferring pools with LLTV of 86% and above.

Users' preference for USDe (offering 7x points currently) over sUSDe (offering 5x points plus ~30% yield) suggests they are highly valuing Ethena points and opportunity to earn ENA tokens. While the points program is being [updated today](#), there will still be significant incentives for using USDe and sUSDe collateral on Morpho. Given this preference for points over cash yield, it may be prudent to allocate a greater share of DAI towards USDe pools going forward. This comes with an additional benefit of slightly lower liquidity risk for the collateral, as USDe can be redeemed via Ethena immediately while sUSDe must wait for a 1 week unstaking period before redemption. Allocation to USDe also allows Ethena to retain a greater share of revenue for their insurance fund, which over time can improve the risk profile of Maker's Ethena allocation. Ethena's revised points program ("sats" program) will continue to favor USDe over sUSDe, with 20x daily sats per USDe collateral vs 5x sats per sUSDe collateral.

We've also seen the 77% LLTV pools fill up significantly more slowly versus other pools. Based on this, we anticipate that the equilibrium borrow rates supported by these pools will be lower than alternatives, and overall efficiency (borrow rate paid divided by LLTV) may also lag higher LLTV pools.

Given the above factors, and to help reduce UX complexity caused by offering many different pools, we believe the Spark DAI vault should focus future allocations into the 86% and 91.5% LLTV pool, and more heavily weight USDe versus sUSDe collateral. The 77% and 94.5% LLTV pools can continue to see allocations but at a somewhat lower proportion of deployed assets.

## Vault Risk Factors

We conducted a review of vault risk in our previous post [here](#). In this section we review the previously identified risk factors in light of current vault and Ethena protocol status, and consider a few additional risk factors that impact the vault's risk profile as allocation size increases.

### Morpho Rate Models

Currently the Spark DAI vault's pools are all essentially fully utilized, with borrow rates below users' willingness to pay. After the ENA token generation event and adjustment of points programs, we expect willingness to pay to drop somewhat, and potentially stabilize below the then current optimal borrow rate for the pools (expected to be 50%+ for most pools by mid next week). If this is the case, utilization will fall and Maker's overall revenue will decline, while the maximum potential losses in a tail risk event will remain the same (up to the full amount deployed to the pool). Given that the next Ethena points season will run until the earlier of September or when USDe reaches \$5 billion market capitalization, this potential disruption caused by changes to the points program isn't expected to recur frequently.

### Custody and Exchange Transparency

Ethena's dashboard shows a breakdown of collateral by asset and which exchange it is currently pledged to, data as of 30 March is shown below. This breakdown is expected to closely track the distribution of Ethena's perp hedge positions across exchanges, but may not be 100% aligned as certain positions could use more or less than 1x leverage. We would like to see deeper transparency into futures hedging positions, ideally including dollar value of positions per exchange and per product (eg. linear vs inverse perpetuals, dated futures, etc). This will become more important as Ethena begins to use additional assets such as BTC for delta neutral positions, or potentially allocates a portion of backing to dated futures.

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### [Ethena Dashboard](#)

While Ethena discloses deposit addresses for off exchange custody providers, funds are currently not held in individual onchain addresses after being deposited. This limits transparency for custody balances after the point of initial deposit, and a breakdown of funds per custodian is currently not provided by either Ethena or the custodians themselves. We'd like to see improvement in transparency here as well, including live or near live data provided by Ethena and periodic (at least weekly) assertions from the custodians of AUC attributable to Ethena. Implementation of segregated onchain addresses to

hold Ethena collateral would significantly improve transparency.

We can assume that roughly 50% of collateral is held with Ceffu based on the fact that Copper and Cobo are not approved for trading on Binance, but a more thorough breakdown would be helpful for assessing overall risk to the structure. Greater transparency would also help Maker understand differences between reported collateral balances and USDe in circulation, where there is frequently a discrepancy of tens of millions of dollars, likely caused by assets under custody that have not been pledged to an exchange or delays in data reporting.

### **Custody and Exchange Counterparty Risk**

Currently (as of 30 March), Ethena reports 51% of exchange collateral (48% of total USDe backing) is pledged to Binance, by implication held at Ceffu. With Binance and Ceffu sharing the same ultimate beneficial owner, our current assessment is that they may be under common control and should not be considered independent for the purposes of assessing counterparty risk. Other custodians are independent of exchanges, and provide a higher level of assurance against misappropriation or impairment in the event of exchange failure.

We also note \$185 million of wbETH collateral (~12% of backing) on Binance and \$80 million of mETH collateral (~5% of backing) on Bybit. wbETH is a fully custodial managed product so has essentially 100% counterparty exposure to Binance. While mETH is a decentralized product managed under Mantle DAO and a security council multisig with 6 of 13 threshold, we have seen Bybit exert significant pressure on Mantle governance in the past; for example Mantle DAO voted to prevent FTX from converting BIT tokens to MNT, linked with a wider dispute between the FTX trustee and Mirana. So while mETH's Bybit exposure isn't as concrete as wbETH and Binance, there remains a non-negligible counterparty risk from using mETH as collateral while trading on Bybit.

We also note a [news report](#) about a party hosted by custodian Copper after the recent DAS conference. While this doesn't have a direct bearing on risk, it can potentially demonstrate weak management and internal company culture, and bears some similarities to the [culture issues](#) present at Prime Trust. Custodians should be expected to have better judgment and higher standards of professional conduct.

### **LST Collateral**

LST exposure at Ethena represents one of the key systemic risks of the project. If derivatives funding rates fall into the negative range and Ethena is forced to unwind delta neutral positions (either due to users redeeming USDe, or to reallocate to other collateral backing), they may end up selling a significant amount of LST collateral, pushing these assets below peg and creating a long staking exit queue. Large discounts would then tend to create further downward pressure on funding rates, as arbitrageurs would use short derivatives positions to hedge their ETH exposure when buying LSTs below peg. The presence of positive feedback loops here could severely impact LST secondary market liquidity in concentrated liquidity AMMs and destabilize defi protocols that rely on LST collateral.

Presently, liquid staking tokens comprise roughly 22% of total Ethena backing. This proportion has been falling steadily as USDe's circulating supply has grown over the past weeks, and now represents a fairly small level of exposure. The Ethena Labs team has communicated they intend to continue to reduce proportional exposure as they grow, and view LST collateral as more helpful in bear market conditions when the collateral yield is important to offset low or negative funding rates. Reduction in LST backing is positive from a risk perspective as this reduces USDe's exposure to hacks, slashing, LST custody and counterparty risks, potential discount and depegs due to liquidity constraints, and overall systemic risk to the ecosystem.

We also note that the exposure to LST collateral is now significantly below the amount of staked USDe. Given that sUSDe has a 7 day period for unstaking before it can be redeemed, this may help buffer Ethena's liquidity and duration risk from holding LSTs, as they may be able to directly redeem LST collateral if they see a rush of unstaking requests, rather than being forced to sell on the secondary market.

### **Stablecoin Collateral**

Based on reported exchange collateral data, Ethena has at least 21% exposure to USDT collateral. USDT is also the primary quote and settlement asset used for linear perpetual contracts across exchanges, and the most frequently used asset for primary market minting and redemptions of USDe. Given these exposures and touchpoints, we conclude that Ethena has existential levels of risk exposure to Tether. A significant depeg or impairment to USDT would cause severe impact on primary market liquidity for USDe and may also cause capital losses. Once the current high growth phase subsides, Ethena is expected to shift towards smaller USDT balances in the 3-5% range, just enough to cover primary market liquidity needs and PNL settlement. Shifting a portion of stablecoin collateral from USDT to USDC may help improve USDe's risk profile from Maker's perspective, as Maker already has significant direct exposure to USDC but has remained fairly insulated from Tether. Additionally, trading with inverse perpetuals or linear perpetuals with USDC rather than USDT margin may reduce this indirect Tether exposure.

### **Risk Evaluation**

Evaluating risk for Ethena requires subjective judgment, as the overwhelming majority of relevant risk factors are qualitative in nature. For example, the likelihood of counterparty risks emerging is fundamentally a qualitative assessment about

creditworthiness and competence of various entities involved in the product. We have created a workbook to aggregate loss probability distributions of various risk factors to USDe, and provided reference inputs based on our best judgement of the likelihood of various types of failures. Users are welcome to test their own assumptions for inputs to derive different outputs.

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### [sUSDe Review - 1 April 2024](#)

The primary model outputs are values for risk premia

(an annualized measure of expected losses) and probability of catastrophic loss

(potential for Maker to face losses exceeding the capacity to recapitalize through surplus buffer and debt auctions). Risk premia is useful to assess whether returns are adequate, and funds should be removed from allocation to USDe if returns are not at least high enough to cover Maker's cost of capital (DSR), the risk premia, plus a spread for profitability and to account for uncertainty of risk premia. Probability of catastrophic loss figures can help set overall exposure limits, as this value should be kept to an acceptably low limit. However, the above risk metrics are only a rough estimate, and may over or underweight certain risk factors.

When evaluating probability of catastrophic losses, we judge Maker's loss absorbing capacity to be the expected surplus buffer balance (surplus buffer upper limit) plus 5% of outstanding DAI supply; we've seen other protocols such as Frax Finance have been able to manage negative equity well above this amount for prolonged periods without facing a bank run, so this threshold seems like a conservative but reasonable estimate of Maker's financial capacity. We believe that debt ceiling should be constrained to ensure no more than 2% likelihood of exceeding this threshold, which puts catastrophic risk attributable to Ethena on par with other tail risk exposures at Maker including the protocols' internal technical risk and risks attributable to the Ethereum base layer.

## Parameter Recommendation

BA Labs recommends the Stability Facilitator to propose increasing the Spark MetaMorpho Vault DDM DC-IAM Line, corresponding MetaMorpho Vault supply caps and recommended dai allocation across the markets, which can go directly to the upcoming executive vote according to the language of the Stability Scope article 5.3.2;

### Parameter summary:

- DDM DC-IAM Parameters:
- line

: 1 billion DAI

- gap

: 100 million DAI

- ttl

: 24 hours

- line

: 1 billion DAI

- gap

: 100 million DAI

- ttl

: 24 hours

- Metamorpho Vault Parameters:
- Market Caps:
- USDe 77% LLTV pool cap: 1 billion DAI

- USDe 86% LLTV pool cap: 500 million DAI
- USDe 91.5% LLTV pool cap: 200 million DAI
- USDe 94.5% LLTV pool cap: 10 million DAI
- sUSDe 77% LLTV pool cap: 1 billion DAI
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- sUSDe 86% LLTV pool cap: 200 million DAI
- sUSDe 91.5% LLTV pool cap: 50 million DAI
- sUSDe 94.5% LLTV pool cap: 10 million DAI
- Recommended Vault DAI allocations:
- Total allocation across all pools: 600 million DAI (+ 500 million DAI)
- USDe 77% LLTV allocation: 10 million DAI (+ 5 million DAI)
- USDe 86% LLTV allocation: 330 million DAI (+ 320 million DAI)
- USDe 91.5% LLTV allocation: 150 million DAI (+ 120 million DAI)
- USDe 94.5% LLTV allocation: 10 million DAI (+ 5 million DAI)
- sUSDe 77% LLTV allocation: 10 million DAI (+ 5 million DAI)
- sUSDe 86% LLTV allocation: 50 million DAI (+ 40 million DAI)
- sUSDe 91.5% LLTV allocation: 30 million DAI
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## Reasoning

In our previous risk assessment, we recommended some general guidelines to constrain total allocation to USDe and sUSDe, limiting exposure to the lower of the following:

- 10% of total ETH perp OI - roughly 1 billion DAI
- 30% of USDe supply including Maker exposure - 600 million DAI

- 20% of DAI supply - 980 million DAI

Note that Ethena is expected to begin allocating to BTC based delta neutral positions in the near future, so futures positions will be spread across a much larger asset base and the total OI threshold will become less of a constraint. Generally, if Ethena collateral base, operations, or other key factors change, then the assessment of suitable exposure limits will also need to be revisited.

Using the lowest of the above thresholds yields 600 million maximum recommended exposure to USDe. This will scale up gradually as Ethena grows, but for the time being we believe it is prudent to cap total allocation at this level.

Additionally, we recommend limiting allocation to an amount and configuration that keeps the risk of severe losses to an acceptably low level. This minimizes the risk that Maker itself could face insolvency due to problems with USDe. The return earned on USDe collateral should also be at least high enough to compensate for Maker's marginal cost of capital (DSR) and annualized expected losses from USDe exposure (risk premium). These metrics are estimated in the risk evaluation section above. Based on our reference loss probability distribution and loss absorbing capacity estimates, we assess that Maker could allocate up to ~800 million to USDe through the Morpho vault within acceptable risk thresholds.

Based on the above metrics, we recommend limiting allocations to a maximum of 600 million DAI total for the time being. However, we recommend setting the DDM line

parameter to 1 billion DAI, to reduce the amount of governance overhead required to increase exposure in the future if relevant constraints change (for example, if USDe circulating supply increases).

While we recommend to focus deployment on the 86% and 91.5% LLTV pools based on expected risk/reward efficiency, we also recommend to marginally increase funds deployed to the 77% and 94.5% pools to 10 million DAI each (an increase of 5 million DAI per pool). Increased deposit size will ensure pools are large enough for users to efficiently manage their positions and respond to changing interest rates and collateral return. This allows Maker to gather continuing performance data from these pools with greater validity, and ensures that the interest rate models will be properly calibrated based on supply and demand if Maker chooses to allocate more funds to any of these pools in the future.

As a final note, the recently revealed Ethena points program for season 2 caps total USDe and sUSDe collateral eligible for incentives on Morpho at \$500 million. If demand to borrow DAI through the vault drops off after this threshold, the multisig should be empowered to reduce allocations below \$600 million until reaching a reasonable supply/demand balance and return profile that aligns with expected return on collateral (this can be roughly estimated by looking at Pendle YT vs PT pricing dynamics).