

WHITE PAPER

METADDEX

2022

# ABSTRACT

MetaDex is a Decentralized Autonomous Organization (DAO) governed protocol designed to facilitate its community's acquisition of metaverse-based assets while aggregating them in its treasury. The protocol is deployed on the Polygon network but has plans to extend its functionalities to other blockchains depending on their metaverse ecosystems.

In this whitepaper, we explain how the protocol's proprietary token, METADEX, provides aggregation and insurance, enabling its holders to acquire far more valuable assets than they would have if they acted individually. Additionally, elaborate on how the MetaDex protocol is designed, how tokens flow from users by interacting with the bonding curve smart contract, and how they are dispensed into the treasury for investment by the community and funding the protocol's development and expenses through the DAO wallet.

Finally, we describe the protocol's outlook on future operations - perpetually furnishing its treasury and distributing value gained to token holders.



# 1. | THE OBJECTIVE

Aggregation for Investment

The MetaDex protocol is a trustable aggregator that reduces and potentially eliminates barriers to entry into the acquisition of metaverse-based assets (simply referred to as assets in the sequel).

Some assets generate a lot of interest, which increases their demand and subsequently results in very high asking prices. This, in turn, excludes a significant population of metaverse enthusiasts and interested buyers simply due to:

- ◆ lack of capital and
- ◆ the increased risk of singly holding a very highly valued volatile asset.

## METADDEX



The MetaDex protocol is specifically designed to aggregate purchasing power. It does that by pooling funding from the protocol's participants to constitute a DAO treasury that can compete for and acquire highly sought-after metaverse assets, including NFTs, analogous to an off-chain investment fund where numerous investors collectively build capital for investment.

The participants constituted of all governance token holders, suggest, deliberate, and vote on whether to acquire certain assets. As a result of the vote, the most trusted metaverse assets are acquired. This results in a diverse DAO treasury that has exposure to multiple metaverse projects.

Instead of a single purchaser of an asset raising capital and bearing all the risk for a volatile asset, the potential for loss is buffered because the DAO has multiple actors with varying amounts of funds in the protocol.



Taking the example of the Sandbox's metaverse, an NFT like a plot of land may be highly sought after, resulting in an unprecedented increase in its asking price. If an investor was to solely purchase this NFT, they would either have to raise and pay the entire amount required and consequently bear the risk of holding a volatile asset or not acquire this NFT altogether. MetaDex solves this conundrum by providing an infrastructure where participants can contribute small, varying amounts of money to build a treasury that collectively has enough to acquire numerous metaverse assets, even across multiple blockchains, leveraging the pooling of funds in its treasury.

# 2. | THE METADEX TOKEN AND TOKENOMICS

The METADEX token plays both the utility and governance roles. It is acquirable in either of the following 2 modes, depending on the phase of the project:

01

During the pre-sale, the protocol implements a novel mechanism that guarantees instant liquidity for its holders without relying on exchanges. This mechanism, known as the bonding curve offering, enables participants to exchange (bond) an ERC20 token, USDC, for METADEX at a price that is deterministically set by a mathematical formula. We elaborate more on the bonding curve in Section 2.A below.

02

After the pre-sale, the protocol transitions from using the bonding curve as the liquidity provider to a METADEX-USDC liquidity pool on Uniswap.

The decision to split the token acquisition process is informed by the need to establish token liquidity at a sustainable and predictable rate that balances demand and supply during the period following the protocol's launch. This way, MetaDex takes advantage of positives like deterministic token minting and pricing, derivable from the bonding curve liquidity provision mechanism.



# 2.A | TOKEN BONDING CURVE OFFERINGS

A bonding curve offering is an automated market maker that implements a mathematical formula in a smart contract geared to trigger the minting and/or burning of tokens while deterministically adjusting the token's price. The core concept of a bonding curve is quite simple: the price of a token is determined by its supply. The more a token is in demand, the higher the price gets.

MetaDex follows the precedence set by Simon de la Rouviere as follows:

01

With USDC, the protocol's chosen collateral, a user can buy METADEX through the protocol's bonding curve smart contract. The USDC is kept as a deposit within the smart contract.

02

The buy price is determined by the current supply of METADEX. The relationship between the buy price and the current token supply is hard coded in an immutable mathematical function and is visualizable in a graphical curve.

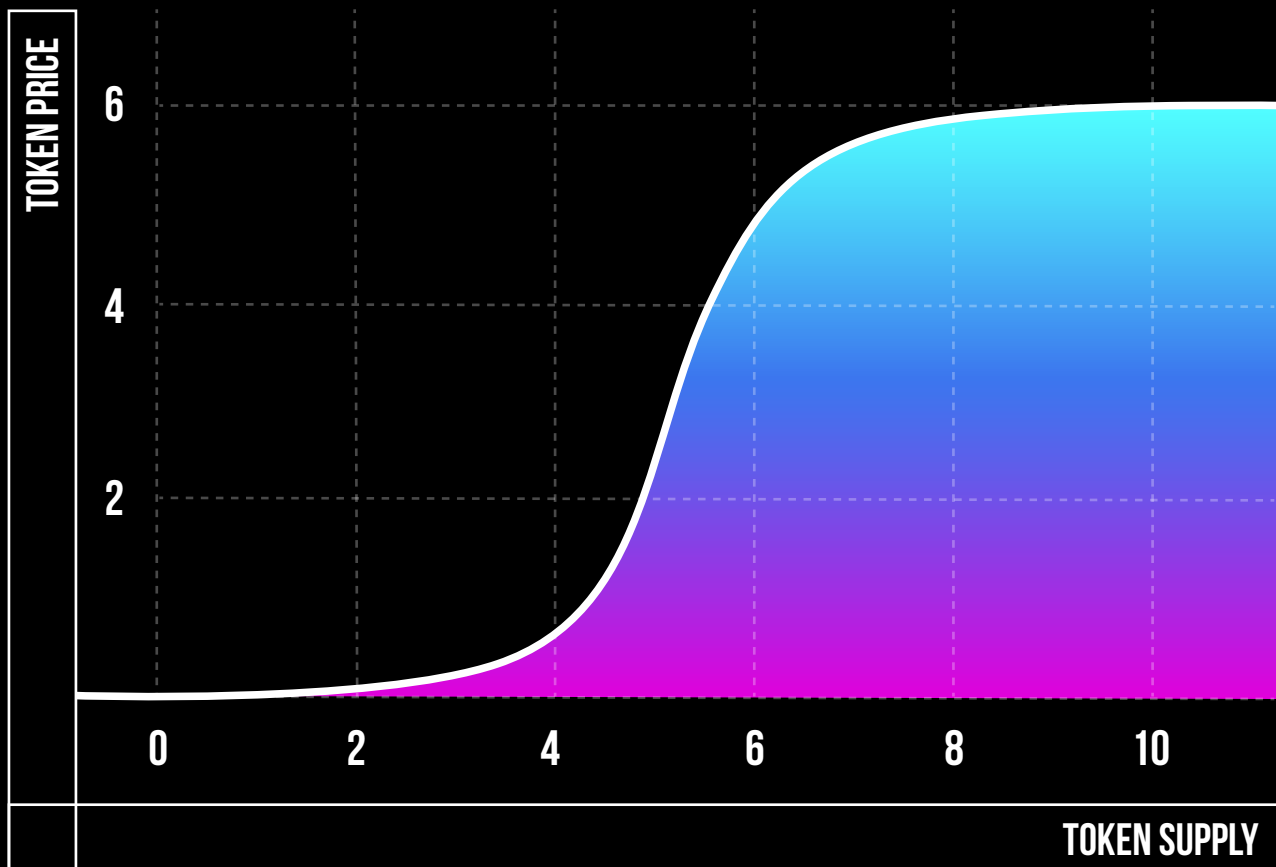
03

A token holder can redeem USDC by selling back their METADEX tokens into the bonding curve smart contract in exchange for USDC. The relationship between the amount of USDC redeemed in exchange for an amount of METADEX is also hardcoded into the same mathematical function that defines the buying price.

For the many advantages they offer, the protocol implements a sigmoid-shaped bonding curve because it rewards early bonders with lower prices but protects eventual bonders from inflated buying prices during the mature stages of the protocol.

This model allows new METADEX tokens to be minted when the demand increases and burnt when users redeem their USDC by sending back their METADEX tokens to the protocol's smart contract while maintaining the immutable price-supply relationship.

In this case, METADEX is a continuous token with an adaptive supply but a cap on the maximum supply of 1 billion tokens.



**Figure 1:** A sigmoid-shaped bonding curve showing the price on the y-axis against the token supply on the x-axis





# 2.B | TOKEN FLOW

To acquire (bond) METADEX tokens during the pre-sale, a participant sends USDC to the bonding curve smart contract. This USDC amount is to be used as liquidity and is held in the same contract.

Before the bonding operation, 5% is deducted as protocol fees. These fees are divided into two, 2% being the DAO's wallet allocation that covers the protocol's expenses like development and marketing, while 3% is sent to the protocol's treasury. Conversely, during the redeeming operation, 5% is deducted from the total redeemed amount and allocated to the treasury and DAO wallet in similar denominations.

A new amount of METADEX tokens is minted based on the current price as elaborated in Section 2.A. The newly minted METADEX tokens are used to create a vesting schedule for the bonder. The vesting schedule has the following periods:

**10%**

is immediately available for release by the bonder,

**25%**

is available for release 6 months after the bonding operation, and

**65%**

is available for release 12 months after the bonding operation.

These tokens earn interest at 10% APR during the vesting period. If a bonder chooses not to release the vested tokens even after their respective vesting periods end, they continue earning the said interest. Tokens do not earn interest when released from a vesting schedule and are effectively considered liquid. Vesting is further discussed in Section 2.C.



During the Initial Token Bonding Curve Offering (IBCO), liquid tokens can be redeemed as described in Section 2.A. In this case, a redeeming fee is charged and shared between the DAO treasury and the DAO wallet.



# 2.C

## VESTING VESTING VESTING

The protocol implements a vesting schedule for all bonders during the IBCO to mitigate price manipulation and other associable vulnerabilities inherent in a protocol implementing a bonding curve during the initialization phase. As an example, and as referred to in Figure 2, let's say an early bonder acquires their first token at a price well lower than 1. When newer entrants enter the protocol bond, the increase in demand increases METADEX's price and supply. If allowed, the first bonder may opt to redeem all their collateral tokens (sending METADEX back to the bonding curve to receive USDC), a direct contradiction to the entire purpose of the IBCO, that is, to dispense the token. This phenomenon may also cause unpredictable changes in price and supply, a scenario the protocol intends to mitigate during the IBCO.

In addition to acquiring METADEX tokens at a low price, all vested tokens after a bond operation earn an interest of 10% APR until a vesting period in the schedule ends, and a bonder chooses to release the vested tokens.



# METADEX

# 2.D | IBCO TO LIQUIDITY POOL TRANSITION

Through the bonding curve, the protocol establishes instant token liquidity while incentivizing early investment due to low token prices. Two classic challenges prevalent at the launch of crypto projects are solved: an imperfect price discovery mechanism/arbitrary token pricing and the lack of liquidity.

Once the project is launched, and enough tokens have been minted, the protocol transitions from the bonding curve to the open market for the following reasons:

- 01 To remove the price restriction imposed by the bonding curve as described in Section 2.A. This is particularly important because as the value of the protocol's treasury increases, the demand for the METADEX token will likely increase. With METADEX having a limited maximum supply, the rise in demand should reflect on the token price.
- 02 To allow interested parties, including the protocol itself, to become liquidity providers.
- 03 Lower the gas fees charged for the acquisition of METADEX. For every bonding operation, the bonding curve smart contract calculates the price of tokens to be minted in relation to the current circulating supply. This calculation imposes gas fee overheads that are not charged when swapping tokens in liquidity pools.
- 04 To further the exposure of the token to unaware investors because a listing on exchanges increases the protocol's visibility.
- 05 Ease the acquisition process of METADEX for interested DeFi protocols and individual investors.



The bonding curve smart contract defines conditions considered sufficient to trigger an automatic transition to a liquidity pool. One of the conditions is when the predetermined maximum number of METADEX tokens is minted during the IBCO.

The bonding curve smart contract can trigger the minting of a maximum of 2% of the total METADEX token supply. If this amount is minted, the transition is triggered.

Alternatively, suppose this maximum number of tokens mintable by the bonding curve is not reached after 150 days. In that case, the protocol will check whether a minimum threshold of 5 million METADEX tokens has been minted. If so, the transition is triggered.



During the transition, a new amount of METADEX tokens is minted and paired up with all the collateral in the bonding curve smart contract to have a METADEX-USDC liquidity pool on Uniswap.

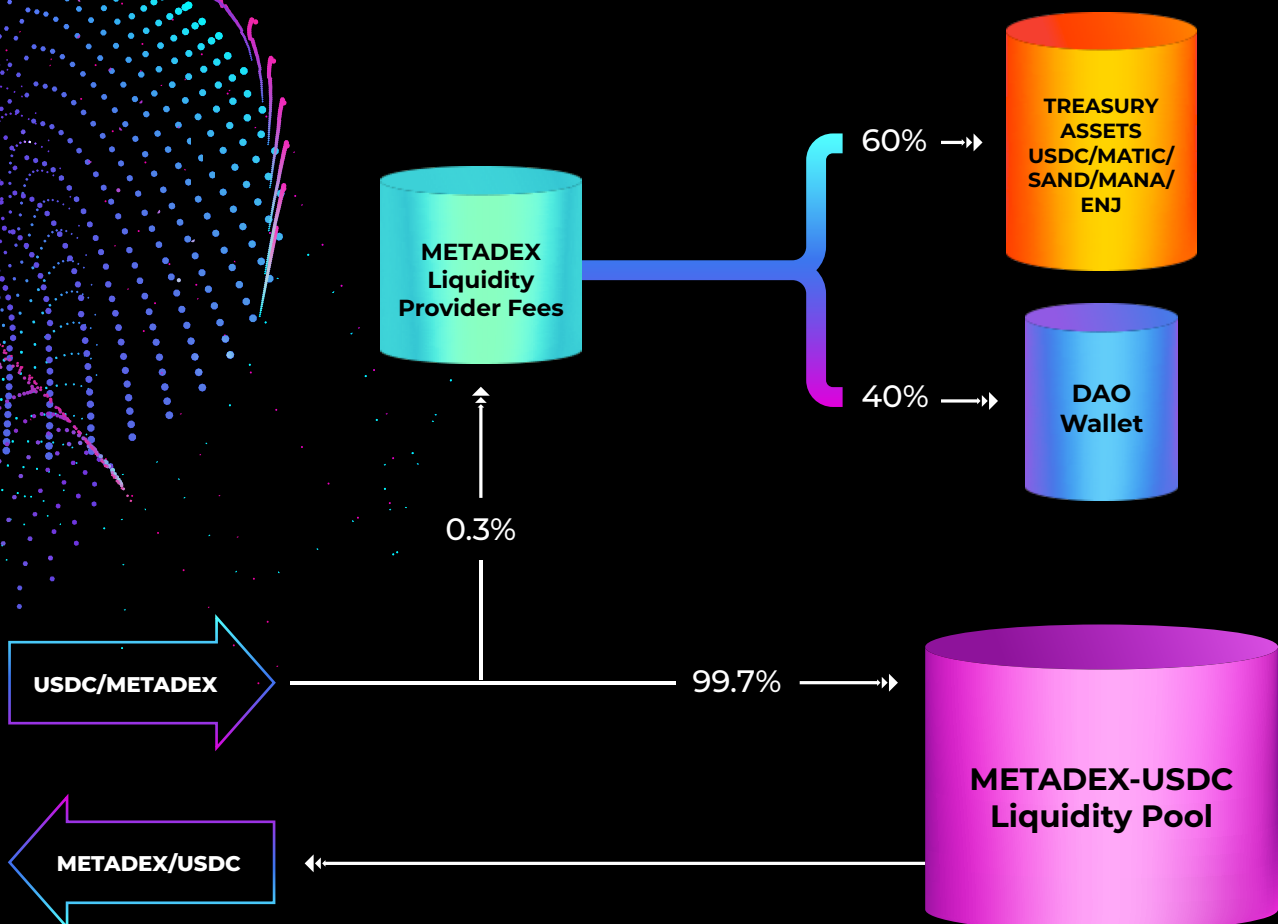


UNISWAP

# 2.E | THE LIQUIDITY POOL

MetaDex will initially be the sole liquidity provider to the newly created METADEX-USDC liquidity pool on Uniswap. During this period, the protocol will hold Liquidity Pool (LP) tokens representing 100% of the liquidity in this pool. For every swap on this liquidity pool, a 0.3% liquidity provider's fee is charged and added to MetaDex's pool. Eventually, other parties may add the METADEX-USDC pair to the liquidity pool, and the 0.3% liquidity provider fees are split proportionally to the contribution of all liquidity providers.

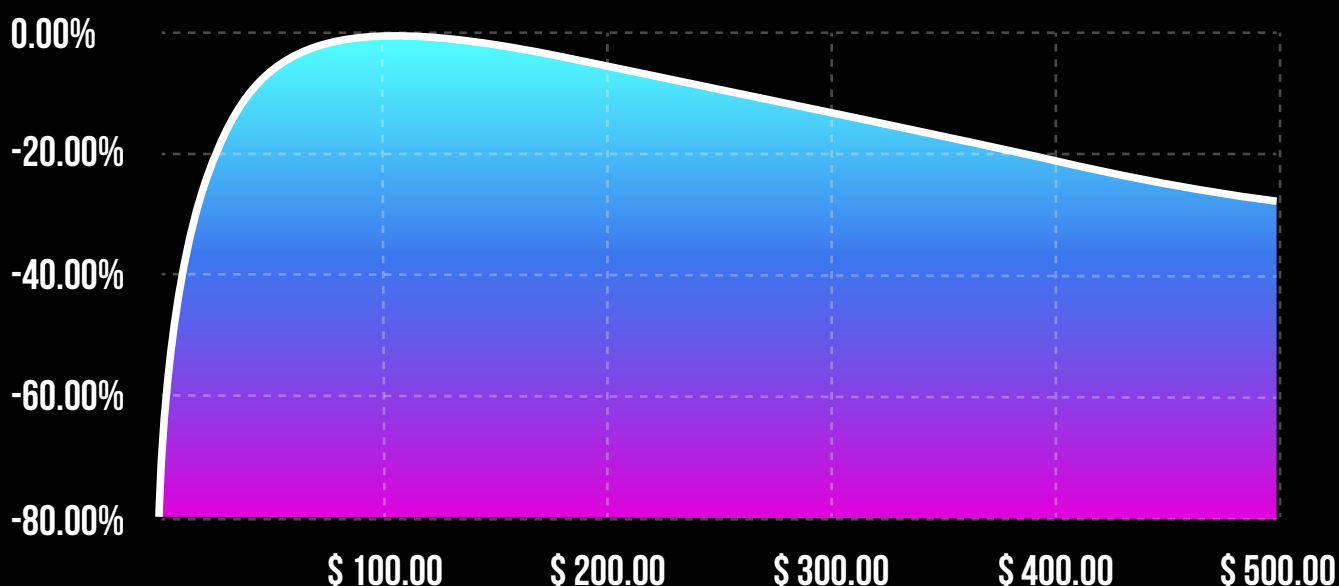
**Figure 3:** Token flow in a liquidity pool



Over time, the quoted METADEX price in the liquidity pool may diverge from prices quoted on the broader market. This phenomenon creates an arbitrage opportunity and guarantees METADEX trades to happen on the Uniswap liquidity pool. This is because arbitrageurs will take advantage of the price difference between markets by placing successive buy/sell orders and capitalizing on the difference in prices. From MetaDex's perspective, more trades result in more liquidity provider fees and ensure that the token's price aligns with its broader market valuation.

Such changes in the price of the METADEX token, as described above, can result in an impermanent loss. An impermanent loss happens when the prices of assets in a liquidity pool change from when they were deposited, resulting in a lower dollar value at the withdrawal time. More importantly, a liquidity provider is exposed to impermanent loss regardless of the direction of price movement of the tokens in the liquidity pool. Quite simply, an impermanent loss is the price ratio of assets in the pool relative to the time of deposit. A bigger change in price results in higher exposure to an impermanent loss. There is no risk of impermanent loss if assets remain at the same price or return to the price they had at the time of deposit.

**Figure 4:** A graph showing price changes against the changes in total liquidity value



Even though liquidity provider fees counteract the impact of an impermanent loss, they may not be enough to cover the entire value caused by significant changes in price. Notably, an impermanent loss is only realized when assets are withdrawn from the liquidity pool, at which point the loss becomes permanent.

Since MetaDex's liquidity pool pair is METADEX-USDC, the risk of impermanent loss is mitigated because USDC is a stablecoin. Stablecoins are less exposed to impermanent losses because of relatively small price movements.



## 2.F | TOKEN DEMAND AND SUPPLY MANAGEMENT

METADEX's supply is capped to 1 billion tokens for economic and governance reasons. Currencies with limitless supplies are prone to inflation despite any mitigatory procedures. Furthermore, METADEX is the protocol's governance token that reflects a holder's vote weight on investment decisions. A limitless supply jeopardizes the predictability of voter weight for a token.

## 2.G | EMISSION PLAN

MetaDex employs a gradual and sustainable token emission tailored to introduce the token into the market at a rate that meets its demand while maintaining a sustainable price movement. The process is kickstarted during the IBCO phase, where tokens are only minted when there is demand.

After the IBCO, the protocol transitions from the bonding curve model to a Uniswap METADEX-USDC pool. With the IBCO phase only allowed to mint a maximum of 2% of the total METADEX token supply, 98% will be minted and released according to the following principles:

**50%**

for bonding, as discussed in Section 4.A, geared towards growing the treasury,

**33%**

for rewards and incentives under partnerships established with other projects,

**10%**

reserved for active community members who actively participate in well-meaning investment proposals, active governance, and incentivized campaigns like treasure hunts,

**5%**

METADEX tokens are reserved for rewarding the team and genesis investors.

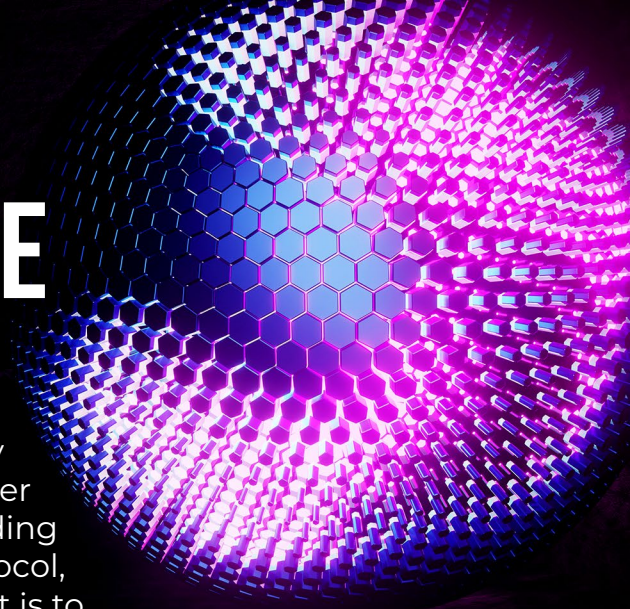


## 2.H | **PROTOCOL MECHANICS**

In general, the protocol does everything it can to maintain or push the price of its token. This includes investigating new functionality that increases the utility of the token (please refer to chapter 5) and thus organically growing the market for Metadex itself.

As the utility of the token increases, it will attract new users who can now benefit from these new functions. As we are still very early in the development of both Metadex and the Metaverse itself, we are confident that—just as many use cases for the Metaverse have yet to be fully explored—the same is true for Metadex. A fact, we believe, gives the protocol room to mature and adapt. As these use cases continue to reveal themselves, the more the organic market will develop around the token.

# 3. | GOVERNANCE



MetaDex is a permissionless protocol whose utility token is also its governance token. Any token holder can contribute to the protocol's governance, deciding on adjusting fees, adopting new rules for the protocol, and more. While fully recognizing that the easier it is to contribute to the protocol's governance and the easier it can be to reap the benefits of the protocol's aggregatory treasury, there needs to be an abundance of caution about the powers and privileges bestowed upon the METADEX token holders in the governance context. Since the protocol's primary purpose is to build a diverse treasury that potentially gains value exponentially with time, the governance structure must be provably robust such that the cost of acquiring voting power and executing a governance attack always outweighs the total value gained by an adversary in the event of a 'successful' attack. This means that a malicious actor within the protocol always loses more than they can gain by a successful governance attack. The protocol defines this as a necessary and sufficient definition of a provably secure governance protocol and plans on progressively innovating governance models tailored to its specific application.

Given a choice between diminishing the growth of the treasury so that the cost of a successful attack is always more than what is gained by a successful one versus limiting the extent to which governance token holders can impact the protocol, MetaDex chooses the latter.

MetaDex employs a combination of the ERC20-balance-of-voting strategy and the quadratic voting system on Snapshot, which considers not only the number of METADEX tokens held in a voting account but also the total number of voters. Concretely, the number of individual voters matters more than the voting power.

In a quadratic voting system, the power of an account holding a considerably larger balance, more significant than all other token holders combined, is easily outvoted by the numerous smaller holders. This protects the protocol's treasury from a skewed representation of opinion on its investment decisions.

Additionally, in a quadratic system, voters may express their degrees of approval or disapproval on an option by spreading the voting power across any number of choices. For example, in a proposal on whether to acquire assets A, B, and/or C, some users may prefer only A. Others may choose B, while some may choose a combination of A and B or A and C, and so on. In a quadratic vote, it is possible to express approval in ratios of listed options, such that you may, for example, allocate 70% of your voting power to option A and 15% to both B and C. This way, the result of the vote carries all participants' voting power in the proportions they allocate.



# 3.A | THE GOVERNANCE PROCESS

MetaDex's governance process follows the following outline:

01  
02  
03  
04  
05  
06

A proposal is suggested

The community evaluates and potentially improves the proposal

The proposal is submitted for voting

The community votes to approve or reject the proposal

If approved, the proposal is implemented

The community evaluates and approves or rejects the implementation

# METAVVERSE

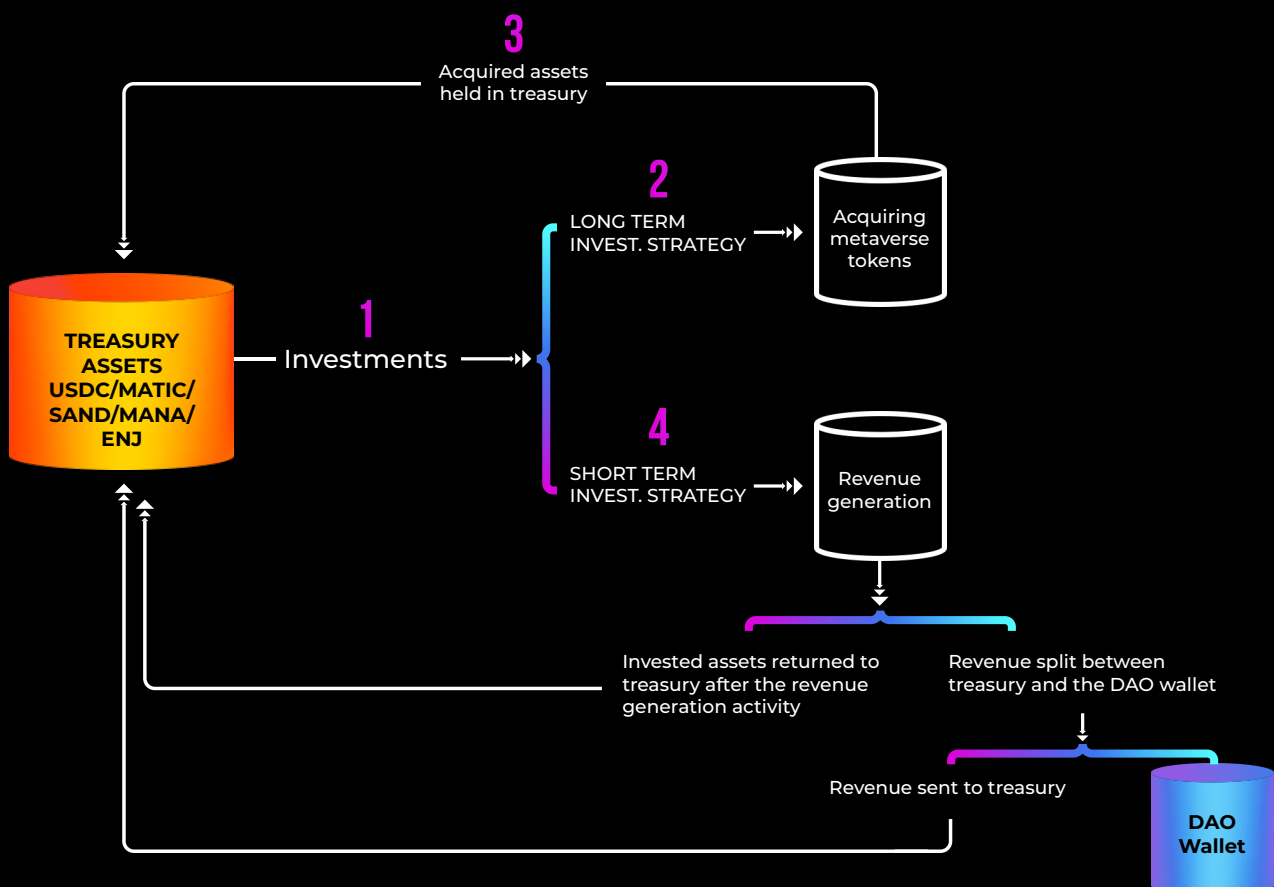
# 4. | INVESTING

Decisions on what assets to acquire, the amount of treasury funds to spend on the said assets, and the period for which these assets are to be held in the treasury are all arrived at by voting.

The DAO's investment decisions are geared towards incrementally growing the protocol's treasury. Assets acquired are to be held in the treasury for the long term to allow their associated projects to fulfill their upside potential, gain value and consequently increase the value of the treasury. Since these assets are to be kept in the treasury for the long term, they can be perceived as long-term investments and are the backbone of the treasury's growth.

The DAO may elect to indulge in additional revenue-generating activities like lending or staking some of the acquired assets and/or even acquiring assets for specific short-term revenue generation activities like participation in an external lottery. Such activities can be seen as short-term investments because they naturally take shorter periods to generate revenue.

**Figure 5:** A flow chart depicting the investment process



## 4.A | POST IBCO-BONDING

In the IBCO context, bonding is the acquisition of METADEX tokens by interacting with the protocol's smart contract through its DApp (Distributed Application). During the IBCO, the protocol's smart contract is the exclusive liquidity provider.

After the IBCO, one of the protocol's strategies to acquire assets for its treasury is by bonds. Bonds allow the investors to exchange their crypto assets for METADEX directly from the protocol. The protocol sets the amount/value of an asset it would like to add to the treasury and allows bonding only until this threshold is met.

Typically, the exchange rate quoted by the protocol is lower than that quoted in liquidity pools, allowing bonders to acquire METADEX at a discount and, at the same time, contribute to the growth of the protocol's treasury. The DAO decides when and how much of an asset to acquire and the bonding rate of METADEX to that asset.

## 5. | UTILITY AND DEVELOPMENT

### 5.A | EPHEMERAL AUTONOMOUS TREASURIES

Section 1 describes the objectives of the protocol, aggregation for investment. We extrapolate this idea by describing protocol-supported autonomous mini-treasuries ownable by METADEX token holders by contrasting with the protocol's architecture. To recap, all token holders own and govern the protocol's treasury. They make strategic investment decisions by voting on how to grow the protocol's treasury.



In the broader context, token holders do not directly populate the protocol's treasury with their own funds;

01

they interact with the bonding curve smart contract during the IBCO with the protocol charging a fee for bonding and redeeming operations.

02

After the IBCO, they may bond as described in Section 4.A (exchanging a predetermined asset for METADEX at a predefined price/ratio).

The above-described operations grow the protocol's treasury from protocol fees and bonds.

Admittedly, a group with aligned priorities may have investment interests that diverge from the protocol's interests. In this case, the protocol is building a trusted infrastructure (a trusted infrastructure may not necessarily mean trusting the protocol itself but trusting the protocol's implementation of the infrastructure) for trustless peers, allowing them to build short-term autonomous treasuries for which they send/pool together their personal crypto assets for their self-defined purpose. Such a treasury is only governed by the participants, and all strategic decisions are exclusively restricted to its participants. The MetaDex protocol, acting as a service provider, charges facilitator fees for creating and administering these autonomous treasuries. These fees are sent to the protocol's treasury - for which all token holders have governance rights and the DAO wallet.

## 5.B | DIVERSIFICATION

While MetaDex is initially deployed on the Polygon blockchain, the protocol anticipates multiple metaverse platforms on different blockchains to be developed in the foreseeable future. Accordingly, the protocol is actively researching emerging technologies and how it can efficiently create and develop cross-blockchain bridges to expose the participants to acquire metaverse assets from multiple blockchains.

# 5.C | STAKING

Irrefutably, Proof-of-Work-based blockchain consensus algorithms are increasingly being replaced by those implementing Proof-of-Stake consensus algorithms. In anticipation that MetaDex's treasury will hold multiple assets, including those that can be staked on various platforms, the technical definition of the procedure to stake the held assets and inherent consequences is an active area of research for MetaDex. Once complete, the development will commence, and the DAO will be able to stake assets from the DAO treasury should they elect to.

# METADDEX

