Mugen Finance: empowering multi-chain sustainable yield

Introduction

Demand for cross-chain is high, particularly so when speaking of DeFi because of another efficient and value-adding opportunity; Composability.

Composability in the space is a real innovation. It is enabled and further improved by cross-chain messaging solutions, which are able to create connections and interactions among chains and protocols.
These types of solution are also defined as L0s, and as the name says, they lay the foundation for several structures, or the previously mentioned composability.

One messaging protocol which arised this year and got viral, also for its big investors and VCs backing it, it's LayerZero. It allows the ''Realization of cross-chain applications with a low level communication primitive''.
Its primitive feature can be discerned through the simplicity of communication and relaying of messages among ecosystems.
In fact, by being a primal system, LayerZero isn't specialized, but rather it lets projects have this kind of opportunity.

Bridges and projects are able to have a solid basic base which, therefore, acts as a collaborative promoter for the first ones, whose underlying framework load them with several advantages:
- **United Liquidity** is pooled in applications across ecosystems, in a flowing way
- **Security and efficiency of operation:** LayerZero with the Ultra-light Node avoids single points of failure like middle-chains, but also reduces messaging costs between chains, so that a user will only pay gas on the source chain. Furthermore block headers are transmitted on-demand by decentralized oracles rather than being kept in sequential order
- **Chain-agnostic DeFi**
- **Interoperability across chains**

We think projects will soon develop several new mechanisms, systems and workflows through not only DeFi applications, but a variety of them.
In fact, since LayerZero has a generalized nature, it will allow for many other new use cases.
Interesting will be also to see how cross-chain micro and macro-economics are being structured and designed.

Now, LayerZero has firstly launched on EVM chains and since the development toward L2 solutions has been high this year (L2 22'), this is reflected in its operations.

In fact, as you can see from the dashboard below, the majority of transactions, from Ethereum (on Stargate), were directed to Arbitrum (8370 txs), whose ecosystem is representing a strong narrative in the DeFi world and since "The Merge" has finally happened, it will further benefit in terms of scalability.
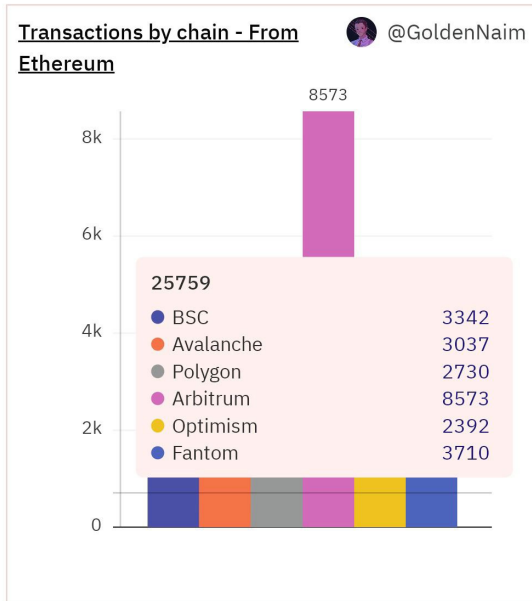
Transaction by Chain - From Ethereum - @GoldenNaim

In the Arbitrum ecosystem, among all the protocols, a specific one had a big consideration from users, and that is GMX.

GMX is a Spot and Perpetual DEX built on Avalanche and Arbitrum. It has proved to be a sustainable DeFi application, and precisely sustainability is a characteristic we will find later as a Mugen core value, and GMX is going to be a part of it.

Speaking of GMX, we can see it as a latest DeFi narrative representative; the #RealYield movement.

This hashtag which reached high sharing levels on Twitter, refers to those protocols which aim to provide long-term sustainability value to its holders and, as the name itself implies, Real Yield or not generated by unsustainable or inflated sources.

If until last year the DeFi space was treated like an on-chain casinó, lately this vision started to decline. The majority of users realized that the extraordinary rewards they were getting from their DeFi operativity were due to liquidity mining incentives and hyper-inflationary tokenomics design, and not from tangible and solid streams of revenue.

To put it simply, most of DeFi tokens had just one use case; being dumped.

In this dashboard we can see how DeFi Token Market Caps are dramatically and constantly decreasing since November '21.
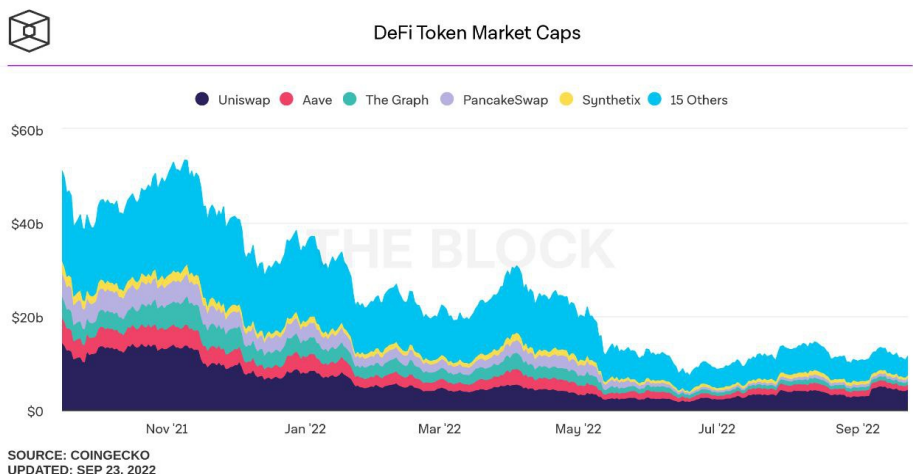
DeFi Token MarketCaps - TheBlock

Obviously, the bear market arrival also played a big role in spreading the narrative out, shifting the investors' attention to more sustainable and less risky options.

As we said, GMX is a good example on how to properly incentivize a token's holding without diluting the token value through inflationary policies.

To do so, the protocol designed a valuable product (a.k.a. their trading platform), capable of collecting substantial amounts of fees.
Those ones are then redistributed to stakers through a fees-redistribution model which favors $GMX's holding, leading to a win-win situation for both the investors and the protocol.
This way, the first can benefit from yield, while the second are able to drive more organic token demand, which translates into a less volatile price action.

Talking about redistribution models, another important feature to always look at is the token used for sharing out rewards. In $GMX case, the team decided to utilize $ETH for Arbitrum and $AVAX for Avalanche.
That's an interesting move, because by implementing different and more demanded tokens in the form of rewards, it's possible to absorb part of the demand for those tokens.
Also, because of this, the team is able to decouple the rewards value from the tokens price action, making them attractive assets to hold without necessarily increasing their supply, and therefore preserving scarcity.

Now that we've explained what #RealYields protocols are, let's introduce Strategy Protocols, developed along the lines of the first ones.

Strategy protocols aim to offer optimized and advantageous strategies by being exposed to Real Yields protocols (obviously, there could be more degen strategy protocols too), theoretically

reducing risks and increasing yields.

In this research we will analyze one of them: Mugen Finance

Mugen Finance

Mugen Finance can be defined as a multi-chain yield-aggregator protocol. It doesn't only aggregate yield like would be done by NFT aggregators such as Genie or Gem.
In fact these last ones only enhance user experience by proposing a richer and more organized user interface, which allows users to integrally explore an NFT ecosystem, all in one place, in exchange for a protocol fee.

Mugen instead aggregates yield by applying different strategies, from different chains, and providing yield to its investors through staking.
So that said we will categorize Mugen Finance in "Yield Aggregators", even though this definition should be adjusted by adding a sub-category highlighting its "Strategy Protocol" (Strategy-as-a-Service) nature.

Let's now give some context and comparison between Mugen and the specific market sector it belongs to.
Looking at the dashboards below it's possible to see how much Market Share Yield-Aggregators have in relation with the Total DeFi Value Locked.
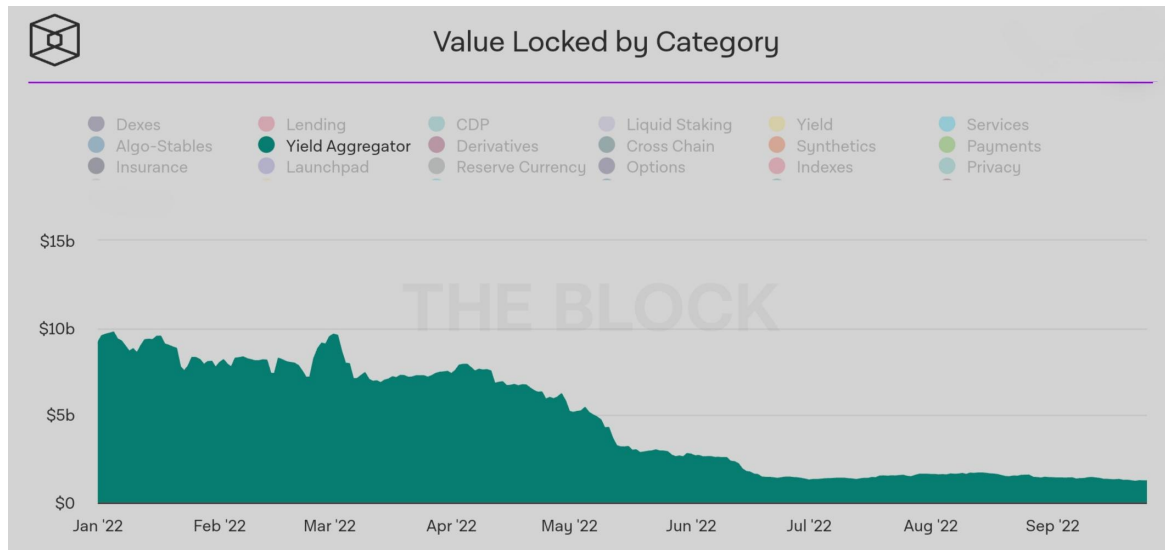

Total Value Locked by category in 2022 - TheBlock
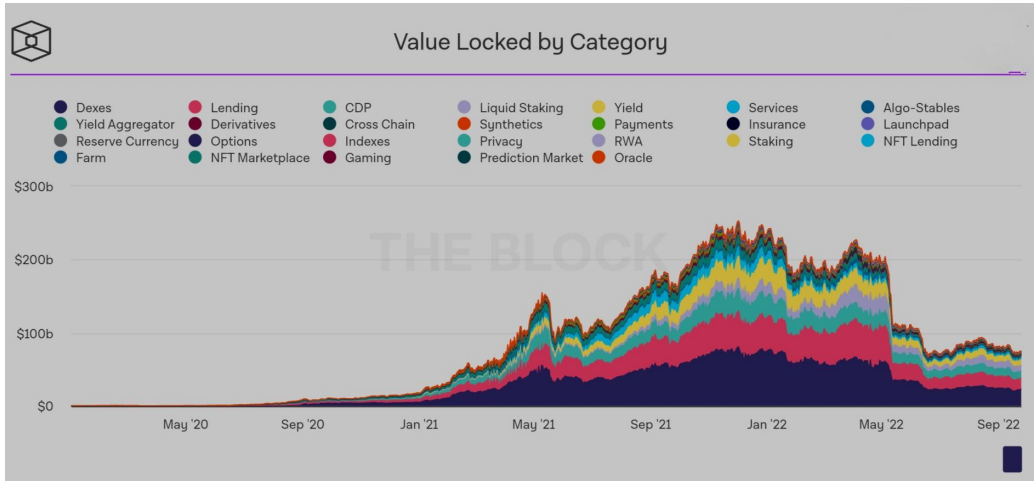
Total Value Locked by category in 2022 - Yield Aggregators - TheBlock

While the Total DeFi Value Locked in 2022 reached an ATH of $242b, Yield Aggregators had a peak of $9.75b, that is a 4.03% market share; there is definitely room for growth.

Now let's jump toward more specific market share comparison, or among yield aggregators projects vs. Mugen.
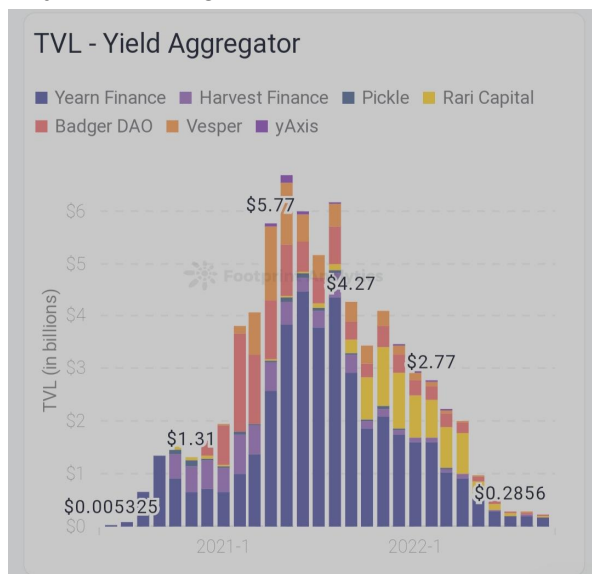
TVL Yield Aggregators - Footprint Analytics

Here we could see how the top 7 yield aggregators have amounted (High of 2022) for over $6b TVL, and so if we compare this data with the previous dashboards, these protocols make approximately 64% of total Yield Aggregators TVL.
From the Mugen side indeed, at the time writing, it has a TVL of $3.23m, so its market share amounts roughly to 0.035%.

It's important to note that in the case of Mugen Finance, the Total Value Locked does not represent the liquidity which is present in the platform.

Since Mugen Finance operates through a Treasury, it is also considerable as a yield-management protocol, therefore the TVL has to be thought of in a different way from usual.

Specifically it can be calculated as follows:
TVL = Mint Price * Supply
where
- Mint Price: Mugen Finance's token → $MGN can only be minted through depositing USDC into the treasury contract, and the mint price increases when mintings do the same
- $MGN supply

While the Protocol Architecture will be explained later in the research, now just keep in mind that users, in order to use the protocol, have to mint $MGN through depositing USDC (at least 50) in the treasury.
From there it becomes Protocol Owned Liquidity (POL), and willingly or not, the USDC deposited will move to the "Strategy Hub", where strategies find application.
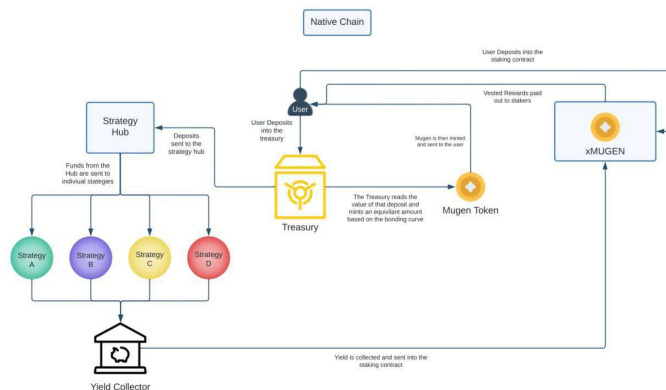
As a result, this is why TVL is determined as previously explained.

Furthermore the mechanism could also be considered as an incentive part of Mugen Tokenomics, because the minted $MGN are not finding any use case in holding (if not for Price Action), so once minted the focus shifts on staking.


Mugen Protocol
Mugen is a multi-chain yield aggregator natively built on Arbitrum and leveraging LayerZero protocol as a messaging infrastructure.

If it is a multi-chain yield aggregator, then why building on Arbitrum?
Arbitrum is an Ethereum Layer2 offering scalability solutions to the Ethereum Network. It is pushing hard on development, in fact its ecosystem is rapidly growing, embracing many new protocols like GMX.
Arbitrum is also playing well on its own development by having implemented the "Nitro" update and working on a future release of "Odyssey".
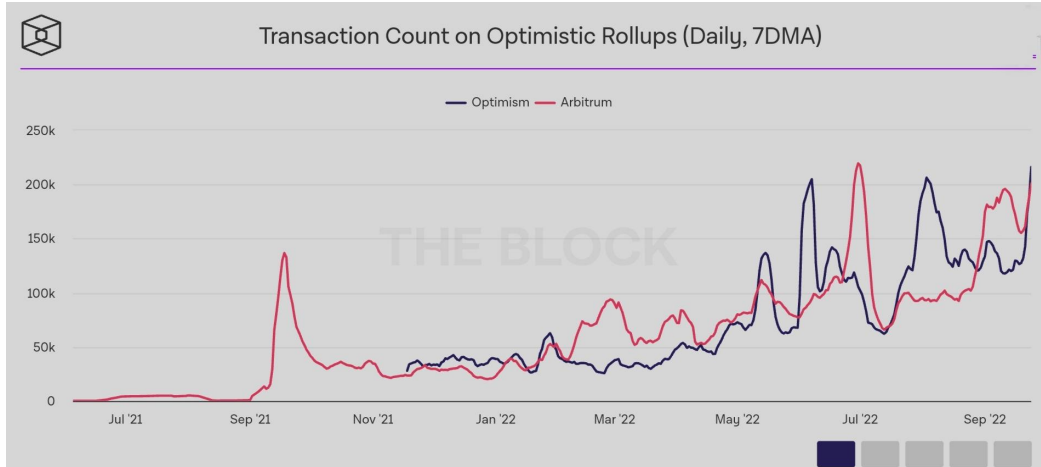
Transaction count on Optimistic Rollups in 2022 - TheBlock

As shown here, in fact, 2022 has seen and continues to see a constant growth in Optimistic Rollups (such as Arbitrum and Optimism) transaction count (Daily, 7DMA), all despite the bear market.

Finally two other adoption drivers are surely a token release, since Arbitrum received funds from many VCs, and the further scalability it is going to reach in the medium/long term thanks to Ethereum's shift to Proof-of-Stake.

So we could say Mugen is aiming, by launching on Arbitrum, to bootstrap its protocol and to receive more attention and demand. Also "Arbitrum is cheaper for calls, which will be implemented in the future, by like 100x" said a Mugen Finance developer.

Another important feature of Mugen Protocol resides in the embedding of LayerZero.
This messaging infrastructure primitive is primarily taken in advantage for facilitated cross-chain operativity and ease of strategy set-up.
So LayerZero allows Mugen Treasury to efficiently apply strategies on the target chains (only EVM-compatible chains at the time writing).

To summarize:
Mugen is benefitting from being a part of the Ethereum ecosystem (L2) and from LayerZero's integration, which makes it more efficient for cross-chain operations and strategies.

Now, let's explore the Protocol Architecture.

Protocol Architecture

We must admit, Mugen's peculiar architecture played a big part in making us decide to analyze the protocol. Its tokenomics also features some interesting mechanisms with a fair amount of game theory's implemented.

In order to fully comprehend how the protocol works and if there is potential for growth and scaling, it's critical to understand the dynamics between its core components.

Mugen Protocol is composed of 3 key elements cooperating with each other:
$MGN, xMGN and the Treasury.
We'll now proceed analyzing them jointly, focusing on the dynamics occurring among them.

$MGN

$MGN is the ERC-20 protocol token, built on top of LayerZero.

By taking advantage of LayerZero's infrastructure, $MGN is able to interact with all the EVM-compatible ecosystems, enabling the possibility to see additional future use cases for the token (e.g. being used as a collateral)

In fact, LayerZero is a flourishing ecosystem, with more and more projects adopting it over time. This represents an opportunity for Mugen to take part in its development, by creating partnerships which enable value for all the network participants.

The upcoming collaboration with Stargate Finance and Uniswap is a fitting example:
by implementing the "cross-chain swaps" feature into the Mugen app, Stargate and Uniswap collect more fees, while Mugen Finance guarantees a better UX for its user base.
Finally, the team has announced that "there should be other additional aspects that will enhance the utility", so maybe we can expect a possible involvement of $MGN in the service.

There are two ways of acquiring $MGN:
1. by depositing assets in the Treasury
2. by buying the tokens directly from the secondary market (like DEXes)

In the first case, users have to deposit certain assets (right now only USDC is accepted) into the Treasury to be able to mint $MGN tokens.
This is the only way to actually mint new tokens, and for each $MGN minted the mint price rises, following a negative exponential curve.

Price per token (in $) vs Current Supply of Tokens
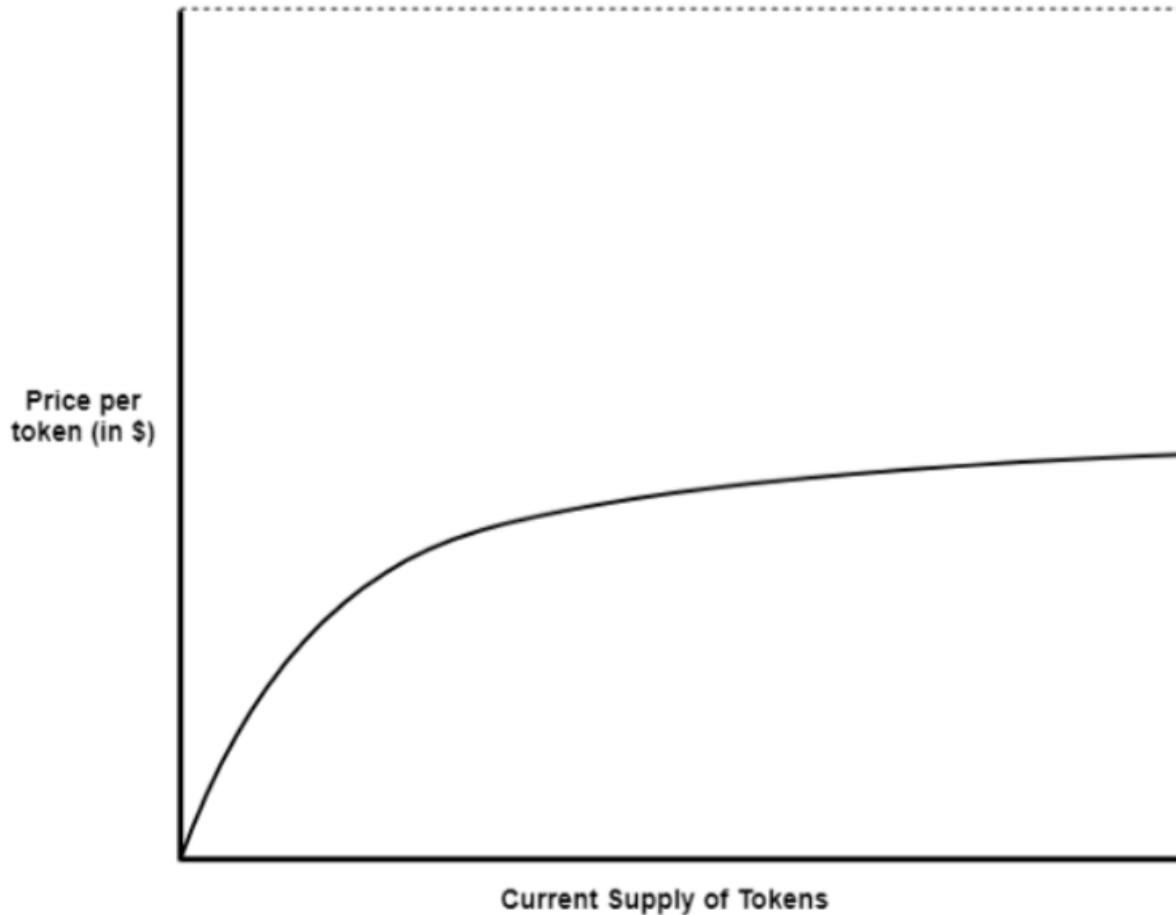
Negative exponential curve

This emission curve was chosen in order to reward early adopters without discouraging later investors.

In fact, as we can see from the function, early investors will be rewarded by the initial exponential price increase, while in the long term the curve tendency to flatten out will allow later investors to get involved in the project without facing prohibitive prices.

The mint price will keep rising as long as people keep minting $MGN by depositing assets through the Treasury. However, people won't do it if the market price is cheaper than the mint price.

This way, new $MGN tokens will be minted only when there is enough demand to drive the market price over the mint price, creating arbitrage opportunities.

Due to this mechanism, the token doesn't have a supply cap, since its offer is intended to be determined by the demand.

Mugen Finance launched with 0 tokens minted, since all the $MGN tokens that will ever be created are distributed to Treasury depositors.

The team itself cannot mint new tokens, and its revenue is mainly determined by the fees accrued from the protocol (we will cover that later in the research).

Token Distribution
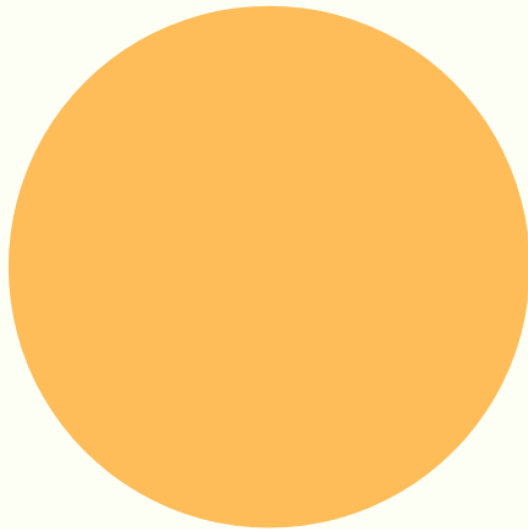
PROTOCOL USERS

All of the tokens every minted will go to individuals who deposit into the treasury

Depositors
100%

Earlier in the article, we mentioned the possibility of seeing arising arbitrage opportunities. As we said, if people want to enter the ecosystem they have two choices: minting new tokens or buying existing ones.

When **minting price > market price**, people will just buy $MGN on the secondary markets, creating buying pressure.

Assuming that most of the tokens will be staked (since it's basically the only existing use case at the moment), the token could become scarce. When we say "scarce", we are referring to the circulating supply, because if most of the tokens are staked then it becomes difficult to acquiring them on the secondary markets.

Let's imagine that, due to the buying pressure and the lack of availability, at a certain point **market price > minting price**.

Now, in that scenario it will be possible for users to mint new tokens and immediately sell them on the secondary markets for profit.

This arbitrage mechanism then creates selling pressure, which will drive down the market price, until the two prices are more or less equal and it will be no longer possible to take advantage of the price difference.

The market price therefore will probably always be lower than the mint price (because of the arbitrage). So if the market price of $MGN goes for instance to $1, then the risk for those who minted before that, is to potentially earn less (could have earned more) than those who bought at market price.

So in this case, inflation only occurs when there is demand for it.
When there is more demand for $MGN, it will be cheaper to mint than to buy at market.

Finally since compounding function (it will be introduced later in the research) would prevent any token downward swings (even though they would still be possible, if for instance, there is no demand for compounding), and potentially increase the token price above the mint price, then a new arbitrage opportunity will arise and that is going to continue the loop; so in a long-term good case scenario the mint price and the market price should roughly converge.

The problem will occur if there is no demand, and users do not compound rewards, so we would expect that normally the market price will always be lower than the mint price.

Now, we obviously don't know how the two prices will behave in the future, we just created some scenarios to help you understand the dynamic between the two $MGN prices.
We appreciated how the team was able to create a tokenomics in which, despite the lack of a supply cap on the token (which is usually something to be afraid of), the inflation kicks in only when there is enough demand for the asset to actually absorb that inflation.

xMGN

The second key element in the Mugen ecosystem is xMGN, the protocol staking token used to return the accrued yield to $MGN stakers.

xMGN is an ERC-4626 token, which is the optimized standard for yield-bearing vaults.

The interest-bearing token is minted every time a user enters the staking vault, with a 1:1 ratio to the staked $MGN.
When the same user leaves the staking vault, the xMGN tokens are burned and the original staked $MGN plus the generated rewards are then returned to him/her.

Since it's not possible to use $MGN to pay out the rewards due to its minting mechanism, the team chose to use $WETH for this purpose.

We could think of two main reasons behind this choice:

- ETH was launched prior to token standards creation. This means that it is not ERC-20 compliant, therefore for programmability reasons it's easier to use WETH to interface with Dapps.
  Also WETH improves interoperability between the same standardized tokens
- At the time of writing, the only available strategy it's the GMX/GLP one. Since WETH is one of the tokens GMX pays out rewards with, by directly using it to return yields to stakers, the team avoid additional swaps and therefore additional fees

There's no unstaking period, but the rewards are linearly vested for 30 days.
Linear vesting means that for each block created, a small part of the fees are unlocked.
However, although it's possible to unstake immediately, such an action would result in the loss of those rewards that have not yet completed the vesting period.
For example, ustanking after 15 days will lead the user only accruing the fees unlocked in the first 15 days, while the ones that are still vested are splitted between the other $MGN stakers.

Rewards are calculated based on the amount of xMGN owned.
An "x" quantity of xMGN possessed leads to a corresponding "y" quantity of rewards received.

Rewards Compounding

There is actually no auto-compounding function implemented in the staking vault contracts, but it's possible to compound manually. However, it's only possible to compound vested rewards.
Since it's not automatic, it requires users to manually give input on the amount of rewards willing to be restaked.
The compound function will swap $WETH for $MGN, and then stake them as xMGN.

A possible exploit within this mechanism could occur: one could immediately stake vested rewards and automatically receive $MGN, which would in turn be staked as xMGN.

Therefore, since unstaking is instantaneous, one would unstake (burning xMGN and receiving $MGN), and selling $MGN in the market, so as to avoid the 30-days vesting period.

This is precisely why Mugen has created a prevention system, since users could dodge the vesting period and immediately get rewards in the form of $MGN, then re-convertible into any ERC-20 token, and therefore create other risks such as staking manipulation (e.g. someone loaning a large amount of money, scooping all rewards and leaving in a day) or flashloans.

The prevention system consists in "vesting" the new (compounded) xMGN for the same amount of time as the rewards you have decided to compound, so you won't be able to burn them until the original vesting period expires.

Governance

Mugen's decentralized governance has still to be officially announced, but let's try and see some possible directions it could follow + how it could be structured.
Since Mugen being a Strategy Protocol, Governance could be triggered in proposals determining what strategy and in which chain applying that.

As just said Governance hasn't been formally presented yet, even though there are already some active proposals consultable through the discord Governance Forum chat and through https://snapshot.org/#/mugengovernance.eth

Specifically there is one proposal on Mugen's Snapshot.org page, proposing to add Cap Finance and Rage into Mugen for Trade Strategies.

Add Cap Finance and Rage Trade strategies

Active · Mugen Finance

by mugengovernance.eth

Both Cap Finance and Rage Trade allow for Mugen Finance to diversify its yield sources. This proposal is to set up and vote on the parameters of integrating these strategies into Mugen Finance.

Cap Finance is a zero fee perpetual exchange that allows for users to access trading in a decentralized manner. Its strategy would consist of providing liquidity into their USDC pool.

https://docs.cap.finance/

At the time writing there are 5 votes deciding on "Yes on Both", also we could see how $MGN seems to be the governance token. We at ChainEye think xMGN would better fit as a token.

In fact the adoption of xMGN as a governance token would enhance Mugen organization, for instance, more value would be attributed to active network participants like stakers.

Furthermore, if the token was to be $MGN, then this means a person should always have some free $MGN tokens in the wallet, and as a consequence that person would miss an earning opportunity, since $MGN is not a yield-bearing token (and you are not earning anything just by holding the asset) while xMGN is, and it gives the access to strategy rewards.

Therefore we could say that $MGN would disincentivize staking, conversely xMGN would further incentivize it (duration and disincentive to unstake), providing as a result, all the benefits deriving from staking we mentioned before.

Another strength of xMGN would be Bribes. In fact, since Mugen is a multi-chain strategy protocol, then other protocols offering yield would likely obtain more liquidity from Mugen (similar situation of Curve), so this way bribes could result as another driver for Mugen adoption scaling. Obviously since xMGN is not available in the market, Mugen, or another protocol (see Curve-Convex), should make it transferable across wallets, and so involving it in a sort of purpose-specific market in order for bribes to have an execution infrastructure.

The Mugen wars would be oriented at acquiring many xMGN in order to direct the Mugen-Treasury liquidity into Mugen Wars "winners" protocols, leading so to further "collaboration".

We could also expect some collaborations with protocols having LayerZero integrated or within that ecosystem.

That said, a little tidbit about the relationship between xMGN and strategies.

Strategies are likely to be perpetual because otherwise, in relation to what just said, if the protocol decided to terminate a strategy and a possible snapshot granting "x" voting power were to occur after the strategy termination, then a user would be left with unstaked funds ($MGN) and no voting power would be attributed to him/her.

Therefore, it is likely that any termination of a strategy would occur through Governance proposals, and therefore a termination date would be announced accordingly. In which, if funds were to be left in staking despite the strategy termination, they would be automatically unstaked.

Closing Thoughts

Let's close the circle up with some final thoughts on Mugen Finance.
It as a protocol, had our attention, a project building on Arbitrum and taking advantage of LayerZero has demonstrated some interesting points and features.

As previously mentioned, we at ChainEye found some curious systems and mechanisms in Mugen tokenomics and surely it has some well-structured parts.
However we also had the impression of a project that, while more organized and structured in some parts (concerning token risks, economics and "action" schemes), it lacks them in others (e.g. strategies).
As a consequence of this, in an industry requiring high-pace at making decisions, adjusting and developing on the run, could increase the error margin.

Now let's continue with a simple question;
Are Mugen services and products worth the 10% protocol fee?

To answer this, we'll focus on the only available (atm) strategy for stakers: the GMX one.
The strategy consists of using treasury assets to mint and stake $GLP and then redistributing the rewards obtained to the stakers (the 10% protocol fee is actually deducted from the generated yield).

Basically, it's just a dollar cost averaging strategy (DCA) into $GLP, based on the thesis that the underlying protocol (GMX) will keep growing. We won't question the asset choice, but rather examine the strategy's structure.

Now, everybody can apply DCA to mediate the price of a chosen asset over time, so in our opinion it doesn't justify the 10% fee. It's better to have a direct exposure to $GLP rather than having it through Mugen, since you're eliminating the risks of being exposed to an additional token/risk-layer.
That's because in this case it doesn't add any value, neither from a simplification point of view nor from a performance one.
To make it worth the 10% fee, we would expect strategies which are actually difficult to be implemented for the average yield farmer, which we think should be the protocol target user.

As a Strategy Protocol, Mugen should accomplish at least one of the following things:
1. Making more complex strategies accessible to inexpert yield farmers, such as Delta-Neutral strategies or Hedging strategies
2. Providing a higher opportunity/cost to stakers

To achieve that, we are proposing Mugen some suggestions:
- Traders grants: one proposal for Treasury could be to "hire" and attract DeFi advisors/investing firms with tested and proven strategies.
  Since highly-skilled yield farmers are very rare and they don't need Mugen in any case, it is would be better to involve people who have the specific know-how and experience
- Providing some sequential additional services. For instance, a Composability service for rewards with AAVE:
  Mugen could integrate some sort of strategy with AAVE within Mugen Application, so as to allow more capital efficiency to WETH-paid rewards

Ultimately, we will keep an eye on Mugen's development and progress, aware of the fact that what we analyzed today it's only the protocol "embryonic stage" and that there's a big room for growth and improvement.
Since we're not big fans of yield aggregators tokens, at the current conditions we're not considering to have an exposure on Mugen Finance.
However, we recognize that the team has potential, and we think that introducing further improvements in the protocol would make it a more interesting asset.