

# xDeFi : Stack of Decentralized Finance Protocols

2020.8.20 @Eric(eric@xdefi.com), @TTurbulence(tturbulence@xdefi.com)

## 0. AMM(Automated Market Making) Manifesto

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- AMM has everything you want. AMM is the only you need.
- AMM is the source of oracles, sink of lending services, farming field of arbitragers.
- AMM is the tool for liquidity providers, portfolio managers, and option underwriters.
- AMM belongs to all users, who believe in permissionless, trustless and self-organizing mechanisms.

## 1. xDeFi Introduction

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### 1.1 A brief history of AMM DEXes and other DeFi projects

From the end of 2019, Ethereum community nurtured a large batch of outstanding automatic market-making decentralized exchanges ( i.e. AMM DEX ) which emerged in a +300% CAGR ( according to data from [DeFiPulse](#) ). Till the time of this article be written, multiple successful AMM DEX products find its own position of Ethereum's history:

- [Uniswap V1/V2](#): Initiated from Nov 2nd, 2018. Although developed later than earlier pioneers like Bancor Network or 0x on-chain orderbook trading system, Uniswap has easier exchange curves to understand, lower gas to trade, won great amount of users and new projects' IEO (initial exchange offering) in Jul-Aug 2020. Uniswap V1 only supported exchange pairs between Ethereum and any other token, but in Uniswap V2, trading derivative token like DAI against any other token became possible, which greatly enhanced the liquidity power of Uniswap systems.
- [Kyber Network](#): Initiated from 2017. Compared to binary pools (Ethereum + any other token) Compared to Uniswap's fixed binary pools of 50%-50% proportion, Kyber introduced multiple assets at non-fixed proportion in 2019. It can provide about 4 times of liquidity efficiency\* over Uniswap V1 and 1.5 times over Uniswap V2.
- [Balancer](#): Beta version online at the end of 2019, and incentivized farming initiated from Jun.1. 2020. Balancer's pool management is dexterous enough for a wide variety of

DeFi user groups, including fund managers, risk managers, liquidity providers and arbitrageurs. Low liquidity pools became YFI's most important infrastructure, while at the same time, high liquidity pools are themselves crypto-index. Balancer became one of most infrastructure in DeFi world, won 2nd highest DAU among many DEXes.

- [Curve.fi](#): Beta version online at the end of 2019, and incentivized farming initiated from Aug. 2020. Curve.Fi introduced a mixed constant-value market making function, compromising almost all main-stream stable-coins and cross-chain Bitcoins, established a new standard for trading homogeneous tokens\*\*.
- [SushiSwap](#): A famous project which played an almost perfect cold-start, enabling Uniswap's LP token (Liquidity providing proof token) so that it can mine SushiToken, migrate huge amount of total value locked (in short, TVL. Sushi's TVL is over 1B at early September 2020, later migrated back due to tokenization of Uniswap). DAU and #tnxs of SushiSwap is about 10% of Uniswap V2, and TVL at 1/4 of Uniswap.
- [MCDex](#): Providing ETH perpetual short AMM, a sophisticated but useful tool for Ethereum miners who have graphic cards.

\*: Liquidity Efficiency: Defined as

$$\text{Liquidity Efficiency} := \text{Trading Volume} / \text{Total Value Locked}$$

\*\* : Homogeneous tokens share the same underlying assets.

These AMM DEXes are extremely precious data examples, since they achieved more than 6 billion USD TVL in their on-chain trading systems. At the same time, in Ethereum community and even in similar ecosystems like Tron and Polkadot, many DeFi projects, with different product forms, with greater DAO mechanisms, with better tokenomics, and with better fairness are rapidly emerging. Projects like [MakerDAO](#), [AAVE\(lend\)](#), [Compound](#), [Synthetix](#) and [YFI](#) attend this Cambrian of DeFi in many forms, greatly helped the development of all AMM DEXes. The first time since the ICO mania in summer 2017, people feel the enthusiasm of creativity and species' diversity of Ethereum community.

The two founders of xDeFi are blockchain developers, Ethereum DeFi fans, Ethereum miners (with non-professional rigs). In their opinion, a fully developed DeFi ecosystem should start from well-established infrastructures. Many best practices are introduced in xDeFi ecosystem, including but restricted to: xDEX as one of optimized AMM DEXes, xHalfLife as a money stream protocol, xSTA as a stable coin minted from crypto assets, xBadge as an incentivizing approach based on social consensus, and any other DeFi building blocks which are essential for a well-ordered market.

xDeFi doesn't focus on different AMM curves or special optimization for any certain trading scenarios, but it proposed a full set of parameters which reward fairness and loyalty. Initial design by a small team fewer than 10 developers and a small group of community volunteers, xDEX is full ready to embrace DAO after community users had a fully understanding about what problem xDeFi is solving, which could enable xDEX Token with a

much more decentralized governance process.

xDEX farming pools introduced several templates to mine xDEX tokens, in most of them the proportions are fixed to squeeze the slippage, boost the liquidity efficiency to its theoretical limit, and also saving Ethereum mainnet gas fee. Farming Pools LP of xDEX, so-called XPTs, are enabled to farm xDEX tokens according to users' relative contribution after various adjustment and correction parameters if users stake their XDEX Pool Tokens, which unleash the maximized liquidity providing profitability directly to users in a much more fair way. Through market neutral repurchase introduced by [PlaceHolder](#), profits can be fairly distributed to users, rather than intermediate agencies.

xDEX also allow users to establish ordinary pools to satisfy their own demand. New token issuers, fund managers, risk managers rather than liquidity providers are free to establish any pools using any standard ERC-20 tokens without any permission.

In the future, xDEX provided templates for socialization of crypto-funds. Community economists will be invited to create crypto fund, and XPTs are easy to invest in just like ordinary ETFs. Community users can upvote or downvote farming pools to maximize their own return on xDEX tokens. xDeFi's founders, as experienced rustlang and Polkadot/Substrate developer and tokeneconomist, can also initiate proposals to migrate the series of xDeFi to other cross-chain protocols or mainnets like Polkadot, Cosmos or Near, on which user experience may benefit from newer features as long as EVM is supported. xDEX's DAO will show astonishing adaptability , versatility and inclusivity.

## 2. xDEX: Features and Advantages

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### 2.1 xDEX: Rethink Multi-Asset AMM

We shall first give thanks to outstanding products: UniSwap and Balancer.

Uniswap(V1/V2) implemented constant-product function AMM curve back in 2018:

$$V = X \cdot Y$$

to ensure the constant product of the amount of 2 tokens ( assets ) in a particular pool before or after any trading.

To add or remove liquidity,  $V$  will change together with pool's LP Token ( proof of liquidity providing ), and the amount of 2 tokens also scales proportionally:  $\delta X$  and  $\delta Y$  must conform to

$$\delta X/X = \delta Y/Y$$

This design provide infinite depth liquidity between these 2 tokens for each other, together

with price feeding:

$$Asset_1/Asset_2 = Y/X$$

which equals to

$$X \cdot Asset_1 = Y \cdot Asset_2$$

This formula inherently support a fact that the 2 tokens' ( assets' ) proportion in this portfolio ( pool ) are always kept at 50% : 50%, and the goals of "Pool as Oracle", "Pool as automatic shifted portfolio" are naturally achieved.

In UniSwap V1, one of the 2 assets must be Ethereum. Uniswap V2 removed this constraint.

In [Balancer's Whitepaper](#) , an expanded constant weighted multiproduct AMM curve is used:

$$V = \prod B_i^{W_i}$$

This expansion provided infinite depth of liquidity between any 2 tokens ( assets ) out of N tokens in the single pool, feeding arbitrary pairs with price :

$$Asset_i/Asset_j = \frac{\frac{W_i}{B_i}}{\frac{W_j}{B_j}}$$

which means

$$(B_1 \cdot Asset_1) : (B_2 \cdot Asset_2) : \dots : (B_n \cdot Asset_n) = W_1 : W_2 : \dots : W_n$$

This formula inherently support a fact that the N tokens' ( assets' ) proportion in this portfolio ( pool ) are always kept at  $W_1 : W_2 : \dots : W_n$ , and the goals of "Pool as Oracle", "Pool as automatic shifted multi-asset portfolio" are naturally achieved.

xDEX conforms to the basic design of Balancer. In practices, Balancer's typical usages varies between one each other, attracted many geeks to explore many possibilities. Right after its \$BAL tokenization, a bunch of 98% – 2% pools, which composed from extremely unbalanced components, were rapidly emerging. These pools, like many other pools, were established at their owners' wish to play some roles in different scenarios, but in fact most of them were not qualified to provide enough liquidity. On the opposite side, the components' proportion of pools in UniSwap V1/V2 ( and many other AMM DEXes forked from UniSwap ) are fixed at 50% : 50% , are extremely easy to use, but no any other choices on providing liquidity. UniSwap has 10 times more DAU than Balancer, but the assets backing any LP-token is usually much more volatile compared to Balancers' BPT, especially when Ethereum's price was under heavy price changes.

Taken the observations above, XDEX's founders design special templates for fixed-ratio

multi-asset farming pools.

One of the most important template ( quaternary pool)is defined as following:

If  $\mathfrak{X}$  is the token name of any asset of high liquidity, we define the portfolio in farming pool as

$$\mathfrak{X}:wETH:DAI:XDEX = 32\% : 32\% : 32\% : 4\%$$

Any farming pool is responsible for price feeding of 6 different trading pairs.

We still provide basic ternary farming pool:

$$wETH:DAI:XDEX = 48\% : 48\% : 4\%$$

and VOTINGPOWER ternary farming pool:

$$wETH:DAI:XDEX = 32\% : 32\% : 36\%$$

For users holding UniSwap's LP tokens, SushiSwap's SLPs, or Balancer's BPTs, we encouraged users to farm XDEX token, but in a discounted speed in certain stages. The discount ratio is discussed in Chapter 3.

We encourage users holding UniSwap's LP tokens, SushiSwap's SLPs, or Balancer's BPTs manually convert their portfolio into XDEX's farming pools. After adding liquidity and staking their XPTs, they can farm XDEX token in undiscounted speed. We don't force them to migrate their LP tokens to XPTs, since the portfolio might be slightly changed.

Only XLP of XDEXPOWER ternary farming pool  $XDEX:ETH:DAI$  can generate XDEXPOWER rights to vote, conforming to xVote protocol, which will be detailly discussed in Chapter 4.

We are ready to implement any best practices in AMM DEXes, including (but not restricted to ) the potential UniSwap V3.

## 2.2 xDEX: Rethink the Choice of Assets

To select suitable  $\mathfrak{X}$  for quaternary farming pools, XDEX has several basic standards:

- Products ready
- Projects made their income statement/dashboard publicly available
- Standard ERC-20 token
- Tokens in multiple markets of good liquidity

In the last year, XDEX's two founders researched by their own as well as bought reports to investigate more than 50 projects which already issued their ERC-20 tokens.

Newly issued tokens, after upvote proposal, can attend XDEX token farming according to the

farming pool template.

Non-standard ERC-20 tokens, tokens of unaudited projects and will be blacklisted in farming pools and in ordinary pools.

## 2.3 XDEX: Rethink the Choice of Components' Proportion in Portfolio

Ordinary pools conform to the same standard as Balancer, with minor parameters changed:

- Single asset proportion not lower than 5%
- Asset types no more than 8
- Some extra tutorials or templates are given.

For different scenarios, XDEX has multiple different portfolio templates:

- 95% : 5%: Low impermanent loss, for arbitrage only
- 32% : 32% : 32% : 4%: Any non-farming pool is welcomed to use this template to test liquidity efficiency. Low impermanent loss for Component 4, low volatility for the entire portfolio, and enough liquidity provided for trading between Components 1-3.
- 50% : 20% : 20% : 10%: For newly issued tokens, any non-farming pool is welcomed to use this template to suffice its financing demand.

## 2.4 xHalfLife Protocol: Exponentially Decaying Money Stream Protocol

xHalfLife Protocol has 4 parameters for execution: *NumStart*, *K*, *ratio* and *eps*. Under this protocol, users' reward are split to 2 parts:

Deferred Income and Earned Income.

Any new income enters Deferred Income account.

After *NumStart* ethereum mainnet block, each time the block number can be divided by *K*, and asset in Deferred Income balance is over *eps*,  $ratio \cdot \text{Deferred Income}$  in Deferred Income balance will be forwarded into Earned Income account.

When needed, any asset in Earned Income is free to withdraw.

50% of any single cashflow under xHalfLife is free to withdraw after

$$-K/\log_2(1 - ratio) * 13.1s$$

since time at Ethereum Mainnet Block Height *numStart*

For more detail, refer to yellowpaper of xHalfLife and xVote.

For xDEX token farmed from XDEX voting pool, ordinary farming pools, and founder teams' fund, any income is rewarded through xHalfLife protocol. We wish the template of money stream can become one of backbone standard in crypto financing world.

xHalfLife is inspired by Sablier Protocol.

## 3. xDEX Token Distribution Among Farming Pools: A Fair and Incentivating Design

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### 3.1 Distribution Fairness

#### 3.1.1 Fee Designs: Self-Assessed Trading Fee

User select fee rate to establish non-farming pools among:

[0.1%, 0.25%, 1%, 2.5%, 10%]

- Trading fee for farming pools : 0.25%
- Non-Farming pools: Selected by their owners
- 0.25% part goes into SAFU fund.
  - 0.2% for XDEX repurchase and make strategy
  - 0.05% for referer (if referer not null)
- Warning: Exit fee for Voting pools: 1%

Self-Assessed Fee Rate is inspire by [Radical Markets: Uprooting Capitalism and Democracy for a Just Society](#)

#### 3.1.2 Fair Distribution Among Farming Pools: directFactor

$$\text{directFactor} = \text{tokenFactor} \cdot \text{liqFactor} \cdot \text{capFactor}$$

##### 3.1.2.1 tokenFactor

- Voting Pool:  $5 * (\text{Issued Tokens} - \text{Voting Pool Tokens} + 1) / \text{Voting Pool Tokens}$
- Ordinary Farming Pool: 1
- Non-Farming Pool: 0

##### 3.1.2.3 capFactor and liqFactor

$$\text{capFactor} = \text{round}(1 + \log(\text{clip}(1000000/B_{ETH}, 1, 1000000), 10)), \text{ if } B_{ETH} \leq 1000000$$

$capFactor = 1$  if  $B_{ETH} > 1000000$

$liqFactor \approx clip(\sqrt{B_{ETH}/100}, 1, 100)$

- $B_{ETH} \in [316227.7, ) : capFactor = 1, liqFactor = 100$
- $B_{ETH} \in [31622.77, 316227.7) : capFactor = 2, liqFactor = 32$
- $B_{ETH} \in [3162.277, 31622.77) : capFactor = 3, liqFactor = 10$
- $B_{ETH} \in [316.2277, 3162.277) : capFactor = 4, liqFactor = 3.2$
- $B_{ETH} \in [0, 316.2277) : capFactor = 5, liqFactor = 1$

### 3.1.3 Fair Distribution Among Native/Outer Homogeneous Farming Pools

For any farming Pool

- Native XPT Staking: 1
- Uniswap/Sushi  $ETH/DAI$  LP/SLP Staking : 0.96
- Uniswap/Sushi  $\mathfrak{X}/ETH, \mathfrak{X}/DAI$  LP/SLP Staking: 0.48
- XDEX/Balancer binary unbalanced pool containing  $\mathfrak{X}$ :

$$\min(p_{\mathfrak{X}}/0.32, p_{ETH \text{ or } DAI}/0.32, 1) \cdot 0.48$$

- XDEX/Balancer ternary unbalanced pool containing  $\mathfrak{X}$ :

$$\min(p_{\mathfrak{X}}, p_{ETH}, p_{DAI}) \cdot 2.88$$

No migrating mechanism. Users must manually remove their LP/SLP/BPT liquidity, add liquidity to XDEX to get XPT, and stake XPT to earn XDEX token.

In different stages of distribution, XDEX support different outer pool LP tokens to farm xDEX tokens.

In all stages, xDEX support all inner pool XPT tokens to farm XDEX tokens.

## 3.2 xDEX Token Empowered For Users/Voters/Founders

$xDEX - ETH - DAI$  pools' deferred income has corresponding DAO voting power, which is detailly describe in Section 4.0 .

Voting farming pool's reward has an unlocking speed 2x faster than the founders.

Ordinary farming pools' reward has an unlocking speed 90x faster than the founders.

According to section 3.1.1, part of xDEX fee enters SAFU fund.

If xDEX system runs smoothly after certain stages of token distribution, according to best practices from [Placeholder](#), xDEX will perform "Repurchase and Make" strategy routinely to



find the possibly unbiased value of xDEX tokens as well as keep sufficient ETH and DAI capital reserves.

xDEX tends to repurchase xDEX token among multiple markets ( including Uniswap V2 and Balancer) to continuously add exposure to daily DEX users, investors.

If system is under problems or experiencing updates, multi-sig founders and teams and DAO have the rights ( and have the rights to propose ) to utilize SAFU for further hiring, improvements and capital reorganization. At the most extreme scenario, teams' voting pool XPT will be removed from liquidity without dumping: These free of use *ETH* and stable coins will be used to support further hiring, improvements and capital reorganization, corresponding *xDEX* token will be burnt.

### 3.3 xDEX Distribution Timetable

Basic Rules: Risk-aware, Loyalty-aware, Fairness-aware.

#### 3.3.0 Initial Distribution:

100 Million Tokens before 4 times of halving.

- 5% Liquidity Provided By Community
  - In Uniswap LP form and xDEX XPT form.
  - Responsible for code developing and audit.
  - community consensus
- 75% Early stage incentivatin for liquidity providers:
  - 38.4% Four stages of farming, 0% Seigniorage.
  - 36.6% TVL milestones for users.
- 10% Initial Team
  - Locked until 4 stages of farming finished. No pre-farming. Unlocking patterns conform to xHalfLife.
- 5% Introduce new founders. Locked until 4 stages of farming finished. Unlocking patterns conform to xHalfLife.
- 5% Multi-Sig locked, for DAO, community and marketing.

#### 3.3.1 Four stages of Early Bird Reward

Since the genesis block of xDEX token block # 0:

38400000 tokens will be distributed.

- 9600000 tokens for block # 1-40000, 240 each.

- 9600000 tokens for block # 40001-120000, 120 each.
- 9600000 tokens for block # 120001-280000, 60 each.
- 9600000 tokens for block # 280001-600000, 30 each.
- For block # after 600000, 10 tokens for each block.
- First year inflation:
  - 19.26% if all 6 TVL Milestones accomplished.
  - 28.5% if 4 TVL Milestones accomplished.
  - 30.37% if no TVL Milestones accomplished.
- The inflation rate drops every year.

### **3.3.2 xHalfLife Protocol To Incentivate Loyalty In User-First Manner**

- For founders: Block # after 600000, 0.1% tokens unlocked per 3600 block.
- For voting pool farmers: Block # after 0, 0.1% tokens unlocked per 1800 block.
- For ordinary farming pool farmers: Block # after 0, 0.1% tokens unlocked per 40 block.

### **3.3.3 High Liquidity First**

In the first early farming stages, ERC-20 tokens with high liquidity are automatically added to farming pools.

DAO will be responsible for new listed ERC-20 tokens.

### **3.3.4 Awards For TVL Milestones**

XDEX development team deeply hope founders can gather community users, DeFi fans, DAO fans and institute investors to achieve multiple TVL milestones.

At the end of each liquidity farming stage, if TVL reached 1M/10M/100M/1B/10B/100B for the first time, weighted awards will be airdropped to all farming users in xDEX. If some milestones are not met in the 4 early stages of farming, xDEX will airdrop xDEX token till milestones are met ASAP.

TVL Milestones incentives (in xDEX tokens 36,600,000):

- 1M USD: 300,000
- 10M USD: 300,000
- 100M USD: 900,000
- 1B USD: 2,700,000
- 10B USD: 8,100,000
- 100B USD: 24,300,000

## 4. xDAO Operation

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### 4.0 xDAO Voting Power

Original Power  $P = (\text{Founder's Power} + \text{Power in Voting Pool})$

Weighted Power  $P = P / (1 + \log(1.0 + P))$

Voting power is:

- Linearly farmed to reward loyalty
- Slowly dampened to keep prestige
- Mildly squeezed to resist voting bribery

### 4.1 Upvote and Downvote For ERC-20 tokens

xDEX welcomes any pools with any qualified ERC-20 tokens (standard ERC-20 of non-fraudulent projects) to be traded. In each 40000 blocks, xDAO collected ERC-20 candidates to be upvoted as farming pool tokens,  $\{ \mathfrak{X} \}$ . Effective voting power must exceed 1/3 in this voting, and original voting power must exceed 1/10 in all original voting power. At most 1 ERC-20 will be upvoted.

In each 80000 blocks, any existing ordinary farming pool may be proposed to be downvoted to be non-farming pool. xDAO collected ERC-20 candidates to be downvoted as non-farming pool tokens. Effective voting power must exceed 1/3 in this voting, and original voting power must exceed 1/10 in all original voting power. At most 2 ERC-20 will be downvoted.

### 4.2 xDEX Recommendation Incentives

xBadge system is under development.

### 4.3 Community Contributors' Reward

DAO has the right to propose and pass rewards for community contributors.

## 5. Risk Management

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### 5.1 Market Risk

For tokens in farming pools, xDEX hope liquidity providers fully understand various type of market risk: market price risk exposure, impermanent loss, volatility of XPT portfolio, and loss under extreme scenarios like market flashcrash.

xDEX hope liquidity providers fully understand the profit and loss during market making processes.

xDEX team and community volunteers will routinely give advices for token choosing.

## **5.2 Options In Extreme Scenarios**

xDeFi Ethereum option is under testing.

Beta version.

## **5.3 Stable Coin Crisis**

xDeFi defines xSTA as its native stable coin, to get rid the risk of:

- Any other stable coins unpegged from USD
- USD unpegged from 8 main-stream fiat

## **5.4 Extreme Market Volatility**

Some ERC-20 tokens with very low marketcap will suffer a heavy slippage, especially when market crashes. xDEX will warn users to notice those ERC-20 tokens.

## **5.5 FlashLoan Attacks**

In history, price attackers manipulates markets with low depth (specially for those with orderbooks), and make profit in AMM. In our experience, LP of AMM DEXes with also make profit under this situation.

## **5.6 Failure of Oracles**

ERC-20 with very low LP TVL may cause failure of oracles insider xDEX. Under extreme situation, we will refer to AMM DEXes (Uniswap, BAL, Kyber Network) to get price feeding first, and then LINK, BAND, NEST APIs to make sure the continuous and unbiased price feeding still being available.

## **5.7 Hacking events**

5% Initial Liquidity, and SAFU fund (right after xDEX start to make profit) is the defenses of xDEX from hacking events. xDEX will be audited at least once before online.

Each xDEX upgrade will cause additional audit.

Audit from several more authoritative audit service providers will be listed as soon as the

report is ready.

## 6. Project Roadmap

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2020Q4

- Basic Features: Ordinary and Farming pools
- At least 3 round of code auditing
- Initiated several stages of LP farming
- Community established
- DAO's voting for new  $\mathfrak{X}$  : *wETH* : *DAI* : *XDEX* farming pools.

2021Q1

- Stable Coin open for minting
- More templates for  $\mathfrak{X}$  farming
- DAO mechanism

## 7. References

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- [Automated Market Making](#)
- [Radical Markets: Uprooting Capitalism and Democracy for a Just Society](#)
- [Uniswap V1 Doc](#)
- [Uniswap V2 Doc](#)
- [Balancer Whitepaper](#)
- [KyberSwap Doc](#)
- [Synthetix Doc](#)
- [MCDex Whitepaper](#)
- [Sablier Protocol](#)