

2019

DeFi Industry Annual Research Report

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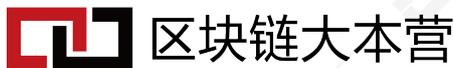


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EXECUTIVE SUMMARY

- ① **\$850 Million** Total value locked in DeFi (at least).
- ② **~ 50%** MakerDao Dominance, accounted for about 50% in the ETH DeFi ecosystem.
- ③ **Doubled** The total value locked (USD) in ETH DeFi more than doubled in 2019, from \$ 290 Million to \$680 Million, despite recent declines in the cryptocurrency price.
- ④ **10X** DAI stablecoin saw the strongest market demand with only \$3 Million locked in the DeFi protocol in the beginning of the year and grew exponentially to \$30 Million at the peak.
- ⑤ **\$154 Million** Debt outstanding in USD more than doubled from \$68 Million to \$154 Million at the peak.
- ⑥ **2.5%** ETH supply locked in DeFi accounted for roughly 2.5% of the current circulating supply.
- ⑦ **~ 7%** EOSs in circulation have been locked in the EOS DeFi ecosystem.
- ⑧ **Doubled growth** Lightning network saw a double growth in BTC value, from ~504 BTC to 1,100 BTC locked in the lightning network at the peak.
- ⑨ **\$6.3 Million/ \$600 Million** The growth of DEX trading activities has been relatively slow but steady in the past year, the daily average trading volume across 2019 is ~ \$6.3 Million compared to ~\$600 million on a top tier centralised exchange.
- ⑩ DeFi lending will continue its pace in 2020 but will start to focus more on the integration of value added components, such as Oracle, DAOs, etc.
- ⑪ With the integration of liquidity aggregator and market making bot, DEXs will grow in a much faster pace in 2020, however centralised exchanges will still dominate the market.
- ⑫ Stablecoins will continue to grow and connecting the cryptocurrency industry and traditional finance to bring a much wider adoption.
- ⑬ The DeFi industry will face some regulatory challenges, but proper DAO framework can help the DeFi projects to implement compliant governance model.
- ⑭ The industry should see an adoption of a pseudo-benchmark rate as the DeFi industry reference rate.
- ⑮ DeFi Financial instruments such as options, swaps will be created and gradually integrates with the existing DeFi infrastructure to help manage risks.

DEFI LANDSCAPE

Asset



Infrastructure



Stablecoin



DEX & DAO



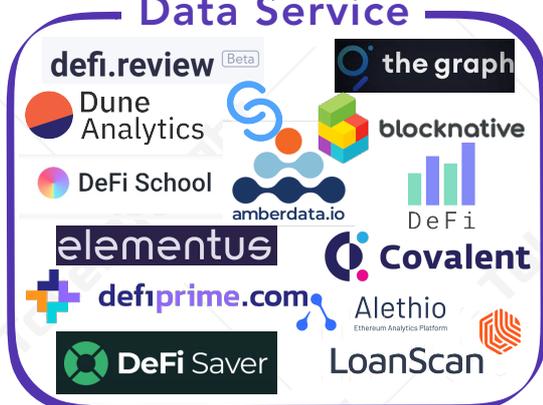
Staking



Lending & Payment



Data Service



Derivatives & Insurance



TIMELINE 2019

01

- Bitcoin-pegged ERC20 token Wrapped Bitcoin (WBTC) officially launched on Ethereum.
- Venture-backed startup Veil acquired Predictions.Global.

02

- Set Protocol announced the initial launch of Strategy Enabled Tokens on TokenSets.

03

- Smart contracts platform UMA, in collaboration with MakerDAO, tokenized the S&P 500 on the Ethereum.
- Cred added BitGo as Custody Partner to ensure the security of customers' digital assets.
- Ethereum-based decentralized asset management protocol Melon released version 1.0.

04

- Dharma crypto lending platform officially went live.
- Open-sourced trading software developed by CoinAlpha- Hummingbot launched.
- Set Protocol announced the initial launch of Strategy Enabled Tokens on TokenSets.

05

- Binance DEX launched LBA trading pair and reached DeFi financial services cooperation with Cred.

06

- Wanchain and a Fintech company Superatom launched DFP decentralized financial agreement.
- The second round bonus of PoolTogether's Ethereum-based "no-loss lottery" reached 123 DAI.

07

- Crypto asset management protocol Betoken was launched, and can manage more than 70 assets on the Ethereum ecosystem.
- InstaDApp officially launched an integration of MakerDAO, Compound, etc. to help users get the best lending rates.
- Centrifuge launched DeFi-infrastructure-based platform Tinline, enabling draw loans against tokenized real-world assets.

08

- WeiDex came out a new DeFi financing model Public Interest Project (PIP), aiming on reducing financing risk during seed round through on-chain governance.
- 0x launched the developer tool AssetSwapper, which can match the best price in DEX.

TIMELINE 2019

09

- Coinbase launched fund to invest in DeFi Protocol, depositing \$2 million USDC in Compound & dYdX.
- Chainlink released Mixicles enabling smart contracts to be private, while still being audible to regulators.

10

- dexFreight, MakerDAO, And Centrifuge completed pilot connected logistics industry With DeFi.
- Dharma launched new savings platform.
- Synthetix raised \$3.8 Million from framework ventures in the new funding.

11

- Maple Finance launched on mainnet and Rinkeyby testnet.
- MakerDao migrated its single DAI to multi-DAI.
- Nervos launched its mainnet and distributed token to the investors.

12

- Coinbase's visa debit card added support for DAI stablecoin.
- Zerion raised \$2 Million in seed from a group investors.
- TokenSets integrated cTokens, earning interests while the Set is positioned in the stable-asset.

01.

INTRODUCTION TO DECENTRALISED FINANCE-DEFI

1.1 What Is Decentralised Finance (DeFi)?

" The nature of the DeFi ecosystem is closely related to traditional finance with the addition of the Blockchain elements. DeFi is the combination of Blockchain technology, adding sprinkles of the elements from the traditional finance "

Decentralised finance (DeFi) is a group of financial products and services that build on top of a blockchain such as Ethereum which removes or reduces the reliance on central authorities. It is different from the way of the traditional financial market trying to leverage distributed ledger technology (i.e., Blockchain) to reduce costs and increase operational efficiency.

The DeFi concept took off in 2019 coordinated by an industry consortium working towards a decentralised future. Although the current DeFi ecosystem is still relatively small with 65K+ running sum of new users (by distinct address) on the network and the development or the live solutions predominately based on the Ethereum network. We have already seen an exponential growth in total value locked in the ecosystem, number of new users, number of projects developing in the DeFi ecosystem, we are expecting the trend should continue in 2020 to scale, integrate and innovate the sector.

One of the largest use-cases in the DeFi ecosystem in 2019 is lending, DEXs and prediction markets have seen slow but steady adoptions. DeFi products allow a trust-less solution (e.g. borrowing & lending) to be created, creating automated money markets where borrowers can gain access to the liquidity in the market and lenders in exchange can be reimbursed by the interest generated on their principle.

DeFi has its own universe, it could include but not limited to:

- Interest rate
- Tokenised Fiat, or stablecoins (e.g. Tokenised USD)
- Decentralised Inter-Protocol offered rate (DIPOR), LIBOR for open finance
- Derivatives such as interest rate swap, credit default swap
- Decentralised autonomous organisations
- Decentralised oracle
- Decentralised Exchanges
- Assets management and many more.

According to DeFi.Network, the core principles of DeFi include: a) Interoperability and Open Source. b) Accessibility and Financial Inclusion. c) Financial Transparency.

1.2 Open Finance, CeFi, DeFi and Staking as a Service

It is important to understand that there are a few similar terms that with different underlying natures but share similar attributes that may be integrated at some point in the future to form an enormous financial ecosystem, namely Open Finance, CeFi, DeFi and Staking as a Service.

Open Finance

Open Finance in the crypto community often been used interchangeably with DeFi, however, Open Finance can also point towards the unbundling of banking services by leveraging APIs and data to provide new generation of cutting edge, fully digital financial services with AML/KYC implemented in the lifecycle, similar to the term of Open Banking, but focusing on broader financial services.

Centralised Finance or CeFi

CeFi in the crypto community often refers to custodial, centralised products where a centralised organisation has control over the platform or product. The name is mainly derived from Centralised exchange and Decentralised exchange. Some examples are Binance Lending, BlockFi, Celsius, Nexo.

Decentralised Finance or DeFi

DeFi often refers to non-custodial products where the financial products or services are built on a permission-less blockchain solution such as Ethereum. Some examples are MakerDao, Synthetix, 0x.

Staking as a Service (SaaS)

Proof of Stake projects presents exciting opportunities in the cryptocurrency space. At a high level, Staking as a Service is any service made available to users on-demand via an organisation's (i.e., cryptocurrency exchange) blockchain node to participate in the PoS-based protocol network. It allows participants to participate in the governance of a network via the organisation's service as opposed to individually set up the blockchain node to participate in these activities. Some examples are Binance Staking, Stake.Fish, etc.

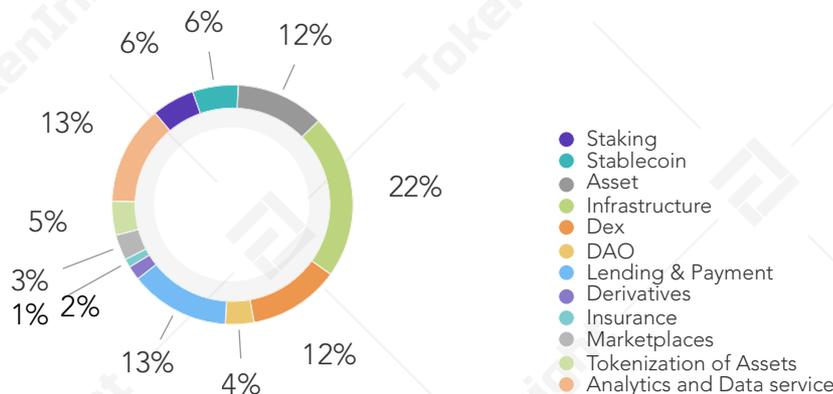
02.

THE CURRENT DEFI ECOSYSTEM

The current DeFi ecosystem consists of multiple categories of which 22% is working on the infrastructure layer, forming the foundation of the DeFi ecosystem. Lending and Data Service are accounted for 13% respectively of the total DeFi projects followed by assets (e.g. Stablecoins) and decentralized exchanges. **In total, more than 250 projects are working to create and bring the DeFi concept to the general public.**

DeFi Project Distributions

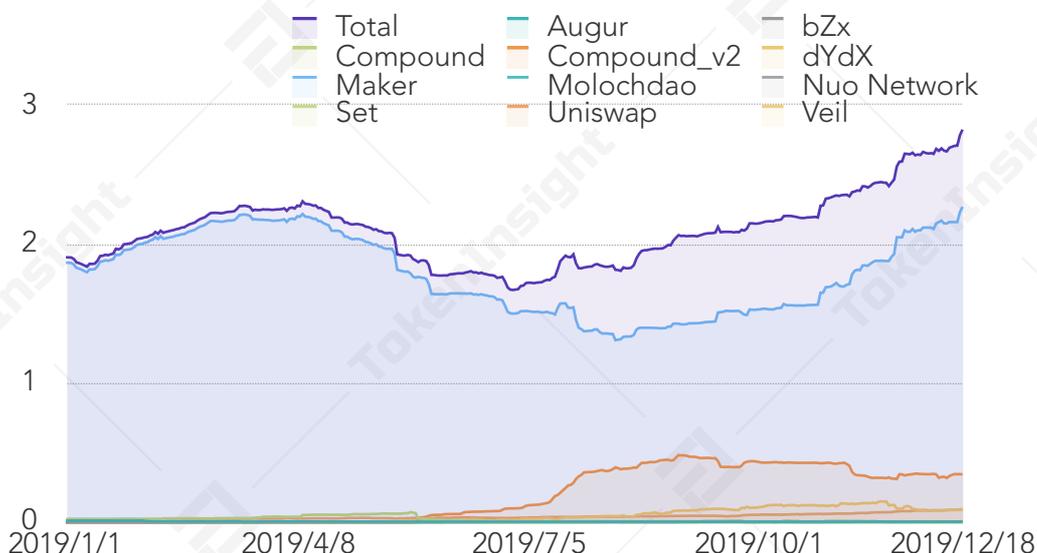
Source: DeFiPrime, TokenInsight



MakerDao is the leading lending project in the space followed by Synthetix and Compound, oracle such as Chainlink has integrated with the top lending projects to bring off-chain data to the DeFi lending space to further create values.

Total Value (ETH) locked in DeFi (in Million \$)

Source: Alethio DeFiPulse, TokenInsight



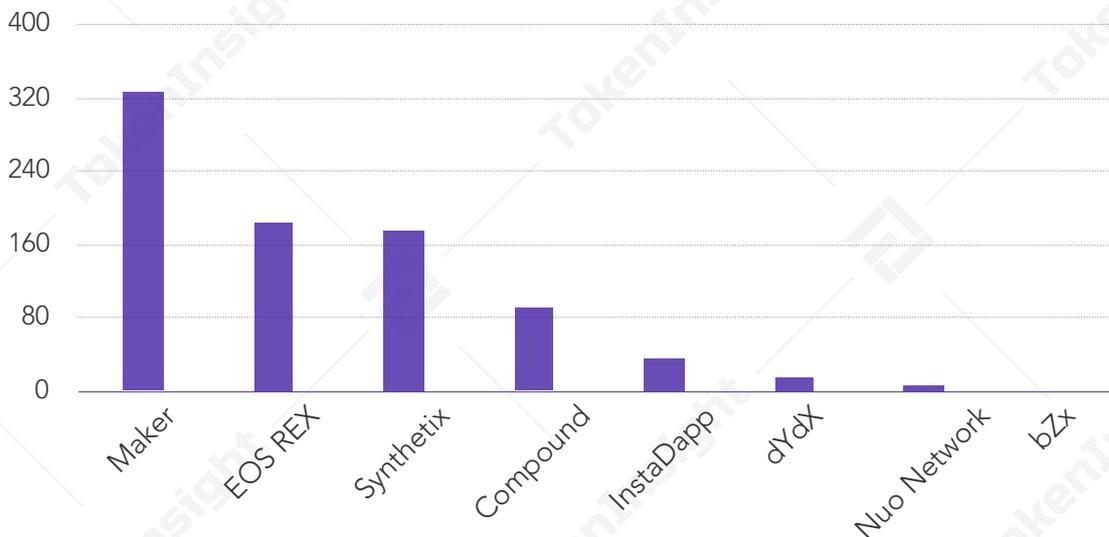
2.1 DeFi Lending

“ There are a few types of DeFi lending ecosystem by blockchain, Ethereum, EOS, and Bitcoin are the top three, in which Ethereum DeFi lending ecosystem is the most popular defined by total value locked (TVL) in USD

DeFi lending is different compared to the traditional lending in a way that DeFi is trustless, transparent and open source. Today, lending is the leading DeFi use-case with its total value locked more than \$850 Million of which more than 76% is based on Ethereum.

▸ Total Value Locked (USD) in DeFi Lending (Million \$)

Source: DeFi Pulse, DAppTotal, TokenInsight



2.1.1 Ethereum

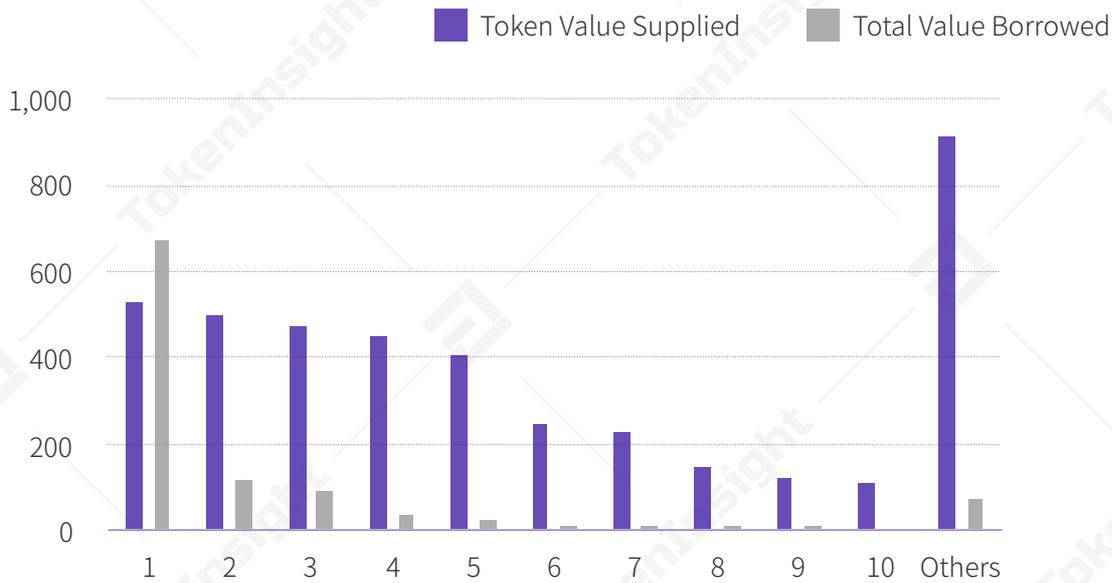
“ The DeFi lending space is heavily focused on the Ethereum ecosystem in 2019, Maker is accounted for 75% of the users in the ETH DeFi ecosystem

Compound creates properly functioning money markets for Ethereum assets with algorithmically derived interest rates. The interest rate is based on the supply and demand for the assets when demand grows, the interest rates increase. Being the 3rd largest lending project in the Ethereum DeFi lending ecosystem. **Compound is accounted for 51% of the remaining 25%.**

Dharma is a stablecoin savings account, offering fixed interest rates on the Compound protocol. The Dharma Version 2 taps into Compound’s liquidity pool enabling “instant matching”. **There are roughly \$1.6 Million TVL in the Dharma platform after its revamped debt market launched in the second half 2019.**

► Compound Top 10 Suppliers & Borrower (thousand \$)

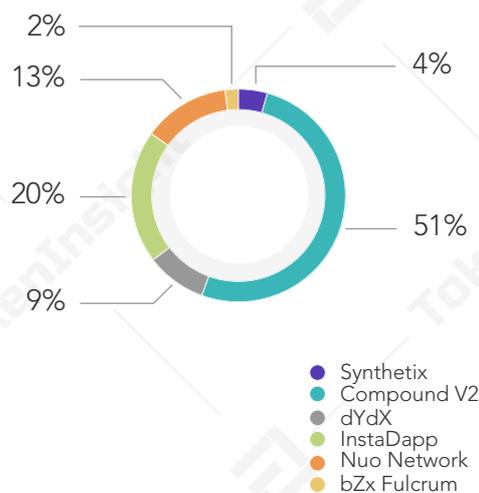
Source: Aleth.io, TokenInsight



dYdX is a protocol for lending, borrowing and decentralized margin trading (includes short sell and leveraged long). dYdX was based on the hybrid approach pioneered by 0x, this allows market makers to sign and transmit orders off-chain platform, with on-chain settlement. Lenders can easily earn passive income by depositing funds to dYdX, with automatic and dynamic interest rates. dYdX started off with only \$200K TVL in the beginning of the year, reached all time of nearly \$32 Million in TVL, hovering around \$13.5 Million in December 2019.

► DeFi Users Breakdown (Excl. Maker)

Source: Aleth.io



bZx Protocol is a decentralized margin trading and funding protocol where they have built Fulcrum and Torque, a margin lending & trading platform and an indefinite-term loan borrowing platform with fixed interest rates, launched in mid and late 2019 respectively. The protocol reached \$3.7 Million in TVL during December 2019. **It is still relatively small in the ecosystem and only accounted for 2% of the DeFi users.**

2.1.2 Lightning Network, EOS, BTC

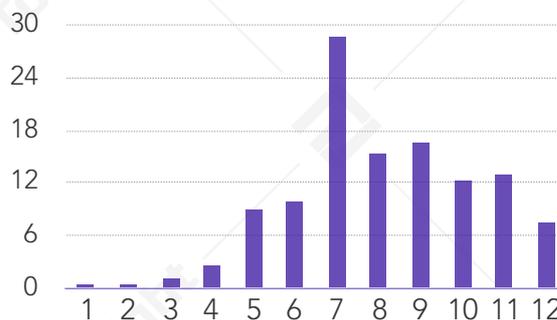
" The growth of lending solutions in non-Ethereum ecosystem is steady, with EOSREX, WBTC launching on EOS and BTC respectively, and Lightning Network's capacity growing to 1K+ BTC at the peak

EOSREX is an interface to the EOS Mainnet's "REX" smart contract where users can: Lend EOS to earn a share of the pool's income; borrow CPU & NET resources for 30 days at current rates. The leasing process involves two kinds of tokens, EOS token and REX token. **The project reached an all time high total value locked in of \$733 Million, and currently hovering around \$200 Million in TVL and is the top DeFi project on the EOS blockchain.**

Wrapped Bitcoin (WBTC) is the first ERC20 token backed 1:1 by bitcoin. WBTC standardizes Bitcoin to the ERC20 format, thus DApps can leverage Bitcoin for decentralized lending, margin trading and derivative markets. Without the WBTC, BTC holders need to go through an intermediary to convert Bitcoin to ETH first. **WBTC has reached nearly 600 BTC in TVL by the end of 2019, and reached nearly \$30 million in transaction volume at the peak.**

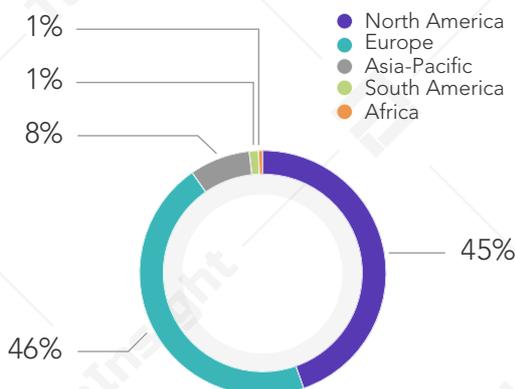
WBTC Monthly Transaction Volume(million \$)

Source: Dune Analytics



Identifiable Lightning Network Nodes Geographical Distribution

Source: 1ML



Lightning network as the Bitcoin's 2nd layer protocol saw a significant growth in 2018. **In less than 2 years' time, Lightning grew to 10K+ nodes with 6K+ active channels and a network capacity of 1k+ BTC at the peak.** It also becomes more distributed and gaining adoption in the industry where Bitfinex is the first major exchanges to offer lightning network support with instant withdrawal and deposit. It also opens the door for exchange users to shop with Bitcoin over Lightning network on Bitrefill to purchase gift cards, mobile refills etc.

Money on Chain provides a bitcoin-collateralised stablecoin, bringing DeFi to the Bitcoin Network leveraging the RSK sidechain. With a growing interest in DeFi, we are about to discover the Lightning Network's position in DeFi and the whether we could see a vibrant Bitcoin DeFi ecosystem in the future.

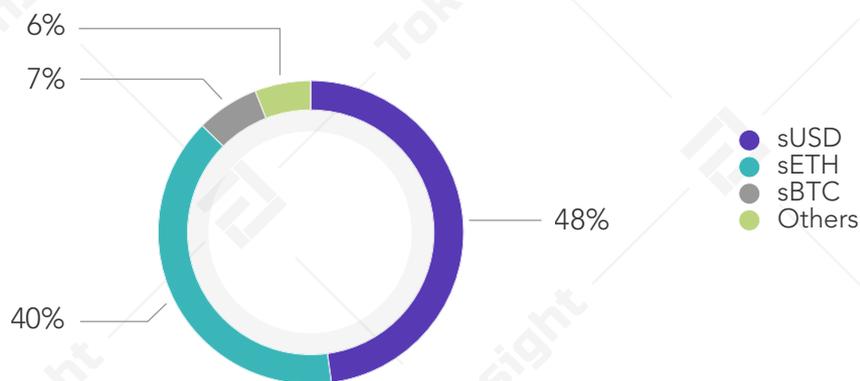
2.2 DeFi Derivative Assets

" Synthetic assets are the combination of securities to simulate the price of a different underlying asset and allow holders to not actually holding the underlying asset

Synthetic formerly known as Haven is a decentralized synthetic asset issuance protocol built-in Ethereum. It allows an individual who is bullish on the price movement of Bitcoin to buy sBTC (synthetic BTC) to gain exposure to the value of BTC. And it also allows individual who is bearish on the BTC to buy the iBTC (inverse BTC) to short the price. There are four categories Synth: fiat currencies, commodities, cryptocurrencies, and inverse cryptocurrencies.

► Distribution of Synth within the network

Source: Synthetix Dashboard



Synthetic saw an exponential growth in the second half of 2019, surpassing Compound to become the second largest Ethereum DeFi platform by total value Locked in USD. **It began with less than \$2 Million in Jan 2019 reached \$180 Million in TVL at its peak, with nearly 90% of the circulating Synth being sETH and sUSD, and the rest distributed across 10 different other Synth.** The platform is significantly over-collateralised (i.e., 750%) resulting ~84% of the SNX supply being locked away in the network.

With Synthetix further integrates with Chainlink oracle and planning DAO migration in 2020 to further decentralise its protocol. We believe Synthetix brings unique value to the DeFi ecosystem and should continue maintaining its top position in the DeFi ecosystem provided that the project continues to evolve and strengthen its mechanisms to build a robust DeFi platform.

2.3 Stablecoin

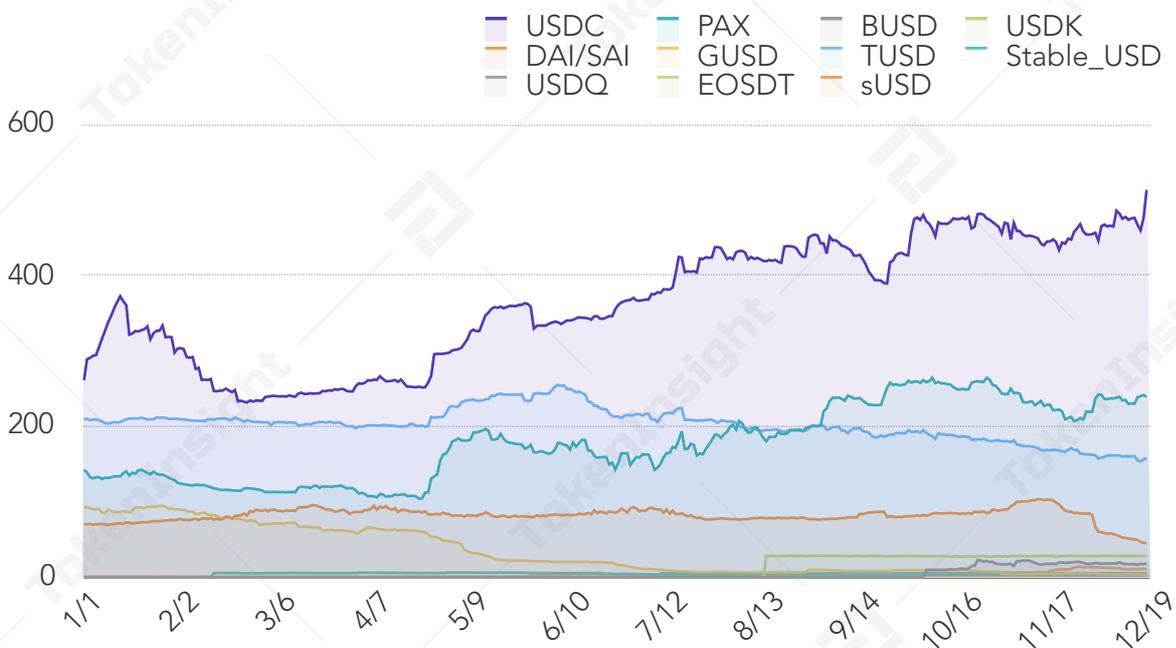
“ Stablecoins create a channel for market participants to exit the volatile market by selling the assets back to the stablecoins without touching the actual fiat system

It is the industry consensus that the cryptocurrency market is a high-risk financial market due to high volatility and uncertainty around global regulations.

There are three kinds of stablecoins, fiat&commodity-backed, crypto-backed algorithmic stablecoins. Unlike fiat or commodity-backed stablecoins, algorithmic stablecoins use software code to set certain rules in order to maintain the supply and demand of stablecoins at an equilibrium.

► The Stablecoin Market Landscape (million \$, Excl. USDT)

Source: CoinmarketCap, TokenInsight



2.3.1 MakerDao and DAI

“ MakerDao and DAI is the biggest DeFi protocol on the Ethereum ecosystem, accounted for 50% of the total value locked in DeFi

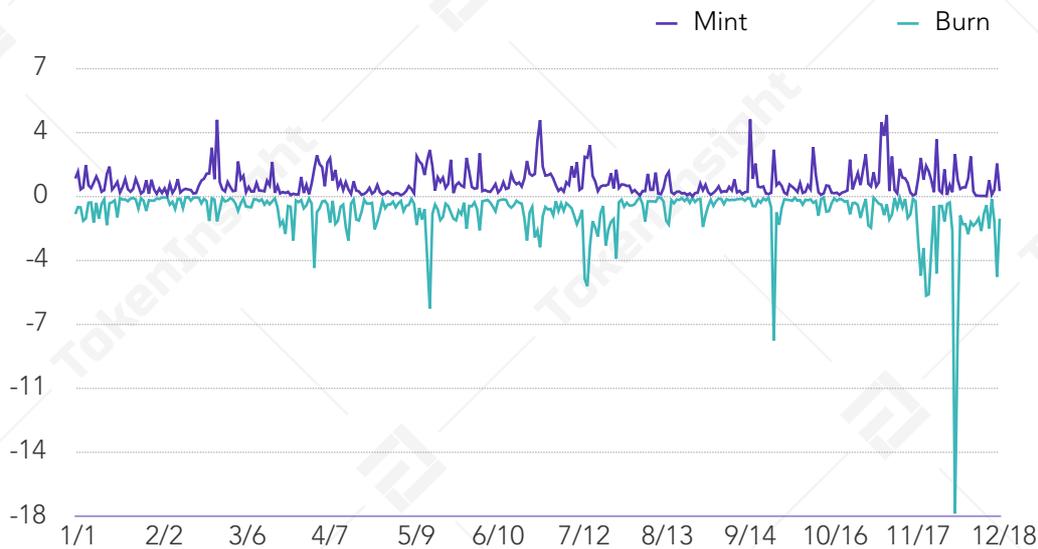
DAI is a crypto collateralised stablecoin whose value is pegged to the US Dollar, which used Pooled Ether (for Single Collateral DAI) or MKR and other tokens (for Multi-Collateral DAI) as collateral. The value of DAI is backed by Ethereum and stabilized by the Maker governance protocol using smart contract on the Ethereum network through a dynamic system of Collateralized Debt Positions (CDPs), autonomous feedback mechanisms, and appropriately incentivised external actors.

With the launch of Multi-collateral DAI on Nov 18 2019, enables the holders to earn savings via DAI saving rates automatically and natively by locking their DAI into the DSR contract and receiving the interest natively in DAI instead MKR token (Single Collateral DAI).

As the MakerDAO CDPs can alter the total supply of outstanding DAI by creating DAI when new assets are leveraged and destroying existing DAI when it is repaid to the position. **The conversion from Single-collateral DAI to Multi-collateral DAI brings a dramatically increase on burning with a peak value of \$17.85 Million on Dec 2 2019.**

► DAI Minting & Burning (Million \$)

Source: Aleth.io, TokenInsight



There are a lot of frictions around DeFi lending, the DAI universe as a concept is getting bigger and solutions are being proposed and developed. We will be seeing variations of DAI to continue emerging to enable composability and wider adoptions in the ecosystem.

► The DAI Universe

| Project | Description |
|---------|--------------------------------------------------------------------------------|
| DAI | Multi Collateral DAI, Decentralized stablecoin pegged to \$1 USD |
| SAI | (Legacy DAI) Single Collateral DAI, Decentralized stablecoin pegged to \$1 USD |
| xDAI | Pegged to DAI, but on a POA sidechain for fast transactions and low gas prices |
| cDAI | Tokens representing a balance earning interest on Compound |
| iDAI | Tokens representing a balance earning interest on Fulcrum |
| rDAI | Tokenized interest that's sent to a third party (developer, charity, dapp) |
| gDAI | Uses iDAI interest to enable future gas-less DAI transfers |

Source: Jordanlyall GitHub

▶ The DAI Universe

| Project | Description |
|---------|-------------------------------------------------------------------------------------------------------------------------------|
| IsDAI | Earn Compound interest on your collateral with rDAI, while providing liquidity for hedges against variable Compound interest. |
| wxDAI | Wrapped xDAI bridged to Mainnet in a form of ERC20 |
| idleDAI | Rebalances between Compound and Fulcrum |
| maxDAI | Rebalances between Compound and dYdX |
| swanDAI | Get exposure to DeFi black swan events via synthetic tokens |
| pDAI | A no-loss donation protocol enabling people to pool money together, lend it out, and donate the interest to a cause. |
| HCDP | rDAI where the 3rd party is fixed to a HumanityDAO UBI fund |
| WeiDai | A protective wrapper for DAI against inflation |
| Chai | Chai tokenizes the DAI Savings Rate. Earn interest on DAI without having to lock it up. |
| DAI-HRD | Earn interest on your DAI, while continuing to function as a standard token. |
| zkDAI | Hidden DAI transactions using zkSnarks |
| yDAI | Get short exposure on DAI |
| ∞DAI | Earned interest goes to smart contract cover insurance |
| nmDAI | Similar to above, cDAI with built-in Nexus Mutual contract cover. |
| DDAI | Gas station network enabled interest delegating DAI with smart DeFi recipes |

Source: Jordanlyall GitHub

2.3.2 Equilibrium and EOSDT

EOSDT is a stablecoin backed by EOS collateral on Equilibrium based on the EOS framework. It is MakerDao on the EOS network with different structures to enable DeFi on EOS with its native governance token NUT shares a similar role for EOSDT as MKR does for MakerDAO.

The EOSDT stablecoin as the first project for Equilibrium went live in 2019 and has generated more than \$4.4 Million EOSDT in aggregated amount with an average of ~257% collateralisation ratio, an addition of \$17.5 Million in self-funded stability fund to cover smart contracts and payout the users to ensure they will get back their funds even if the collateralisation of the system drop below 100%.

► DAI/ETH and EOSDT/EOS Ratios

Source: CoinMarketCap, TokenInsight



2.3.3 Kava and USDx

The DeFi solutions that we have seen so far are focused on one particular blockchain platform, Kava enables the cross-chain composability for the DeFi ecosystem by bringing CDP to other major cryptocurrencies, built on the Cosmos SDK.

Kava is trying to capture the DeFi market by enabling DeFi features on the top major cryptocurrencies such as Bitcoin, Ripple, Cosmos. Enabling the growth of DeFi outside of Ethereum and EOS. Similar to MKR & NUT, DAI & EOSDT as governance token and stablecoin respectively. Kava token as the governance token and USDx as the stablecoin.

► Key Details on Major DeFi Protocol

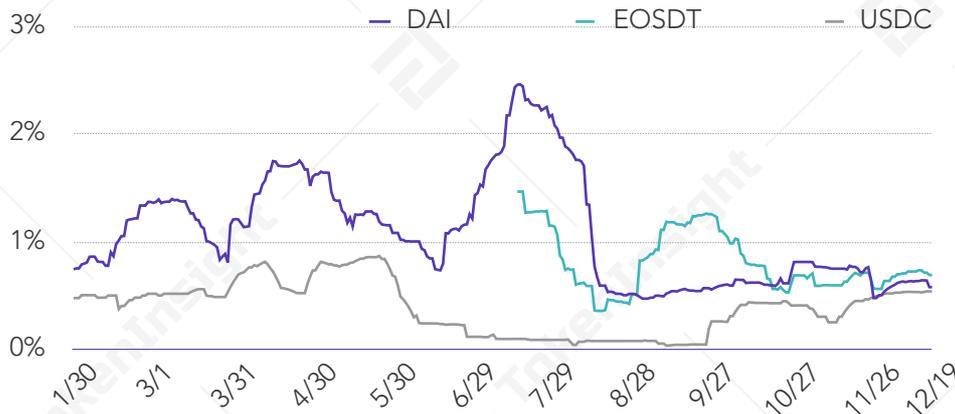
| Parameter | MakerDao | Equilibrium | Kava |
|---------------------|------------|-------------|-------------|
| Collateralisation | 150% | 130% | 150% |
| Stability Fee | 3% | 1% | 5% |
| Liquidation Penalty | 13% | 15% | 12% |
| Liquidator Discount | 3% | 3% | - |
| Platform | Ethereum | EOS | Cosmos |
| Stablecoin Symbol | DAI, SAI | EOSDT | USDx |
| Stablecoin Issued | 90 Million | 1.8 Million | - |
| Mainnet Launch Date | Early 2015 | Mar 2019 | Nov 16 2019 |

Source: TokenInsight, DeFiPrime, Kava, Equilibrium, MakerDao Whitepaper

USDC is backed by fiat and issued by a regulated financial institution, it is relatively stable compared to DAI and EOSDT. However, with the development of DeFi, the volatility of algo-backed stablecoins starts to get lower since the middle of 2019. We expect the trend to continue and eventually converge with the volatility of USDC or other fiat-backed stablecoin.

► DAI, EOSDT, USDC 30-Day Price Volatility

Source: CoinMarketCap, TokenInsight

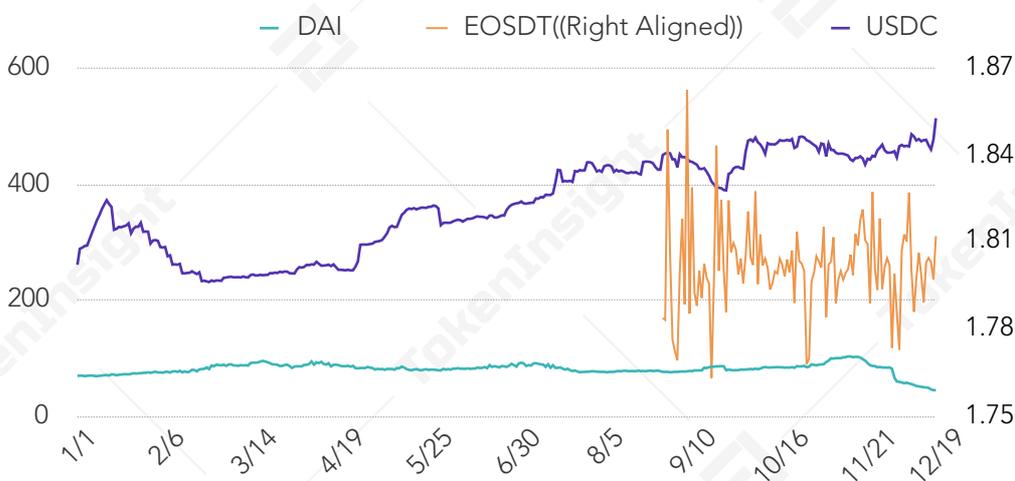


USDC has been widely recognised by the industry with a consistently growing market cap in 2019 and crossed \$500 Million to compete with USDT. In contrast, DAI only reached \$100 million at its peak.

The DeFi stablecoins have huge growth potential. However, the stability mechanisms, governance models need to be fully tested by the market in order to drive a much wider adoption. When these mechanisms can be well tested, we believe the market of decentralized stablecoins will score a substantial increase with its value growing **at least 5 times.**

► Market Cap of USDC, DAI and EOSDT (Million \$)

Source: CoinMarketCap, TokenInsight



2.4 Asset Management Tools

" The corresponding Asset management services in DeFi covers wallets, apps, and dashboards designed for users to manage their cryptocurrencies and assets

2.4.1 Wallet

Non-Custodial Wallets and Smart Contract Wallets are two key categories of DeFi wallet.

▶ Non-Custodial Wallet VS Smart Contract wallet

| Non-Custodial Wallet | Smart Contract wallet |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Users are able to safely custody their own funds without having to rely on third-party institutions to hold their assets. | Enable the creation of a non-custodial wallet that streamlines user experience to resemble traditional consumer-friendly banking solutions. |

Source: TokenInsight

Except for all the basic features ordinary crypto wallet should have, a well-structured DeFi wallet should also have some or all of the features identified below.

- Access to the DeFi applications and DeFi assets
- Lend assets and borrow money
- Non-custodial

▶ DeFi Wallets for Asset Management

| Non- Custodial Wallet | Smart Contract Wallet | Hardware Wallet | Other Wallet |
|-----------------------|-----------------------|--------------------|--------------|
| Coinbase Wallet | Argent Wallet | Bitpie | AlphaWallet |
| InstaDapp | Gnosis Wallet | Trezor Wallet | Fetch |
| Trust Wallet | - | Ledger Nano Wallet | Dexwallet |
| Metamask | - | - | Scatter |

Source: TokenInsight

2.4.2 Crypto Asset Management Protocol

Crypto asset management protocol refers to the protocol created by certain platform, aiming to manage crypto investments or deposits on behalf of others. The general goal is to grow a user's portfolio over time while mitigating risk. There are a few Crypto asset management protocol exist in the DeFi ecosystem at the moment, with emphasis on diversification.

► **Comparison of TokenSets and Betoken**

| Project | TokenSets | BeToken |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Managing crypto asset by automated asset management strategies | Crowd-powered asset management protocol using community managers to manage crypto assets |
| Fee | Network fee only to record ownership of the assets traded on TokenSets | Management fee at 0.1% (IF the fund is profitable or not profitable) and 20% (Only if the fund is profitable) |
| Type of Management | Users choose Asset Management Strategies | Actively managed |
| Methods to maintain performance | The existence of rebalancing mechanism, which will adjust underlying allocations periodically according to the performance of the specific components of the crypto assets managed | The issuance of the reputation token Kairo: people who manage funds on Betoken need to have Kairo, and the Kairo they get are related to their management performance |
| Security | Powered by audited code No counterparty risk Guaranteed Collateralization | With tested and audited smart contracts Fully Collateralization |

Source: TokenInsight

However, the current asset management or banking on crypto is very disjointed, there is no one stop shop to manage your DeFi assets with one single front end or wallet. A user has to jump onto multiple platforms or services to get the best management. The future of asset management frontend must be integrated with multiple protocol, assets, wallets to give users a seamless experience.

Sets are built in asset management strategies: Trend trading, Range bound, Inverse. As the components of Sets will rebalance automatically according to the market performance and the strategy. The return can be promised in certain degree.

► **1 Month Average Performance of Tokensets' management strategies**

Source: Tokensets, TokenInsight



► **1 Month Performance of Betoken**

Source: Betoken, TokenInsight

-1.19%



As assets are managed by managers in Betoken's community, whom will be selected according to their management performance gradually. It will take times before excellent managers are discovered. By then, the performance will be better.

2.5 Insurance Products

" The development of Insurance products shifts the DeFi ecosystem to recognise risks and make available the essential products for investors to hedge risks, with Nexus Mutual reached \$1 Million in active cover amount, paving the way for greater adoptions in 2020

One of the biggest risks in the DeFi ecosystem is the smart contract risk. The DAO hack in 2016 raised awareness on smart contract security. We are now seeing DeFi developing insurance solutions specifically to insure smart contract risk. Solutions such as Nexus Mutual, Etherisc aim to decentralise insurance protocol to make available all the essential products to hedge DeFi specific risks.

Nexus Mutual is already live on the Ethereum mainnet and offers smart contract insurance on multiple platforms such as dYdX, Compound, Makerdao, 0x, Nuo network etc.

The insurance products on smart contract open the door for appropriate risk management and the ability to hedge such as black swan event.

2.6 Liquidity Aggregator and Market Making

" Liquidity aggregator and market-making improves liquidity and helps price discovery, enabling better experience and encouraging adoptions

Liquidity is especially important in the trading space. Low liquidity on decentralised exchanges restricted the growth of the DEX. **The total DEX volume in 2019 is over \$2.3 Billion with IDEX (\$845 Million), Oasis (\$491 Million) and Kyber Network (\$375 Million) in the top 3, accounted for 74% of the trading volume.** The liquidity problem of DEX can be solved by various ways, including the integration of a liquidity aggregator such as Kyber or a crypto market making bot- Hummingbot.

Hummingbot recently announced a new platform called liquidity mining, which enables anyone to run the platform and earn rewards based on how much liquidity they provide to various tokens. By allowing anyone to be a market maker, liquidity mining enables a decentralized network of individuals to provide a service that only quantitative hedge funds could do before. Hummingbot has partnered with 8 projects and exchanges who will fund these reward pools and plan to launch the first wave of liquidity mining campaigns in early 2020.

Kyber announced the Katalyst upgrade to further cementing its position as the liquidity layer to provide the single on-chain endpoint for DeFi.

Although, the growth of the DEXs has been relatively slow and steady in 2019, the DEXs should see a stronger growth in 2020 with focus on the liquidity improvement. e.g. Liquidity mining, Katalyst upgrade.

2.7 Oracle

" With DeFi ecosystem grew significantly, the market started to see the integration of oracle(s) with the DeFi applications to act as a data agent, Chainlink dominates the market share with the rest follows

Blockchain is like an isolated island who can only access information that's within its network. Smart contracts open the possibility to reform the traditional institution-driven-market to a decentralised market by using code instructions and predefined events to perform tamperproof backend execution. However, we need oracles to act as an intermediary to provide real world data to the blockchain. Such data could be anything ranging from price of cryptocurrencies to the temperature of a certain city. In another word, Oracle is like an agent who connects and transfers real world data with the blockchain.

A certain smart contract can employ an oracle to retrieve off chain data for it or push data outside of its native blockchain to the real world. Thus, makes different kinds of DeFi application feasible on the blockchain network.

There are more than 6 different oracle projects in the blockchain space, with each of them focuses on different aspects to create decentralised data feed to support the development and creation of decentralised finance ecosystem. Chainlink is the major oracle project in the industry with projects such as Band Protocol and Tellor catching up the adoptions and focusing on creating data endpoints.

The future of DeFi world needs multiple oracles to further decentralise the ecosystem, creating plug and play decentralised finance consumer applications to bring unique experiences to the users.

► Key Details on Major Oracle Projects

| Parameter | Chainlink | Band Protocol | Tellor | Augur | Aeternity |
|---------------------|---------------|---------------|----------------|-------------------|----------------|
| Market Cap | \$668 Million | \$4 Million | \$2.3 Million | \$107 Million | \$39 Million |
| Platform | Universal | Universal | Universal | Prediction Market | Universal |
| Started | Late 2017 | Early 2019 | Early 2019 | Late 2014 | Early 2017 |
| No. Integrations | 70 | 10 | - | Various | Various |
| Consensus Mechanism | dPoS | dPoS | Hybrid PoW&PoS | - | Hybrid PoW&PoS |

Source: Whitepaper

2.8 Discussion on Arbitrages, Risks and Regulations

2.8.1 Arbitrage Strategies

" The existing of interest arbitrage opportunities reflect that the DeFi lending market is far from efficient

An arbitrage strategy is a strategy to take advantage of price differences across markets due to market inefficiency to realise the risk-free profit.

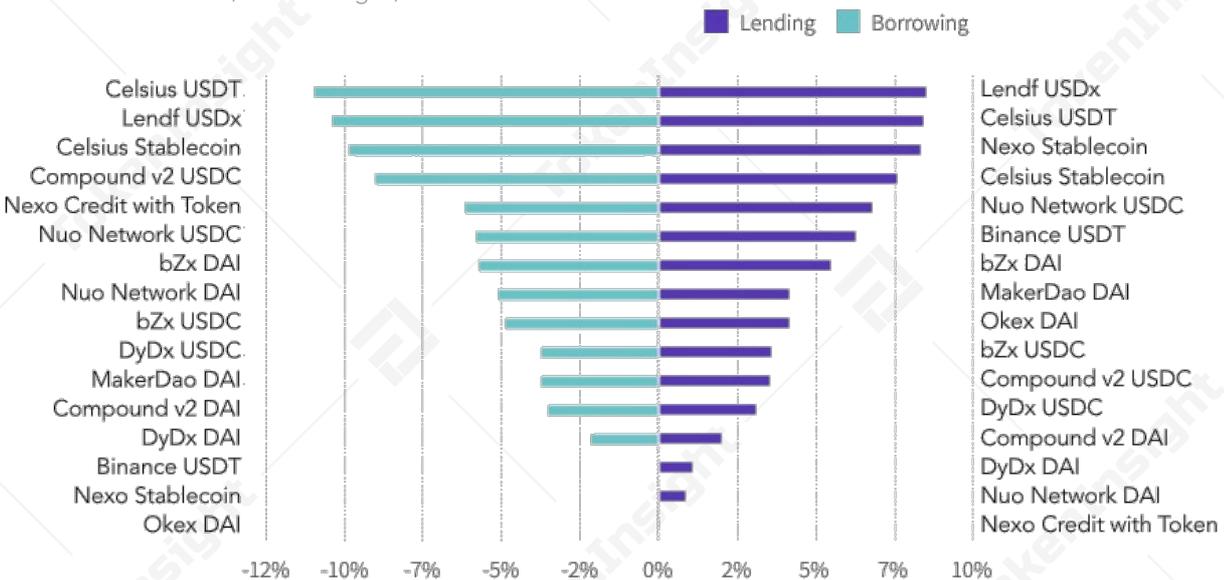
Interest rate arbitrage normally regards to the situation where the lending rate is below the borrowing rate on another platform. The arbitrage opportunities can be explored within and between DeFi, CeFi, Staking ecosystem and even with the traditional financial market.

Single Platform Cross-Asset Interest Rate Arbitrage

A trader can leverage carry rate that involves borrowing at a low-interest rate and investing in an asset that provides a higher yield. For example, on the dYdX platform; USDC and DAI are two stablecoins pegged to USD, however, the DeFi market offers higher yields on DAI than USDC, possible due to the market perceives risks differently on USDC and DAI and/or the actual mechanism behind USDC and DAI are very different, thus based on the law of one price, an interest rate arbitrage opportunity emerge on the market.

► Cross Platform Cross-Stablecoin Yield

Source: Loanscan, TokenInsight, Dashboard



Cross-Platform Cross-Asset Interest Rate Arbitrage

Taking the arbitrage trades to multiple platforms (CeFi and DeFi). A trader can look for interest rate arbitrage opportunities across different platforms in the CeFi and DeFi system. e.g. Celsius Network offers 8% on the USDT deposit whereas the borrowing rate for DAI on the dYdX platform is ~2%. In theory, the trader can realise the risk-free interest rate profit by borrowing DAI on dYdX, converting to USDT and depositing to Celsius Network, realising a net positive return of 6%.

Staking Yield Arbitrage

Staking yield in PoS as interest rate yield in lending. Assuming the price of the staked asset does not change in the staking period. A trader can realise staking yield arbitrage by borrowing DAI on e.g. dYdX platform and converting to e.g. Kava for staking to realise a net positive return of 10%.

Crypto Options as an Income Strategy

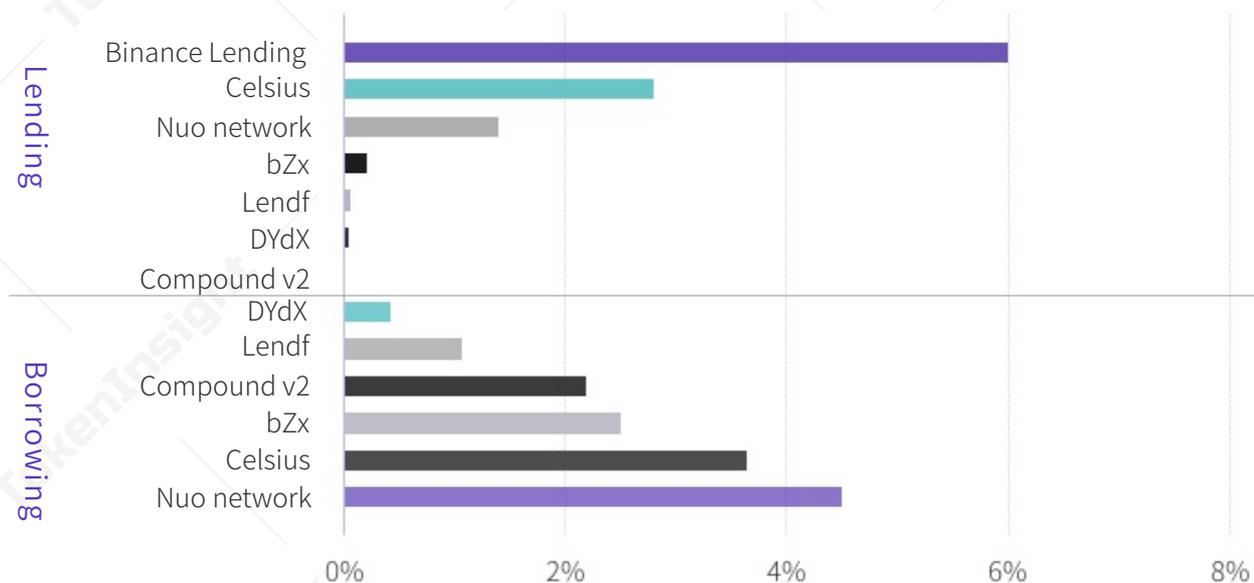
The strategy involves writing (selling) a call option to the option buyer at a cost against the amount of Bitcoin users own on the platform. In some cases, the yield for writing BTC options is materially higher than outright lending. However, options are complex and there are a lot of factors need to consider in order to realise the profit.

Cross Exchange Price Arbitrage

Triangular Arbitrage exists from a pricing discrepancy among three different cryptocurrencies. A trader can buy ETH on exchange 'X' using BTC, Sell ETH on exchange 'Y' for e.g. MKR and converting MKR to BTC and transfer back to exchange 'X' to realise the triangular arbitrage due to pricing inefficiency.

► Cross Platform ETH Yield

Source: Multiple, Tokeninsight



Priority Gas Auctions (i.e., Front Running)

Ethereum transactions consume gas (i.e., Transaction fee). The higher the transaction fee, the higher the chances of being confirmed by the network in the next block. Theoretically, a trading bot can submit a "front running order" by submitting a slightly higher gas fee to outcompete the others, optimising their latency to realise profit just like the traditional equity market.

2.8.2 Risks & Limitations

" The potential of a black swan event also exists in the DeFi world where the whole system would suffer due to the interconnected nature of DeFi

DeFi presents a solid solution to the problems facing by people whose needs are not met by the traditional financial system, as well as providing a more direct route to consumers by cutting out some of the intermediaries and making it more efficient for consumers.

DeFi is still a financial market with various risks, including Financial risk (e.g. market, liquidity risk, risk of failing to evaluate gains and losses due to the lack of historical data), Technical risk (e.g. Infrastructure, smart contract risk), custody risks, regulatory risks, etc. The growth of diverse financial products, instruments and services may add systematic risk to the DeFi ecosystem where we may, or we may not have the necessary tools available to hedge against these risks. The market is constantly evolving, we hope the DeFi ecosystem can continue building more robust foundation to bring the DeFi to the general populations.

2.8.3 Regulations

The DeFi landscape might not be adopted by the general populations unless there is more regulatory clarity around digital assets or proper rules and procedures in place to mitigate various risks. Because of the fact that the industry exists in a legal grey area, the majority of enterprise businesses and institutional players are hesitated to get involved with decentralized finance.

There are views that Digital Banking Regulations can be used as a remedy for the lack of regulation on DeFi. If DeFi wants to have any chance of being a serious competitor of conventional financial institutions, a speedy yet effective resolution to the critical issue of a lack of investor protection measures under the DeFi framework is required. In this regard, some industry observers have put forth the idea that DeFi should leverage digital banking regulations to provide protection to its investors. DeFi, after all, offers financial services which are not unlike those provided by conventional banks, albeit through the use of blockchain as its underlying technology.

03.

THE FUTURE OF THE DEFI ECOSYSTEM

3.1 Interest Rate Swap and Smart Bond.

" Crypto smart bond combining Interest rate swap features enable many possibilities on DeFi "

At present, the majority of the crypto lending solutions on the market are at least 150% collateralised on average and only offers variable interest rates according to the liquidity available in each market based on the Compound protocol. The existing structure cannot well support those investors with different risk appetites and seeking a fixed interest rate investment.

Maple Finance launched its mainnet in beta on November 2019 to create the first SmartBond backed by Crypto assets integrated with compound protocol on the Ethereum Blockchain to further democratise DeFi. It is essentially a fixed income (i.e., bond) marketplace with different tranches combining Borrowing & Lending and interest rate swap features where the market participants can borrow & lend, swapping interest rate to hedge or speculate on the DSR.

The solution opens the door towards many possibilities, including the construction of crypto yield curve with different maturity of the SmartBonds, effective managing interest rate exposures, building a foundation for structured financial instruments such as asset-backed securities, covered bonds, collateralised debt obligations, etc.

3.2 DeFi Options Protocol

Options on DeFi allow investors to manage risk exposures to the desired level

In order to progress the DeFi ecosystem, various financial instruments need to be built to grow the market. Options is an important type of contingent-claim derivatives that can provide their owner with the right but not an obligation to a payoff determined by the future price of the underlying asset. Options can be a useful tool to hedge against stablecoin risk or bet on the underlying asset price.

Convexity Protocol by OPYN- Zubin Koticha proposed a generalised liquid options protocol in DeFi to provide investors with a way to hedge risks, create leverages, buy the insurance and make bets on volatility.

Options combining with many other financial instruments can create various trading strategies with different risk exposure, modifying investment positions for different purposes such as yield enhancement, reducing a position at a favourable price, target price realisation etc.

We believe the next stage of DeFi will integrate these derivatives such as options protocol to enable dynamic investment strategies and creating and realising value on the decentralised finance protocol.

3.3 Under-Collateralised DeFi

The current DeFi lending is over-collateralised to protect against asset volatility and loan default with 459% average collateral ratio

Alex Masmajan, Defiant contributor and DAO fiend provided some solutions to under-collateralise the DeFi. 1: Social Fund Recovery 2: A New Credit Score 3: Zero-Knowledge Proofs 4: Credit Market DAO.

The topic of under- collateralisation may be realised in the future, however not without a fully functional, diverse financial market foundation where market participants have the abilities to hedge credit risks, acquire information in an effective manner.

► Comparisons on Collateralisation Ratio

| Parameter | Maker SCD | Compound v2 | dYdX | Synthetix | Weighted Average |
|----------------------|-----------|-------------|------|-----------|------------------|
| Avg Collateral Ratio | 253% | 507% | 276% | 800% | 459% |
| Min Collateral Ratio | 150% | 150% | 125% | 750% | 294% |

Source: Loanscan, Synthetix Dashboard

3.4 Benchmark Interest Rate

" LIBOR for DeFi enables a diverse financial product to be created "

Current decentralized finance is fragmented with vastly different borrowing & lending rates offered on different platforms. As we have discussed in the previous section on arbitrage opportunities on DeFi, the market currently lacks an interest rate standard or benchmark to act as a reference rate just like London Inter-bank offered rate (LIBOR) in the traditional equity market.

The widespread use of LIBOR makes financial market more efficient and various standardised financial products can be created based on one single benchmark rate such as bond index, forward rate agreement and many more.

Financial professionals can use the yield curve derived from LIBOR or other benchmark rates to evaluate market risks and derive appropriate investment strategies for the clients.

In order to create a crypto bond yield curve to effectively value and price crypto smart bond and other financial instruments. A benchmark reference rate must be proposed and adopted by the industry in order to create a much more dynamic DeFi financial market and attract traditional investors to the ecosystem. With centralised exchange like Okex integrates DAI Savings Rate (DSR), we are about to find out whether DSR would be adopted by the industry to be the pseudo-benchmark rate for DeFi in 2020.

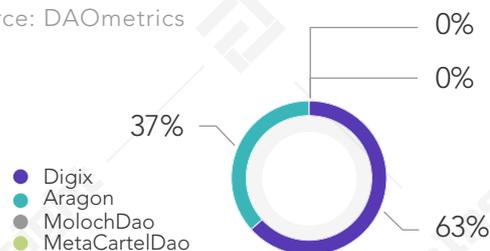
3.5 Decentralised Autonomous Organisation (DAO)

" Decentralised Finance meets decentralised Governance, Decentralised Autonomous Organisation (DAO) creates a new way to interact with the DeFi ecosystem "

DAO is a vital element in the DeFi ecosystem. In order to further decentralised the DeFi ecosystem, DAO enables an organisation to run autonomously, in a decentralised manner to make decisions, grow to serve its overall purpose. Currently there are 1500+ Tokens and ~ 50 DAOs .

► DAO Locked in Value in thousands USD

Source: DAOmetrics



From our view, DAO can help the ecosystem grows substantially, create decentralised governance models to achieve the vision of DeFi. As Kyber Network and Synthetix join the DAO wave, we predict that the next stage of the DeFi will be the integration of DAOs to become a truly decentralised ecosystem and creating a governance model that includes multiple, independent entities providing services to the protocol. The resurgence of DAOs along with the growth of different DeFi solutions will be the next wave in the cryptocurrency space.

04.

CONCLUSION

" Don't trust, verify. We should see a positive correlation between the growth of DeFi and gas used in the near future "

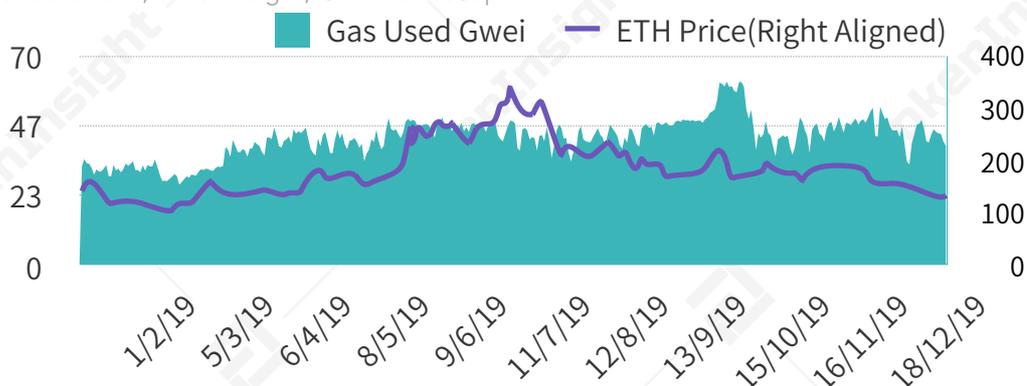
The current DeFi ecosystem is a small, niche area in the cryptocurrency market. It perhaps worth a fraction of the total market capitalisation of the entire cryptocurrency market. Ethereum is the predominate platform for today's DeFi ecosystem. However, the DeFi concept is blockchain agonistic, meaning it does not restrict to one particular blockchain infrastructure, platforms like EOS, BTC are trying to catch up but they are still lagging in terms of the development resources and industry adoptions.

The emergence of various financial instruments and the exponential growth of the DeFi Lending are creating an alternative financial system, like a parallel universe, mirroring and growing the traditional financial market. While the DeFi solutions reduced the counterparty risks, technical risks such as smart contract risk emerge in the industry. Promisingly, we are seeing different risk mitigation products and instruments start to surface in this market, such as insurance, interest rate swap, DAOs. There are several financial products, services and instruments are being conceptualised and building at the moment, including The Yield Protocol: On Chain lending with interest rate discovery, Hedger Protocol: Write and settle option contracts on Ethereum, Stafi: Liquid taking assets, etc. Although 2019 is a big year for DeFi, it is still too early to suggest who will be the clear winners in this disruptive and fast pace environment.

Decentralised finance is realising the value of Blockchain and its ecosystem. It is the time that when banks and traditional finance industry face turmoil, Satoshi released Bitcoin's whitepaper. Yet, more than 10 years later, we are seeing the beginning of the decentralised finance ecosystem to give back powers to the individuals, enable transparency and instead of trusting the system, but verifying the information leveraging the blockchain technology.

▶ Gas Usage VS ETH Price(Left Aligned: billion Gwei, Right Aligned: \$)

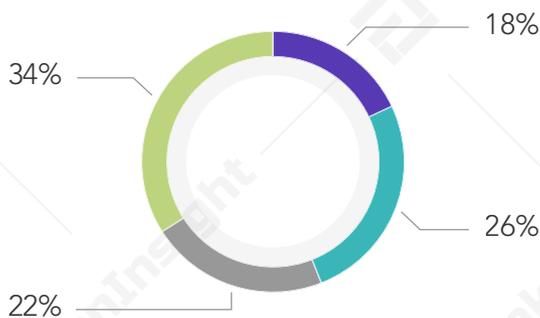
Source: Etherscan, TokenInsight, CoinmarketCap



05. THE STATE OF DEFI-2019

What drew you to the DeFi community?

Source: DeFiPrime



1/3 of the respondents wish to build a fairer future for the world, with 1/4 of the respondents attracted by the gains or returns on the DeFi platform.

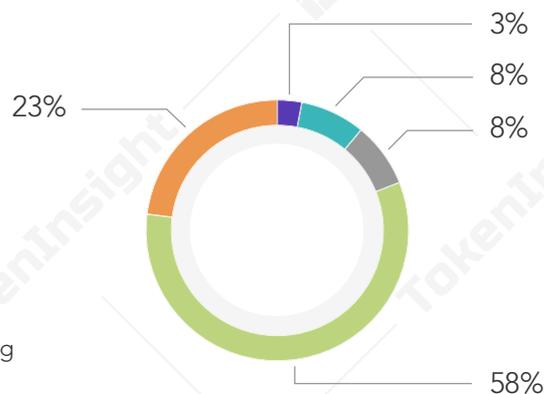
- Heard of DeFi and wanted to learn more
- The gains or returns
- To control my own money
- To build a fairer future for the world

More than half of the survey respondents are an active member of the community and with the second most of the respondents building the DeFi products, indirectly shows that the current DeFi ecosystem is a small, niche area in the industry.

What's your level of DeFi comprehension?

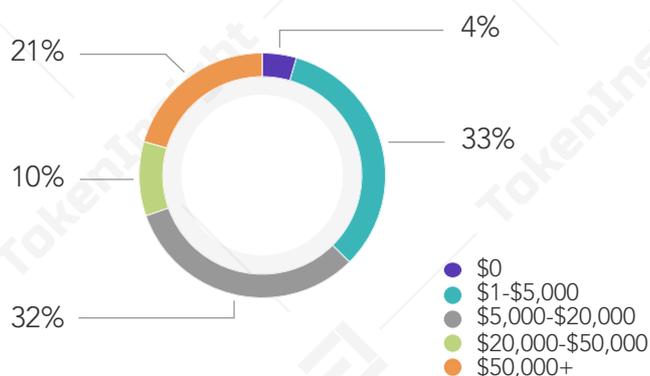
Source: DeFiPrime

- What is DeFi?
- Kinda get it
- Can follow along but not participating
- Active member of the community
- Build DeFi products



How much have you invested in 2019 into startups, crypto assets or DeFi?

Source: DeFiPrime



The majority of the respondents have invested some portions of the saving into startups, crypto assets or DeFi, with more than 50% of the respondents are willing to put more than half the savings into DeFi lending platforms.

06.

APPENDICES

6.1 2019 DeFi Project Rating Results

TokenInsight released the 2019 DeFi project rating based on the recent performance of selected projects. There are 14 projects in total in the Jan 2020 issue of which Maker, Chainlink, and ETHlend were upgraded. The rest of the 11 projects have been newly added to the list.

► 2019 DeFi Project Rating

| Project | Rating | Previous Rating |
|----------------|--------|-----------------|
| Maker | BBB | BB |
| Chainlink | BBB | BB |
| Bancor Network | BB | BB |
| RSK | BB | - |
| ETHLend | BB | B |
| Nexus Mutual | B | - |
| Band Protocol | B | - |
| bZx | B | - |
| Synthetix | B | - |
| Betoken | CCC | - |
| Nuo Network | CCC | - |
| Bloom | CCC | - |
| Kava | CCC | - |
| EOSDT | CCC | - |

Source: TokenInsight

6.2 2019 the Most Promising DeFi Projects

TokenInsight released the 2019 the most promising DeFi projects list. These 27 projects only represent part of the DeFi ecosystem. The list is in no particular order.

▶ 2019 The Most Promising DeFi Projects

| Project | Description |
|-----------------------------------------|------------------------------------------------------------------------------------------------|
| Maple Finance | SmartBonds for the new world of finance |
| Argent Wallet | Crypto smart wallet |
| pTokens | The ERC-20 version of other currencies on the blockchains other than the Ethereum one |
| Sablier | Continuous salaries on Ethereum |
| Dharma | Stablecoin savings accounts |
| Poketto | A wallet that you can actually show to your parents |
| Uniswap | A protocol for automated token exchange on Ethereum |
| Convexity Protocol | A generalized protocol for options contracts on Ethereum |
| Kyber Network | On chain liquidity protocol |
| Tellor | The standard oracle for Decentralized Finance |
| DeFi Zap | Get instant exposure across multiple DeFi protocols based on your investment goals |
| dYdX | Open trading platform for crypto assets. |
| UMA Project | Decentralized financial contracts platform |
| Ash Finance | DeFi Robo advisor |
| lendf.me | A decentralized lending platform with instant borrowing and withdrawal capabilities |
| Hummingbot | An open source, institutional-grade crypto market making bot |
| Equilibrium | The world's first decentralized EOS-based stablecoin framework |
| Compound | An interest rate protocol intended to power the financial markets & applications of the future |
| Melon Protocol | A blockchain protocol for digital asset management built on the Ethereum platform |
| Alpha Wallet | Ethereum mobile wallet with DeFi, Daos and games |

Source: TokenInsight

▶ 2019 The Most Promising DeFi Projects

| Project | Description |
|--------------------|------------------------------------------------------------------------------------|
| Zerion | Enables non-technical users to acquire, track and manage Ethereum based assets |
| Nitrogen | Decentralized peer-to-peer network for lending and borrowing crypto against crypto |
| Settle | A DeFi asset management banking frontend |
| The Yield Protocol | Zero-Coupon Bonds in Cryptocurrency |
| Celo | A platform for fast, secure, stable digital payments |
| Stafi | Provide the liquidity for the Staking Assets |

Source: TokenInsight

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Symbols and Definition of Risk Ratings

- AAA** The technical foundation is extremely solid, the status of operations is extremely stable, the extent of influence on the project by unfavorable changes in the environment or uncertain factors is extremely small, and risk is extremely low.
- AA** The technical foundation is very solid, the status of operations is very stable, the extent of influence on the project by unfavourable changes in the environment or uncertain factors is very small, and risk is very low.
- A** The technical foundation is solid, the status of operations is stable, the extent of influence on the project by unfavourable changes in the environment or uncertain factors is relatively small, and risk is relatively low.
- BBB** Technical feasibility is very good, the status of operations is stable, influence on the project by unfavourable changes in the environment or uncertain factors exists to a certain extent, and risk is controllable.
- BB** Technical feasibility is good, the status of operations is relatively stable, the possibility of influence on the project by unfavourable changes in the environment or uncertain factors exists to a relatively large extent, and risk is basically controllable.
- B** Technical feasibility is moderate, the status of operations is relatively stable, the possibility of influence on the project by unfavourable changes in the environment or uncertain factors exists to a very large extent, and risk is to a definitely limited extent controllable.
- CCC** The technical foundation or idea has certain problems, the application scenarios are limited, the project is susceptible to influence by uncertain factors, both internal and external, and has relatively large risk.
- CC** The technical foundation or idea has considerable problems, and application scenarios are highly limited, which makes for a project that has few internal or external factors to consider in the context of sound development, and carries a very large risk.
- C** The technical foundation or idea has substantial problems, and lacks deliberation upon possible application scenarios. The token has almost no usage value, and the project suffers from extremely large risk.
- D** The project is riddled with problems and carries an extremely high risk of failure.



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