

Yield Farming

DeFi

DeFi, short for Decentralized finance, refers to a financial system that operates on public blockchains and is open and accessible to anyone with an internet connection. This system is built on open-source technology that can be programmed by anyone, and allows users to borrow, save, invest, trade, and perform other financial activities quickly and without the need for paperwork or intermediaries. One of the key features of DeFi is its transparency, which allows anyone to inspect the system and its data. Users hold their funds in a secure digital wallet and can transfer them within minutes. DeFi is designed to eliminate the need for centralised institutions and third parties in financial transactions by utilising peer-to-peer networks, advanced software and hardware, and security protocols.

How does DeFi work?

DeFi is made up of smart contracts, which power Decentralized applications (DApps) and protocols. Initially, many of these applications were developed using Ethereum. Unlike traditional banks, there is no need to fill out an application or open an account. Transactions are recorded in blocks on the blockchain and verified by other users. When these verifiers agree on a transaction, the block is encrypted and closed, and a new block is created with information about the previous block. These blocks are linked together, forming the blockchain. Because information in previous blocks cannot be altered without affecting subsequent blocks, the blockchain is immutable. This concept, along with other security protocols, ensures the secure nature of the blockchain.

What can be done with DeFi?

DeFi offers various financial services and products that don't require traditional financial intermediaries. Some of the services include:

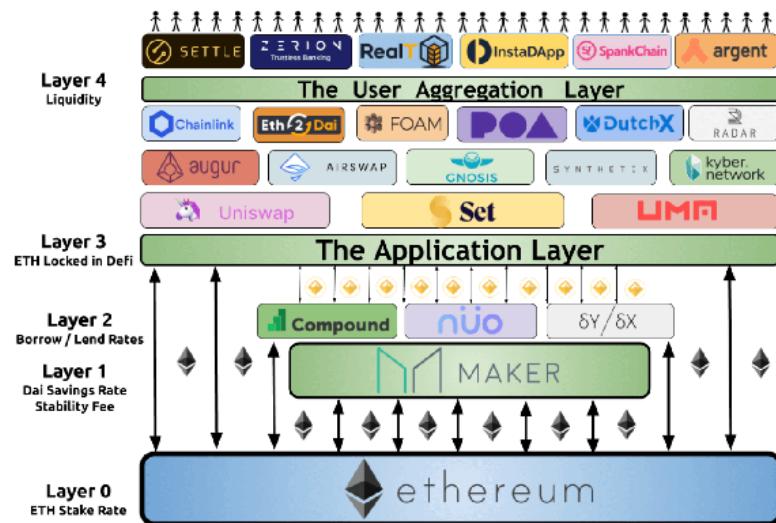
Lending: Earn interest and rewards every minute by lending out your cryptocurrency, unlike traditional finance where rewards are received only once per month. *Getting a loan: Get a loan instantly without any paperwork, including short-term "flash loans" that traditional financial institutions don't offer.* *Trading: Make peer-to-peer trades of certain cryptocurrencies, similar to buying and selling stocks without a brokerage.* Moreover, Ethereum allows for the creation of completely new financial products. Some of the opportunities provided by DeFi include sending money globally, streaming money globally, accessing stable currencies, borrowing funds with or without collateral, starting crypto savings, trading tokens, growing portfolios, funding ideas, buying insurance, and managing portfolios. This list is continuously growing.

Layers of DeFi

DeFi is a software solution that operates through a stack of components, consisting of four layers:

- 1. Settlement Layer:** Also known as Layer 0, the settlement layer serves as the foundation for all DeFi transactions. It is formed by a public blockchain and its cryptocurrency or a tokenized version of real-world assets, which can range from USD to real estate land parcels.
- 2. Protocol Layer:** The protocol layer defines all standards and rules for DeFi transactions, similar to how federal or regional rules govern financial transactions for banks. These protocols are interoperable and create liquidity within the DeFi ecosystem, allowing apps to convert virtual assets into real-world assets.

3. **Application Layer:** At the application layer, vendors create DeFi apps and services for users to interact with. These apps utilise the protocols from the bottom two layers and turn them into a product for consumers, such as lending services and cryptocurrency exchanges.
4. **Aggregation Layer:** The aggregation layer involves third-party vendors combining existing applications from the application layer to create appealing products for investors. Unlike traditional financial trading, the aggregation layer provides a complete virtual investment trade process, which is faster and more seamless without the need for a detailed paper trail.

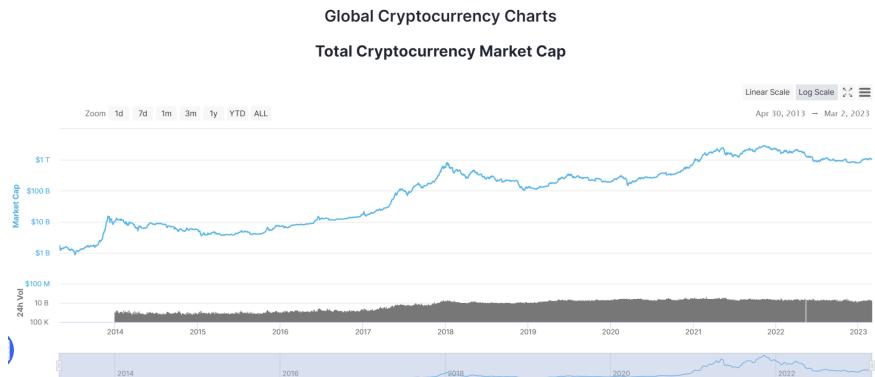


Yield Farming Boom

Over the past years, Decentralized Finance (DeFi) has become increasingly popular. In March 2020, the total value locked (TVL) in DeFi protocols was approximately 600 million USD. This metric indicates the amount of funds held in smart contracts related to DeFi protocols. However, this number grew exponentially during the following year, fueled by the "DeFi Summer" where TVL reached around 10 billion USD by the end of September 2020. As of November 2021, TVL numbers have exceeded 100 billion USD on Ethereum alone. One of the main reasons for the growth of this

industry is the composability of financial services, which allows protocols to combine functionalities without needing in-house expertise. This is facilitated by the "DeFi Stack" or "Money Legos," which provide key infrastructure such as decentralized exchanges, lending markets, and yield services for developers to plug in and focus on their core business. Additionally, the non-custodial aspect, permissionless nature, and auditable protocols of DeFi also contribute to its popularity. The result has been an explosion of innovation. One of the applications that has come from the above described movement is "yield farming", where investors passively earn yield by transferring tokens to a wide range of yield generating smart contracts.

The concept of earning yield by transferring tokens to smart contracts gained popularity with the introduction of COMP, the governance token of Compound, a major DeFi lending protocol. Through a process called "liquidity mining," users participating in Compound's lending and borrowing activities receive newly-minted COMP tokens as rewards. This process, along with the inherent benefits of providing liquidity in different kinds of pools, gave rise to the idea of yield farming, which involves searching for opportunities to generate returns on idle crypto assets within the DeFi ecosystem. To encourage early adoption of the issuing platform, additional governance tokens are rewarded to users. As a result of the creation of multiple platforms that offer returns through interests, fees, and token rewards, yield aggregators were built on top of DeFi primitives.



What is Yield Farming?

Yield farming, or liquidity mining, is a method of earning rewards with cryptocurrency holdings by locking them up. Essentially, users (called liquidity providers or LPs) add funds to liquidity pools, which are smart contracts containing funds, and earn rewards in return. These rewards may come from fees generated by the DeFi platform or other sources, and may be paid in multiple tokens. Yield farming is typically done using ERC-20 tokens on the Ethereum blockchain, but with advancements in cross-chain bridges and other technologies, it may become blockchain-agnostic in the future. Yield farmers frequently move their funds between different protocols in search of high yields, and DeFi platforms may offer economic incentives to attract more capital. Overall, yield farming is similar to staking but involves more complexity and strategy.

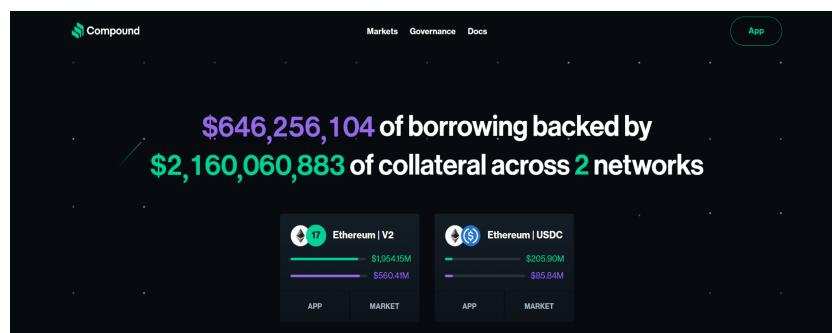
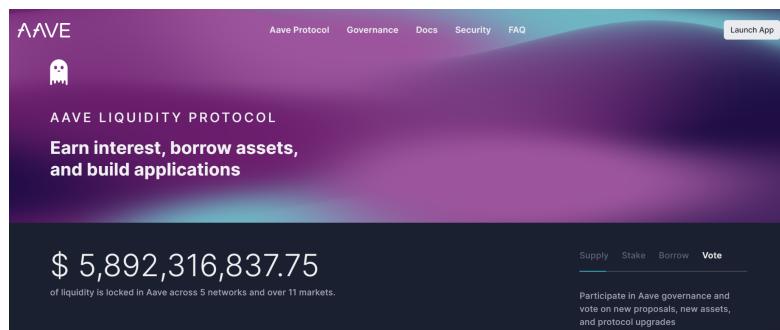
Fundamentals of Yield Farming

A yield aggregator refers to a protocol consisting of several smart contracts that collect investments from multiple investors and utilise them in various yield-producing products or services through interactions with their corresponding protocols. Yield farming, which is the process of generating yield from crypto assets, is carried out through yield aggregators. Users of yield aggregators are also known as yield farmers. Essentially, a yield aggregator functions as a fund manager that utilises pre-programmed investment strategies, automatically executed via smart contracts.

Yield farming relies on other building blocks in the DeFi stack. The essential types of protocols that are used within yield farming strategies are-

Lending Protocols:

Decentralized finance (DeFi) lending protocols are decentralized platforms that enable users to lend and borrow cryptocurrency assets in a trustless manner, without relying on a central intermediary like a bank. These protocols differ in their specific features and functionalities, but generally, they allow users to deposit their cryptocurrency assets into a smart contract on the blockchain, making them available for others to borrow. To secure the loan, borrowers are required to provide collateral in the form of other cryptocurrency assets, which is usually greater in value than the borrowed assets. The lending protocol sets an interest rate for borrowers, which is used to calculate the amount of interest they will need to pay back when they repay the loan. Some DeFi lending protocols also incorporate an automatic market maker (AMM) mechanism, enabling borrowers and lenders to trade with one another directly on the platform, improving liquidity and decentralization. In conclusion, DeFi lending protocols operate by allowing users to deposit collateralized assets and borrow with interest rates, and AMM can provide liquidity on these platforms. The most prominent lending platforms are Aave, Compound.



Automated Market Makers(AMMs):

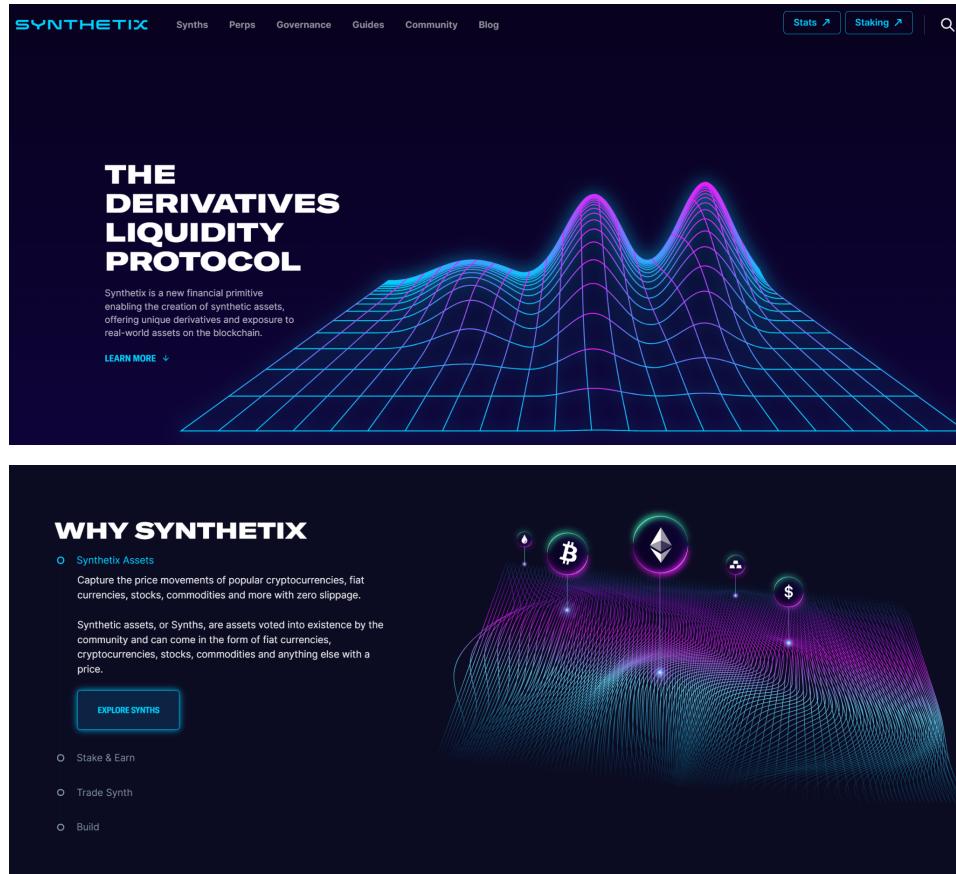
To facilitate the trading of assets in a trustless and decentralized manner, decentralized finance (DeFi) protocols commonly use an algorithm called an automatic market maker (AMM). An AMM operates by creating a pool of assets that can be traded by users on the platform. It automates the market-making process, leading to more efficient and liquid markets without the need for centralized intermediaries such as traditional exchanges. The Uniswap algorithm is a well-known example of an AMM that uses a constant product market maker (CPMM) formula to determine asset prices in the pool, ensuring that the total value of assets remains constant. Users can deposit or withdraw tokens from these pools, and the pool automatically adjusts the token balance and price according to supply and demand. AMMs offer efficient liquidity use, enable new market creation, and users can earn fees by providing liquidity to the pools. The most prominent AMMs are Uniswap, Balancer, Curve.

The top screenshot shows the Swap interface on the Curve website. A user is swapping ETH for DAI. The input field has 1 ETH selected, and the output field shows approximately 1322.89 DAI. The exchange rate is listed as 1,322.89702655 DAI/ETH. The bottom screenshot shows the POOLS page, which lists various liquidity pools along with their factories, types, base vAPY, rewards tAPR, volume, and TVL.

Pool	Factory	Type	Base vAPY	Rewards tAPR	Volume	TVL
3pool	0xb8...f1c7	DAI USDC USDT	USD	0.61% 0.35% → 0.89% CRV	\$170.3m	\$599.6m
sUSD	0x51...fbfd	DAI USDC USDT sUSD	USD	1.99% 1.11% → 2.77% CRV	\$36.0m	\$71.1m
stETH	0xd6...7022	ETH stETH	ETH	3.88% 0.00071% → 0.0017% CRV 3.88% LDO	\$8.5m	\$963.0m
tricrypto2	0x6f...a9d6	ETH USDT WBTC	CRYPTO V2	0.63% 5.54% → 13.86% CRV	\$7.5m	\$161.2m

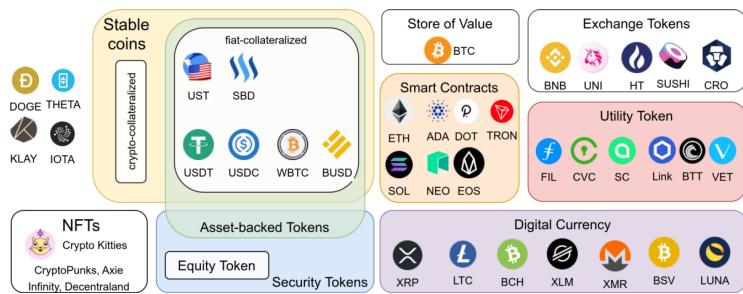
Others:

There are other DeFi protocols which can provide yield in different ways besides lending platforms and automated market makers (AMMs), which are the core of DeFi. They can do this through their own unique products or through liquidity mining initiatives. Synthetix is an example of a product that offers yield but is not categorised as a lending platform or an AMM.



The Fundamental component of DeFi which enabled decentralized financial transactions and services is the "Tokens". Tokens are typically created as part of an initial coin offering (ICO) or a security token offering (STO). It is a digital asset that is created and traded on blockchain networks such as Ethereum. Token can refer to various types of digital assets, including stablecoins, governance tokens, LP (liquidity provider) tokens, and yield tokens. Stablecoins are designed to maintain a stable value relative to a specific asset or currency, and can be considered either tokens or altcoins depending on their

implementation and blockchain platform (ex. USDT, Tether). Governance tokens are used in liquidity mining programs to incentivize users to supply liquidity into a protocol, these tokens give holders the ability to vote on important decisions related to the protocol, such as changes to the platform's fees, new features, or upgrades. By holding governance tokens, users have a say in the direction of the protocol and can earn rewards for their participation (ex. UNI, AAVE, COMP). While LP tokens represent a share of the liquidity provided to an AMM platform (ex. BAL). Yield tokens, on the other hand, represent a claim on the interest earned by a lending platform, and are created by lending platforms to allow investors to earn a return on their investment (ex. NEXO, Celsius, BlockFi). Whereas Exchange/Utility Tokens are used to provide access to a specific decentralized exchange (DEX) or centralized exchange (CEX) services and benefits (ex. BNB). It's important to note that while these tokens offer different benefits, they are all subject to price volatility and other risks inherent in the cryptocurrency market. It's important to thoroughly research and understand the specifics of a particular token before investing.



Risks Involved

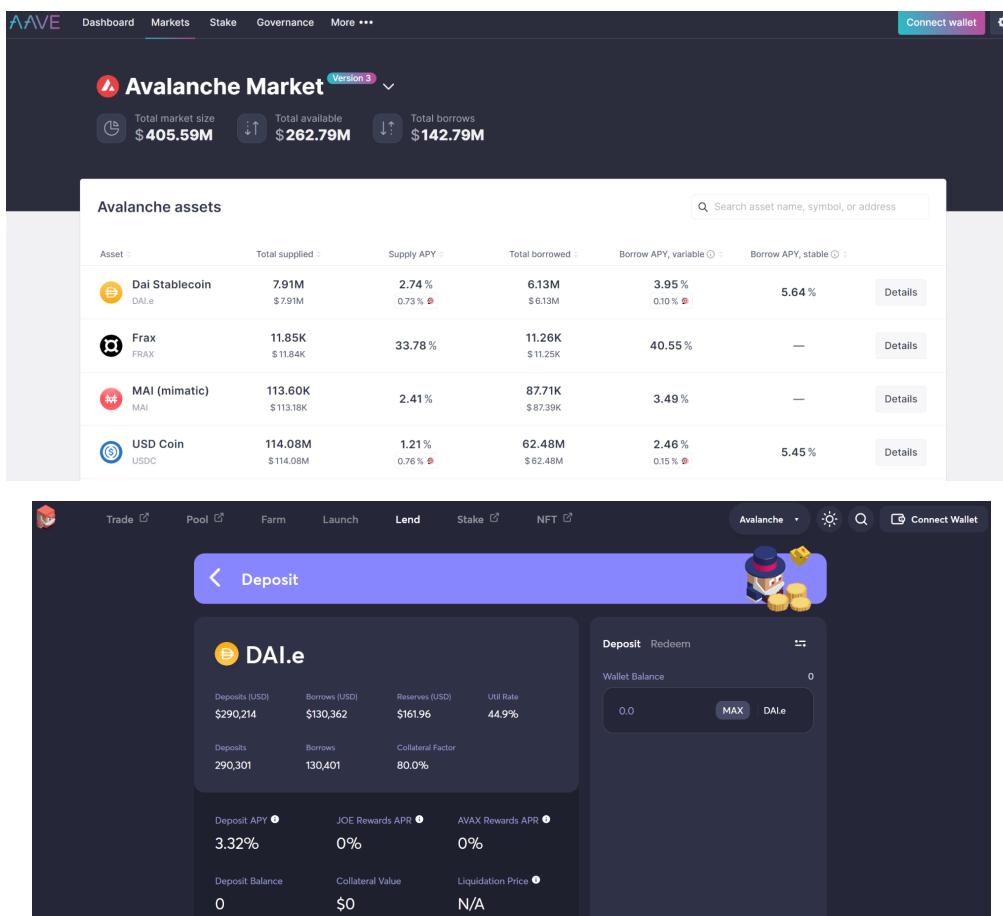
- 1. Smart contract risk:** Lending and AMM platforms are built on blockchain technology and rely on smart contracts to execute transactions. Smart contracts are lines of code that can be vulnerable to programming errors or hacking attempts, which could result in the loss of funds.
- 2. Price Volatility Risk:** Cryptocurrencies are highly volatile assets.

3. **Liquidity risk:** If there is insufficient liquidity in the lending or AMM platform, it can be difficult to execute trades or withdraw funds, which can result in losses.
4. **Impermanent loss :** AMMs constantly adjust the prices of assets based on supply and demand, there is a risk that the value of an asset may change dramatically if one of the assets in the liquidity pool loses value.

Yield Farming Strategies

Lending Farming

Choose a lending protocol, deposit your funds, borrow funds keeping your deposited funds as collateral, then choose a yield farming protocol to provide liquidity by staking the borrowed funds, earn rewards then reinvest it.



The image shows two screenshots of the AAVE lending protocol interface. The top screenshot is the Avalanche Market dashboard, showing total market size (\$405.59M), total available (\$262.79M), and total borrows (\$142.79M). Below it is a table of Avalanche assets with their respective statistics. The bottom screenshot is a 'Deposit' page for the DAI.e pool, showing current statistics like Deposits (\$290,214), Borrows (\$130,362), and Reserves (\$161,96). It also displays APRs (3.32%, 0%, 0%) and wallet balance information.

Asset	Total supplied	Supply APY	Total borrowed	Borrow APY, variable	Borrow APY, stable	Details
Dai Stablecoin DAI.e	7.91M \$7.91M	2.74 % 0.73 %	6.13M \$6.13M	3.95 % 0.10 %	5.64 %	Details
Frax FRAX	11.85K \$11.84K	33.78 %	11.26K \$11.25K	40.55 %	—	Details
MAI (mimatic) MAI	113.60K \$113.18K	2.41 %	87.71K \$87.39K	3.49 %	—	Details
USD Coin USDC	114.08M \$114.08M	1.21 % 0.76 %	62.48M \$62.48M	2.46 % 0.15 %	5.45 %	Details

Liquidity Provider

Choose a DEX, decide to which pool you need to provide liquidity, buy equal amounts of tokens in the pool, then add those into the pool on the DEX, generate rewards, trade those reward.

The screenshot shows the Curve Finance interface. On the left, the 'Deposit' section allows users to stake DAI, USDC, or USDT into a pool. It includes fields for minimum LP tokens, slippage tolerance, and estimated transaction costs. Buttons for 'Approve Spending' and 'Deposit' are present. On the right, the '3pool: USD' pool details are shown, including contracts (DAI, USDC, USDT), currency reserves, pool parameters (amplification coefficient A, virtual price, admin fee 0.005%), and rewards tAPR (0.56% daily, 0.45% weekly). Below this is the 'Swap' section, which shows a swap from CRV to USDT at an exchange rate of 0.666616. It includes fields for amount, slippage tolerance, and price impact, along with a list of trade routes (cvxCRV, cvxCrv/FraxBP, 3pool).

Yield Aggregators

Yield Aggregators automate the process of earning yields by automatically switching and shifting funds between different lending protocols, pools and platforms to find the highest interest rate at any given time.

Benefits of using Yield Aggregators are : Ease of use, Automation, High Yield, Diversification, Compounding Effect, Lower fees.

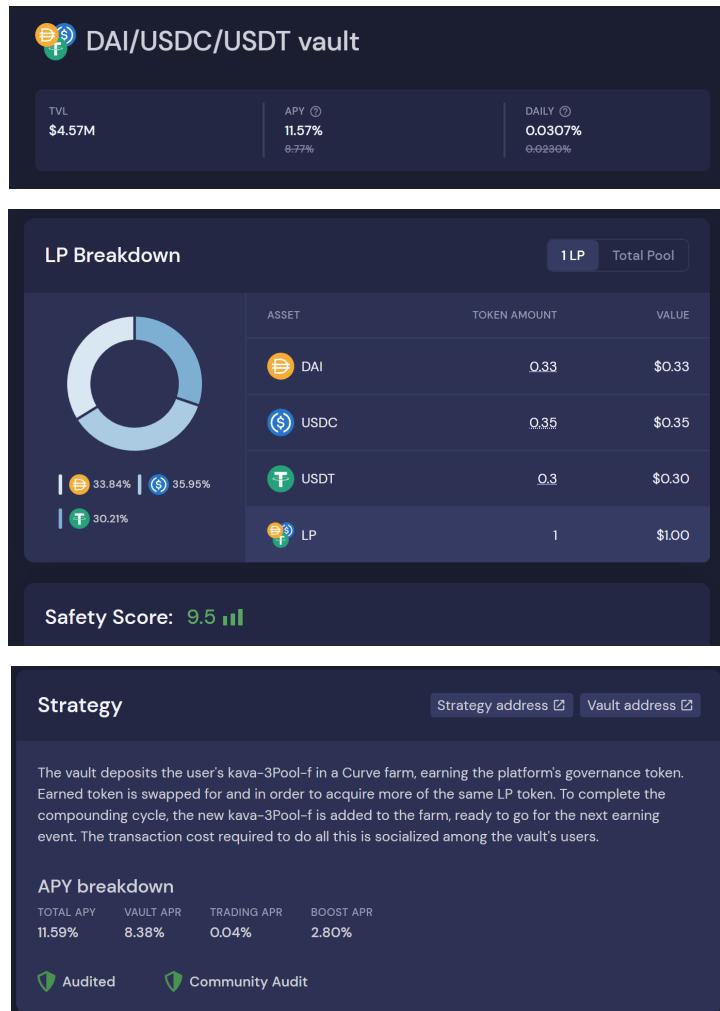
Yield Aggregator TVL Rankings							.csv					
All	Ethereum	BSC	Arbitrum	Polygon	Optimism	Avalanche	Fantom	Solana	Cronos	Klaytn	Kava	Canto
Name	Chains	1d Change	7d Change	1m Change	TVL							
1 Yearn Finance	OP, BSC, AVA, FNTM, SOL, CRONOS, KLAY, KAVA, CANTO	+1.14%	-0.63%	-1.36%	\$444.51m							
2 Beefy	OP, BSC, AVA, FNTM, SOL, CRONOS, KLAY, KAVA, CANTO	+0.98%	+8.56%	+19.32%	\$366.23m							
3 Origin Dollar	OP	+11.32%	+15.60%	+28.14%	\$60.62m							
4 Flamincome	OP	+1.63%	+0.14%	-0.12%	\$56.81m							
5 Idle	OP, AVA	+1.72%	+8.53%	-39.72%	\$49.4m							

Beefy Finance

It operates through a set of smart contracts on the Binance Smart Chain (BSC), which enables it to offer fast and low-cost transactions. The platform provides a suite of investment strategies called "vaults" that automatically allocate users' funds to the highest-yielding liquidity pools and farming opportunities on the BSC.

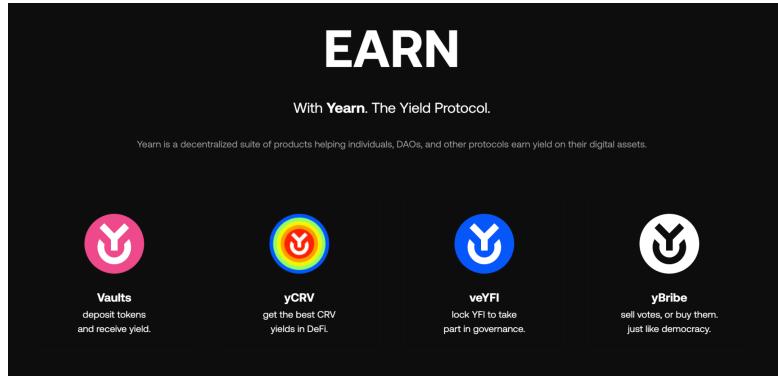
Beefy Finance's vaults are intended to be straightforward and easy to use, with no need for complex yield farming expertise. Users simply deposit their BSC assets into a vault, and the platform handles the rest. The platform provides a diverse set of vaults to suit a variety of risk inclinations, including cautious strategies that emphasise capital preservation and aggressive strategies that seek to maximise yield. Vaults charge 0.1% fees on withdrawal amounts and a 4.0% performance fee.

Search...	WALLET	DEPOSITED	APY	DAILY	TVL	SAFETY
stETH/ETH CURVE (CONVEX)	0	0	9.77% +0.59%	0.0265% +0.0006%	\$12.96M	10.0 
LDO/ETH CURVE (CONVEX)	0	0	28.94%	0.0699%	\$27.616	9.4 
CLEV/ETH CURVE (CONVEX)	0	0	52.83%	0.1162%	\$10.66	9.1 
clevCVX/CVX CURVE (CONVEX)	0	0	21.14%	0.0525%	\$11.39	9.7 
yCRV/CRV CURVE (CONVEX)	0	0	33.99%	0.0802%	\$14,045	9.7 
TUSD/DAI/USDC/USDT CURVE (CONVEX)	0	0	3.88%	0.0104%	\$9.99	10.0 



Yearn Finance

Yearn Finance is a yield aggregator that automatically allocates users' funds to the highest-yielding DeFi protocols and liquidity pools. The platform is built on the Ethereum blockchain and is governed by its community of token holders. It operates through a suite of interconnected products and services, including Vaults, Earn, Zap, and Cover. Vaults are smart contract-based strategies that automatically allocate users' funds to the highest-yielding protocols, while Earn is a lending platform that allows users to earn interest on their stablecoin holdings. Vaults charge a 10% performance fee and a 2% management fee. Performance fees are split 50:50 between the Treasury and the Strategist, the official creator of the strategy. The management fee is assigned fully to the Treasury.



Featured Vaults				
Token	APY	Available	Deposited	TVL
Curve GEAR-ETH	113.56% BOOST 174x	0.00	0.00	\$ 541,319
Curve STG-USDC	48.55%	0.00	0.00	\$ 2,133,170
Staked yCRV	37.78%	0.00	0.00	\$ 29,242,599
Liquidity Provider yCRV	34.20% BOOST 204x	0.00	0.00	\$ 2,114,236
Curve 3Crypto	17.66% BOOST 250x	0.00	0.00	\$ 6,286,154
Curve stETH	4.51% BOOST 250x	0.00	0.00	\$ 15,139,280
USDT	3.57%	0.00	0.00	\$ 17,877,400

Risks of using Yield Aggregators

Traditionally, high rewards come with high risk and this is no different with yield farming.

1. *Smart Contract Risk:* Yield aggregators are built on top of smart contracts, which are self-executing computer programs. If there is a bug in the code or the smart contract is not properly audited, it could result in the loss of funds.
2. *Liquidation Risk*
3. *Yield farming projects can be a very high-risk, high-reward venture, and their underlying assets are often extremely volatile.*
4. *APY instability:* Market forces can lead to instabilities in the returns, making the advertised APYs unreliable.