

The DeFi Landscape

The Ethereum whitepaper indicates that “the first category is financial applications, providing users with more powerful ways of managing and entering into contracts using their money.” So far, decentralized finance (DeFi) has developed into an ecosystem with various applications built on multiple blockchains. The DeFi space has been growing at an astonishing pace. The total value locked (TVL) of DeFi protocols grew 132.85% from 274 to 638 million dollars in 2019, and explosively increased by 2910.97% to 19.21 billion dollars in 2020, and continued to reap a 1527.12% growth in 2021, reaching a whopping 312.57 billion dollars. In February 2022, the TVL of DeFi stayed at a high level of 250 billion dollars.

DeFi Summer

During the magnificent growing journey of DeFi, a notable episode is the 2020 DeFi Summer. In May 2020, Compound started to reward lenders and borrowers with its token COMP, leading to significant increases in the returns for liquidity providers. This inaugurated the wave of liquidity mining, which refers to earning newly minted tokens by providing liquidity, attracting countless investors and protocols to participate. Hence plenty of liquidity mining opportunities were presented to investors. This led to the rise of Yearn Finance, a protocol optimizing investor returns by automatically switching between protocols. This activity was termed yield farming and became another pulse of DeFi Summer. Later, Uniswap launched and airdropped its token UNI to every Ethereum address of historical users, in response to the emergence of yield farming and the challenge of its forked protocol Sushiswap. The freely airdropped tokens had an initial value of about 1000 dollars and a peak value of nearly 18000 dollars. This exciting reward immediately brought more investors to the DeFi space. Through the DeFi summer, the TVL of DeFi was lifted from one billion dollars to over 16 billion dollars. Liquidity mining, yield farming, and airdrop, as the legacies of DeFi Summer, remain active on the DeFi landscape.

DeFi Categories

All kinds of applications have been mushrooming on the DeFi landscape. Decentralized exchanges (DEXs), DEX aggregators, lending and borrowing protocols, yield aggregators, stablecoins, bridges, prediction markets, derivatives, and insurance are all integral to the DeFi society. The category with largest TVL is DEX led by Uniswap, which was built on the concept of liquidity pools and automated market makers. Uniswap’s cumulative traded volume crossed 800 billion dollars in February 2022, and it was forked by 222 protocols, whose TVL reached 73.2 billion dollars. Additionally, Initial DEX Offering (IDO) enables numerous projects to get financed without going through conventional financial intermediaries. The next four categories were Lending, Yield, Bridge, and Collateralized Debt Position with a TVL of 42.8, 21.7, 21.3, and 20.6 billion dollars, respectively.

DeFi on Multiple Chains

In addition to having multi-category applications, DeFi presents a trend of building on multiple blockchains. High demand of smart contract executions has led to high gas fee and congestion problem on Ethereum’s network. DeFi protocols started to resort to alternative blockchains with low gas fee and fast speed. In February 2022, the top five blockchains for DeFi protocols were Ethereum, Terra, Avalanche, Binance Smart Chain (BSC), and Fantom, whose TVL was respectively 151.0, 17.9, 16.5, 15.3, and 9.6 billion dollars. The market share of Ethereum was eaten up by competitive chains. Between January 2021 and February 2022, the dominance of Ethereum dropped from 96.81% to 60.23%. Terra’s share increased from 0.27% to 7.34%. Avalanche from 0 to 6.73%. BSC from 0.92% to 6.26%.

DeFi Infrastructures

The thriving of DeFi relies on its solid infrastructures, including oracles, cross-chain bridges, stablecoins, data aggregators, and so on. ChainLink builds decentralized oracle networks to provide reliable data feeds for the execution of financial contracts on blockchains. Since ChainLink's launch on mainnet in May 2019, its Total Value Secured (TVS) consistently increased and overtook Maker in June 2020 to become the crown of oracles. Further, its TVS reached 102.9 billion dollars in February 2022, dominating 66.1% of the whole oracle sector. Cross-chain bridges are also essential for the interoperability of DeFi. WBTC, a protocol bridging bitcoin to Ethereum's network as an ERC20 token, had a TVL of more than 10 billion dollars in February 2022. Stablecoins are also an integral part of DeFi infrastructures since they are pegged to the value of US dollar and facilitate on-chain transactions. In February 2022, the total market capitalization of stablecoins was over 180 billion dollars. And their total transaction volume in 2021 crossed a whopping five trillion dollars.

The Advantages of DeFi

Campbell Harvey (2022) emphasizes five problems of traditional finance that DeFi can solve: inefficiency, limited access, opacity, centralized control, and lack of interoperability. First, DeFi is based on reusable smart contracts and hence does not have the organizational burden of traditional finance. Keepers providing a service to DeFi protocols are compensated with market prices due to open competition. Also, public and forkable blockchain facilitates the competition to create the best smart contract platform and applications. Second, DeFi mitigates the flaw of limited access in traditional finance since it is permissionless. Yield farming provides users with the access to earning interest as well as having partial ownership of the platform. Third, DeFi protocols are run by smart contracts which are available to see on the blockchain. The terms of execution, the reward or penalty for staking, the total supply and inflation rate of a token are all transparent. Fourth, DeFi gives up the power of centralized control by making protocols transparent and immutable. Also, the ethos of decentralized autonomous organization (DAO) makes decentralized governance possible. Lastly, DeFi is interoperable so that users can build DeFi Legos by combining existing protocols into a new one. Incidentally, the tokenization of traditionally illiquid assets can unlock their possibilities of being integrated in DeFi services.

The Risks of DeFi

Although DeFi is full of growths and opportunities, it is also a land of risks. We have seen flash loans attacking the DeFi ecosystem, malicious IDO projects rug pulling unsophisticated investors, and Chinese government's outright ban on cryptocurrencies in September 2021. Campbell Harvey (2022) points out that DeFi is subject to multi-dimensional risks from smart contract, governance, oracle, scaling, DEX, custodial, environmental, and regulatory.

The Future of DeFi

Within a few years, DeFi has evolved into a multispecies and multi-chain ecosystem with trusted infrastructures. DeFi challenges the status quo of conventional finance and has various advantages over the legacy system. Meanwhile, the nascent DeFi space is faced by all kinds of risks and challenges. Nonetheless, numerous developers all around the world have been relentlessly building in the DeFi space, making innovations, and composing products. With evolving technologies and thriving DeFi communities, we are optimistic to see open finance happen in the future. Finally, we would like to conclude by echoing the statement in Campbell Harvey's book, "we see DeFi as the greatest opportunity of the coming decade and look forward to the reinvention of finance as we know it."