

THE DOOR TO A NEW WORLD: DECENTRALIZED FINANCE (DeFi)

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“If crypto succeeds, it’s not because it empowers better people. It’s because it empowers better institutions.”

– Vitalik Buterin, co-founder of Ethereum

WHAT IS DeFi ABOUT?

The world of crypto is fast-moving. An exciting development in this space is Decentralized Finance (“DeFi”), which entered the scene in March 2020, and its use has exploded ever since. The term refers to the offering of traditional financial services not by centralized players such as banks, insurance companies, and exchanges, but through smart contracts running on blockchains. In other words, central intermediaries are being replaced by an immutable computer code. If users indeed choose to go “bankless”, this could disrupt the world of finance as it is currently known.

WHAT ARE THE PROS AND CONS OF DeFi?

The advantages of DeFi include the following:

- Access to financial services around the clock and from anywhere in the world (no old-fashioned bank opening hours)
- Access to financial services without having to fulfill K.Y.C./A.M.L. requirements (no filling in paper forms and disclosing personal circumstances)
- Access to financial services offered in a non-discriminatory manner (nobody is excluded from using DeFi services, so that even previously “unbanked individuals” can open a bank account)
- Access to financial services without having to trust a counterparty (no risks resulting from mismanagement of a bank’s assets or fraudulent actions on the part of its employees)

The disadvantages of DeFi include the following:

- Risks of bugs in smart contracts (which can lead to a loss of assets deployed if the bugs are found by hackers)
- Certain technical skills are required of users (currently, a lack of user friendliness exists for DeFi)

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WHAT VOLUME HAS DeFi REACHED?

As of early March 2022, the DeFi ecosystem had a volume of approximately U.S. \$209 billion.¹ This figure refers to the value of assets locked in smart contracts (total value locked, or “T.V.L.”). While this is literally nothing compared to traditional finance, the growth rate of T.V.L. is exponential. Exponential growth of that magnitude is a typical sign of disruptive tech.

ON WHICH BLOCKCHAINS DOES DeFi RUN?

Blockchains are a kind of infrastructure used to run smart contracts. In the realm of DeFi, smart contracts mostly run on Ethereum (54% of T.V.L.), followed by Terra (11% of T.V.L.), BNB Chain (6% of T.V.L.), Avalanche (5% of T.V.L.) and Fantom (5% of T.V.L.). While the future is probably “multi-chain” (rather than “one chain to rule them all”), Ethereum will likely continue to capture a large part of market share, in particular due to network effects. One of the buzzwords of DeFi is “money lego”, meaning that various DeFi applications can be put together like LEGO bricks. Composability in turn requires DeFi apps to reside on the same blockchain, making it advantageous to be on the Ethereum blockchain. However, while blockchains were traditionally unconnected islands, they are becoming more and more interconnected through so-called bridges.

WHAT ARE STABLECOINS?

Crypto assets are extremely volatile. Although the top two – Bitcoin with a market share of 41% and Ether with a market share of 17% – are considered “conservative” assets, even they have often experienced double-digit drawdowns within a 24-hour timeframe.² Taking the volatility into account, it makes no sense to invest crypto assets in DeFi protocols with a view to generating say an annual 10% yield, if there is a risk that the capital invested will depreciate by 10% within the next day. Enter stablecoins: these are crypto assets without volatility, pegged to a fiat currency such as the U.S. Dollar. These are ideal assets for the usage in DeFi.

There exist three different types of stablecoins:

- Fiat collateralized stablecoins, such as Tether (“USDT”), TrueUSD (“TUSD”), Binance USD (“BUSD”), USD Coin (“USDC”), Pax Dollar (“USDP”), and Gemini Dollar (“GUSD”)
- Crypto collateralized stablecoins, such as Dai (“DAI”), mStable USD (“MUSD”), Magic Internet Money (“MIM”), and Frax (“FRAX”)
- Not-collateralized stablecoins, such as Ampleforth (“AMPL”)

Fiat collateralized stable coins are easy to understand but rely on a hopefully trustworthy intermediary who holds the collateral (U.S. Dollars) and issues stable coins against the collateral deposited. The most important representative by far of this category is Tether (“USDT”). Crypto collateralized stablecoins are more complex to understand but get rid of intermediaries and are thus truly decentralized. In stress

¹ See <https://defillama.com>.

² Investors in crypto need nerves of steel, or they die a premature death.

situations, crypto collateralized stablecoins might not be able to hold the peg at all times. Not-collateralized stablecoins are an interesting monetary experiment utilizing an elastic money supply.

WHAT CATEGORIES OF DeFi EXIST?

DeFi is slowly but surely replicating all services being offered in traditional finance. Currently, the five most important categories of DeFi comprise the following:

- Decentralized savings deposits and loans
- Decentralized insurance
- Decentralized derivatives
- Decentralized investment funds
- Decentralized exchanges

The following discussion provides examples for each category.

Decentralized Savings Deposits and Loans

Compound³ is an example of a decentralized marketplace for capital. Lenders can lend crypto assets, thereby earning interest, and borrowers can borrow crypto assets, thereby paying interest. Lending and borrowing does not take place between individual users. Rather, lenders lend directly to the platform and borrowers borrow directly from the platform. Thus, this is not peer-to-peer, but peer-to-protocol lending and borrowing. The protocol functions like a bank, earning interest spread.

On Compound, possible crypto assets for lending and borrowing include the stablecoins Tether (“USDT”), TrueUSD (“TUSD”), USD Coin (“USDC”), Pax Dollar (“USDP”), and Dai (“DAI”), but also volatile crypto assets such as Ether (“ETH”) and Wrapped Bitcoin (“WBTC”). The applicable interest rates depend on the crypto asset concerned and are algorithmically determined by supply and demand, with rates changing constantly. Interest rates are stated as Annual Percentage Yields (“APY”), and interest is settled every block, which is every 15 seconds. At the time of writing, yields on stable coins were between 1.61% and 2.99% – which is a far cry from the typical yields on bank accounts. Lending and borrowing are extremely flexible, there exist no maturities: deposits can be withdrawn, and loans can be repaid at any time.

In order to borrow crypto assets, collateral exceeding the loan amount must be provided, e.g., to the extent of 150%. This over-collateralization is a necessary consequence of the pseudonymous nature of the blockchain and the resulting lack of a possibility to determine a borrower’s creditworthiness.

Compound has several competitors: noteworthy other names include AAVE,⁴ which offers a slightly larger menu of crypto assets that can be deposited and borrowed, and Anchor,⁵ which offers only one single stablecoin and at the time of writing had a

³ See <https://app.compound.finance>.

⁴ See <https://app.aave.com/#/markets>.

⁵ See <https://app.anchorprotocol.com/earn>.

whopping deposit interest rate of 19.46% p.a. Notional⁶ allows for fixed-rate borrowing and BarnBridge⁷ offers fixed-rate deposits.

Decentralized Insurance

DeFi is based on crypto assets locked in smart contracts. In the event of programming errors in the smart contract, there is a risk of losing the capital invested. It is possible to insure against this risk, for example, with the application Nexus Mutual,⁸ a kind of mutual insurance company. As of early March 2022, 115 different insurance contracts are being offered that provide protection against bugs in a protocol or against risks with centralized exchanges or custodial wallets. Premiums start at 2.6% p.a. for low-risk projects. For example, to insure 100,000 Dai (“DAI”) invested in AAVE over a period of one year, a payment of exactly 2,600 Dai was required as a form of insurance premium. Interestingly, on Nexus Mutual, insurance coverage can be obtained without crypto assets locked in the insured smart contract; this is of course different with traditional insurance. In addition to policyholders, there are also investors who provide risk capital to the protocol and receive compensation in return, in the form of premiums. If the insured event occurs, the protocol makes the insurance payment from these funds provided.

Nexus Mutual has a number of competitors: Unslashed⁹ is a decentralized insurance platform on Ethereum that offers 25 different insurance products. InsurAce¹⁰ is a similar solution that offers protection for 114 DeFi applications on 16 different blockchains. Armor¹¹ is a kind of insurance broker on Ethereum: instead of having to procure decentralized insurance protection for various DeFi applications on different blockchains individually and to constantly adjust the policies, Armor can be used to dynamically adjust the insurance protection as an investor moves across different platforms.

Decentralized Derivatives

Mirror Protocol¹² is a platform for decentralized derivatives on which synthetic assets can be created and traded. Shares such as Alphabet, Apple, Airbnb, Advanced Micro Devices, Amazon.com, Alibaba, Coinbase, Facebook, Goldman Sachs, Robinhood, Johnson & Johnson, Coca-Cola, Microsoft, Netflix, NVIDIA, PayPal, Starbucks, Square, Tesla and Twitter can be purchased in the form of an ERC-20 token. An ERC-20 token is an asset on the Ethereum blockchain which can be sent and received. The above-mentioned tokens can be traded 24/7 and can be held directly in a crypto wallet without having to trust an intermediary like a bank. A competitor of Mirror Protocol is UMA,¹³ which offers similar functionality.



⁶ See <https://notional.finance>.

⁷ See <https://app.barnbridge.com>.

⁸ See <https://app.nexusmutual.io/cover>.

⁹ See <https://app.unslashed.finance/cover>.

¹⁰ See <https://app.insurace.io/Insurance/BuyCovers>.

¹¹ See <https://armor.fi/protect>.

¹² See <https://mirrorprotocol.app/#/trade>.

¹³ See <https://umaproject.org>.

Decentralized Investment Funds

Set Protocol¹⁴ is a DeFi application on Ethereum through which one can buy or sell Sets. A Set is a decentralized investment fund whose composition of crypto assets is managed automatically. The Sets are designed in the form of an ERC-20 token and embody the underlying crypto assets. Sets can be held directly in a wallet without an intermediary. Investors are not subject to any minimum investment amounts.

Index Coop¹⁵ is a decentralized provider of various crypto indices. Important indices are, for example, the DeFi Pulse Index or the Metaverse Index. These indices enable an efficient investment in a basket of tokens.

Enzyme Finance¹⁶ is a decentralized asset management platform. Asset managers can set up investment funds quickly and easily based on their investment strategies. They can also determine a specific fee structure. There is full transparency regarding the development in value of the funds and the crypto assets they hold. There exist currently around 100 funds to choose from.

Decentralized Exchanges

One of the most important categories of DeFi is the decentralized exchange (“DEX”). With a DEX, there is no central operator, such as Coinbase or Kraken, who holds the crypto assets in question and who must therefore be trusted as there is counterparty risk. Instead, smart contracts are used: if you send a certain amount of Ether to an Ether/USDC smart contract, you automatically get back the equivalent in USDC, and vice versa. Nobody holds your crypto assets, and accordingly, no one can run away with your crypto assets. On a DEX, anyone can list a new trading pair, while on a traditional exchange, a listing is subject to a decision by the exchange, sometimes only possible upon payment of a listing fee, and can also be revoked. Also, trading fees on a DEX accrue to the liquidity providers, while on a traditional exchange, they accrue to the operator alone. In addition, KYC/AML provisions are not applied on DEXes, while these may be applicable on a traditional exchange. Initially, tokens were listed on traditional exchanges and then gradually on DEXes. Now, the reverse is true. Projects list their tokens on a DEX, which is easier and cheaper, and if they are successful, the tokens eventually come to the traditional exchanges. Historically, the first example of a DEX was Uniswap.¹⁷ Beginning early in March 2022, U.S. \$7.5 billion of liquidity was available there in a wide variety of trading pairs. Other well-known examples of DEXes are Curve (U.S. \$19.9 billion T.V.L.)¹⁸ and SushiSwap (U.S. \$3.9 billion T.V.L.).¹⁹

WHAT ABOUT REGULATORS?

Apps in the field of DeFi will often engage in regulated activities, such as deposit-taking, lending, or insurance businesses, without complying with the current need

¹⁴ See <https://www.tokensets.com/explore>.

¹⁵ See <https://app.indexcoop.com>.

¹⁶ See <https://app.enzyme.finance>.

¹⁷ See <https://uniswap.org>.

¹⁸ See <https://curve.fi>.

¹⁹ See <https://app.sushi.com/en/swap>.

for obtaining a license. The question arises as to whether such noncompliant apps could simply be switched-off by a regulator or whether they are so far decentralized that regulators are powerless to intervene. Here it is necessary to distinguish

- the underlying smart contract runs on a blockchain that normally cannot be stopped; and
- the corresponding website of the DeFi application, which is the frontend, can be shut-down. Ultimately, however, this will not be a successful move: because the website is an interface, anyone can build a new interface that accesses the same unstoppable smart contract in the background, often by simply copying the publicly available code.

WHAT COMES NEXT?

DeFi is one of the most interesting applications of blockchains and smart contracts.²⁰ We have opened the door to DeFi for you, now it is up to you to enter.²¹

“DeFi is one of the most interesting applications of blockchains and smart contracts. We have opened the door to DeFi for you, now it is up to you to enter.”

²⁰ Other interesting applications are Non-Fungible Tokens (“N.F.T.’s”) and Decentralized Autonomous Organizations (“D.A.O.’s”).

²¹ For more information please see [this webinar](#).

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