



# DEFI: REDEFINING THE FUTURE OF FINANCE

APRIL 2021





# WHAT IS DEFI?

It is difficult to imagine the future of finance without the traditional financial intermediaries we rely upon today. But the emerging area of decentralized finance (DeFi) has the potential to upend the entire financial ecosystem as we know it. DeFi offers global, inclusive financial service improvements with incomparable enhancements in speed, cost, and accessibility. DeFi opens up entirely new possibilities for economies and individuals worldwide.

DeFi is a global, open alternative to traditional financial services. Advancements in blockchain technology are empowering DeFi developers to recreate the architecture of legacy financial systems with a code-based digital infrastructure of DeFi apps and protocols. These apps and protocols replicate traditional financial functions such as borrowing, lending, and exchanging assets, and they do so in a permissionless manner without relying on traditional financial intermediaries.

This move away from traditional financial intermediaries is revolutionary. As usage of DeFi apps and protocols surpasses all-time highs again and again, the disruptive nature of DeFi is attracting savvy investors looking to be part of the revolution. Compared to traditional financial markets, the yields of the digital assets being borrowed, lent and exchanged on DeFi apps are very high. Moreover, with new technological advancements come new ways of generating returns. DeFi is creating brand new opportunities in the areas of spot borrowing and lending, call overwriting, yield farming, and liquidity mining.

DeFi is built primarily on the Ethereum blockchain. The Ethereum blockchain was launched in 2015 as a technology that built on bitcoin's innovation, with some key differences. Both the Bitcoin and the Ethereum blockchains allow users to transact with digital value

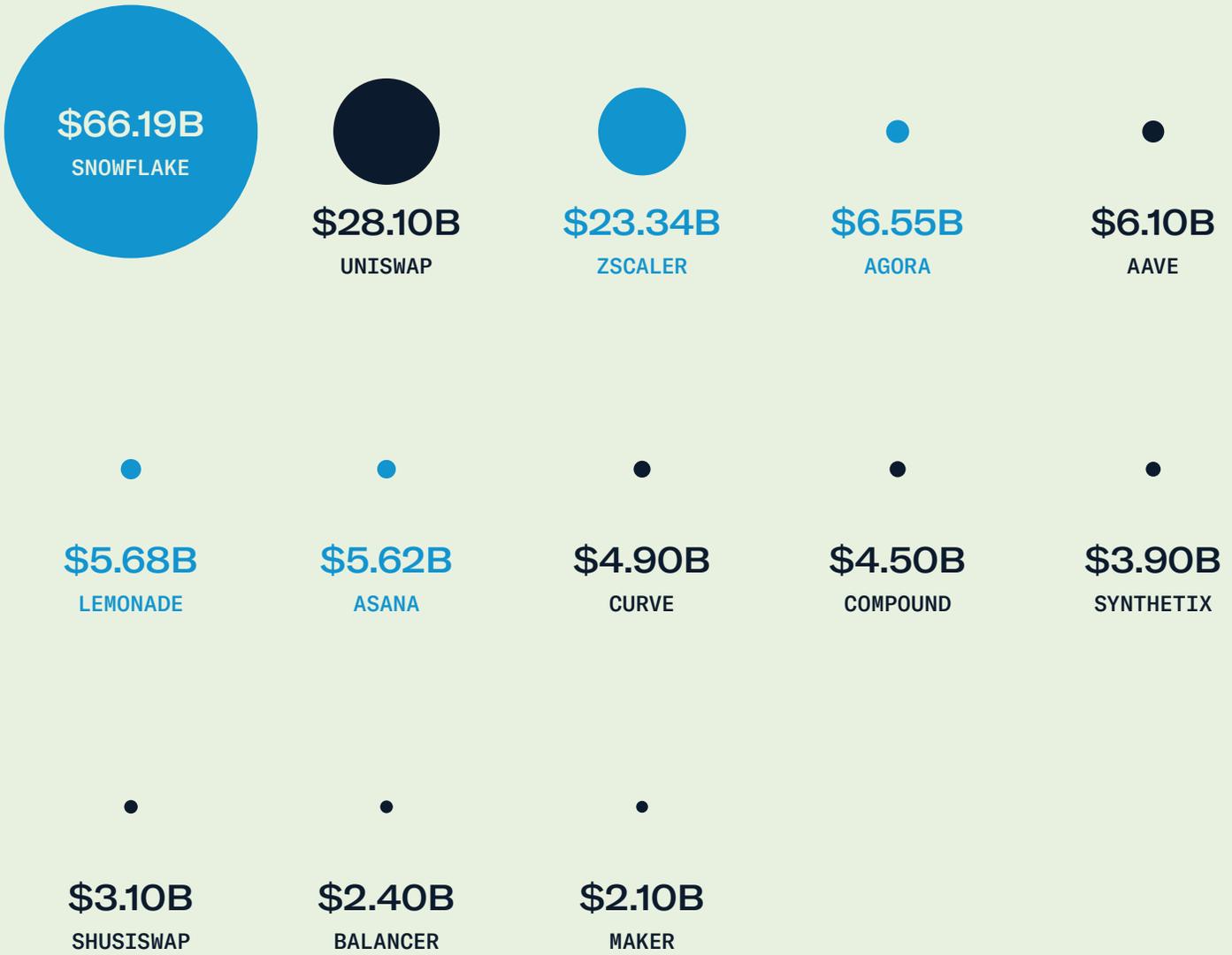
without payment providers or banks. But Ethereum's general programmability goes far beyond the Bitcoin blockchain's simple balance transfers. Ethereum is the world's first programmable blockchain, which is to say all value is programmable. "Smart contracts" implement if/then logic into assets themselves; they are like computer programs running on the blockchain that can execute automatically when certain conditions are met. Ethereum introduces this into every asset, and in doing so, it significantly expands the world's choices for interacting with money.

You'll often hear DeFi apps, built on the Ethereum blockchain, referred to as "killer apps." In order to be a "killer app," the app must be both disruptive and widely adopted. DeFi protocols and applications utilize Ethereum's smart contracts. They're powered by native digital assets that operate as built-in incentive mechanisms. These digital assets have been increasingly attracting attention since DeFi's explosion in mid-2020, with some touting market caps that rival those of fast-growing tech startups.

One of the unique features of DeFi is that all of these projects can use and leverage each other, a trait commonly referred to in the community as "composability." More importantly, other developers can use all of these when they build their own products. This level of permissionless interoperability is significant to the continued growth of the entire space. That said, all of this interoperability is enabled because these projects build on Ethereum. Composability is currently only possible between projects that operate within the same blockchain ecosystem, such as Ethereum, and becomes increasingly difficult when trying to communicate between two different blockchains. While other blockchains are making efforts to bring forward DeFi applications, the DeFi ecosystem originally developed on Ethereum. Thus, DeFi is still mostly confined to Ethereum.



MARKET CAP OF PROTOCOLS VS. SELECT RECENTLY-PUBLIC TECH CO'S



● RECENTLY-PUBLIC TECH COMPANY ● CRYPTO PROTOCOL

Source: Galaxy Digital Research as of March 2021



# FOUNDATIONAL PLAYERS IN DEFI

Several key DeFi players have set the stage for the current DeFi ecosystem by contributing significant innovations. The DeFi space moves quickly, but gaining an understanding of these innovators is a great place to start.

The first notable DeFi platform is MakerDAO. This project introduced the first decentralized stablecoin called DAI. Here's how it worked. Users deposited an amount of Ether (ETH) into a smart contract. Ether, commonly referred to as "Ethereum," is the cryptocurrency that powers the Ethereum blockchain. Then they were allowed to mint an amount of DAI capped at 66% of the value of their deposited ETH. In doing so, users were taking an over-collateralized loan of DAI, using ETH as collateral. The system has since expanded, allowing for the use of other collateral assets. There is \$7.4B in capital locked up in Maker loans.<sup>1</sup> Maker was the first Peer-to-Contract network to gain traction, but Compound took things a step further.

Compound is a money market protocol that allows users to deposit crypto assets into smart contracts that pool assets and earn a yield while being borrowed. Borrowers can pull from the pool by depositing collateral and withdrawing up to 75% in another asset (or less, depending on the collateral). Compound was unique because suppliers/lenders were consistently earning a variable yield so long as there was at least a single borrower. The yield varied based on how much of the total lending capacity was utilized. This was a step-function improvement in DeFi lending as borrowers and lenders no

longer needed to be matched on a one-off basis (i.e., a peer-to-peer lending market or an order book). Instead, anyone could borrow from a lending pool if they were comfortable with the rates and had the required collateral. Compound has over \$15B worth of cryptocurrency available for borrowing and currently dominates the market with about 19% of the total value locked up across all of DeFi.<sup>2</sup>

Uniswap was another step-function improvement in DeFi. Just as Compound changed DeFi lending, Uniswap pioneered the "Automated Market Maker" model (AMM). This model allows traders to instantly fill market orders against a pool of capital, giving them the flexibility to swap between any Ethereum-based assets at any time and in a permissionless manner. Uniswap (and AMMs in general) is enabled by liquidity providers. Liquidity providers are users who act as market makers by depositing assets into a liquidity pool which can then be used to facilitate trading by others. Liquidity providers then earn a pro-rata share of trading fees collected by the pool. Uniswap's popularity exploded among decentralized exchanges in the last 6 months. It has processed more than \$100B in trading volume since it launched in early 2019.<sup>3</sup>

The rise of DeFi has been in the making for some time. At the start of 2020, the entire DeFi industry was worth just \$1B. As of 3/31, it was worth nearly \$47B.<sup>4</sup> The DeFi industry's initial boom was due to Compound's launch in mid-June 2020, and the widespread utilization of a new incentive scheme referred to as Liquidity Mining, or "Yield Farming."

1) Source: [DeFi Pulse](#), as of 3/31/21

2) Source: [Decrypt.co](#), as of 4/4/21

3) Source: [Decrypt.co](#), as of 2/15/21

4) Source: DeFi Pulse



# LIQUIDITY MINING AND TOKEN DISTRIBUTION

What is Liquidity Mining? A number of DeFi protocols, led by Compound, have started rewarding the protocol users with their own tokens. One way to think about these rewards is like mining rewards in Proof of Work systems. Since Compound's token was launched, the protocol has been rewarding users with COMP tokens. Users earn a pro-rata share of tokens based on how much they borrow or lend. This provides an additional yield to users, such that actively participating in a protocol now produces a yield denominated in the protocol's token (although some may provide yield in ETH or other tokens). This additional yield created the initial "yield farming" craze, as the prevailing yields exceeded 30% (annualized). Simply put, users were able to realize double digit annual yields by lending or borrowing crypto assets, including Stablecoins. Stablecoins are digital assets created to act as a unit of account or store of value, typically by being pegged to a fiat currency such as the U.S. dollar.

But what are these tokens? Often they are "Governance Tokens." In most cases, Governance Tokens are tokens that allow the holder to vote on changes to the protocol, or to delegate their vote to someone else (similar to a proxy advisor). However, many of these networks generate cash flows. Simply put, the ability to vote on protocol changes is the ability to vote on how the protocol accrues value or how it directs those cash flows.



# DEFI EXPANDS

While there are too many DeFi projects to count, the following all deserve acknowledgement.

Aave, formerly known as ETHLend, is a money market protocol that preceded Compound. Aave initially struggled to gain traction. However, the larger DeFi ecosystem warmed to subsequent innovations. Aave introduced Flash Loans, an innovation with no exact parallel in traditional finance. In some ways, Flash Loans are similar to overnight borrows. Flash Loans allow a user to borrow assets from an Aave pool without collateral, but the loan must be repaid in the same transaction it is borrowed. This process may seem strange. Why would one want to borrow and repay in the same transaction? Considering a single Ethereum transaction can perform many tasks, Flash Loans become more appealing. For example, a user may take a Flash Loan to borrow \$1M, use that \$1M to conduct a series of trades, say, close an arbitrage opportunity, and repay the \$1M after they have performed the trades. All of this can happen in a single transaction. Flash Loans open the door for unique arbitrage opportunities. Now, anyone can obtain the capital needed to take advantage of these opportunities so long as they can execute their trade in a single transaction.

Synthetix is a platform that allows users to mint synthetic assets. These represent anything from synthetic short positions, leveraged positions, commodities, and ultimately any asset that has a reliable price feed. Synthetix initially started by enabling users to mint representations of other tokens, notably ones that gave synthetic short exposures. Since then, the protocol has added synthetics that give exposure to commodities and the foreign exchange market, and the platform is likely to add additional asset classes. Anyone can mint these assets and become eligible to receive trading fees paid by those who trade the synthetic assets. There are over \$2.3B of assets locked by the Synthetix protocol, and daily trading volume in Synths, the synthetic assets of the protocol, hovers around \$100M per day.

Balancer is a new breed of AMM that lets users create a unique portfolio of assets and give others exposure to it. Each portfolio is leverageable as a source of market liquidity similar to Uniswap. Balancer expanded on Uniswap by allowing several assets into a liquidity pool, replacing the Bonding Curve design with a Bonding Surface.

Curve is an AMM that was purpose-built for the trading of Stablecoins. It employs a similar methodology to Balancer (the founder started on the Balancer team), which uses Bonding Surfaces. However, since it only allows Stablecoins, its design allows for much lower price slippage than most AMMs. Curve has become one of the most popular ways to trade in and out of Stablecoins.



Keep Network enables bitcoin holders to create a tokenized or synthetic version of bitcoin on Ethereum. This workaround grew in popularity alongside Liquidity Mining as it now allows bitcoiners to earn yield on their holdings without having to work with custodial lenders.

Chainlink is a decentralized Oracle network that provides real-world data to smart contracts. LINK tokens are the digital asset tokens used to pay for services on the network. LINK tokens allow Ethereum developers to incorporate data into their smart contracts (the software they deploy on Ethereum). This data can be anything, but let's consider price feeds for example. Any service that allows data from the outside world to come "on-chain"

is something we call an Oracle. There is a massive need to incorporate off-chain data into on-chain smart contracts. This is a major problem that the industry refers to as the "Oracle Problem." Inherently, a blockchain only knows what happens inside of the blockchain. It does not have any ability to verify data outside of the blockchain. So data input from outside of the chain, or "off-chain" data, doesn't have the same "trustless-ness" as native data. One might say, "I can trust that the balances in my Ethereum wallet are correct, because those are verified through the Proof of Work consensus process. But, if I incorporate a price feed into Ethereum, I'm now trusting whomever it is that is procuring that feed." Chainlink attempts to solve this by establishing an Oracle protocol.

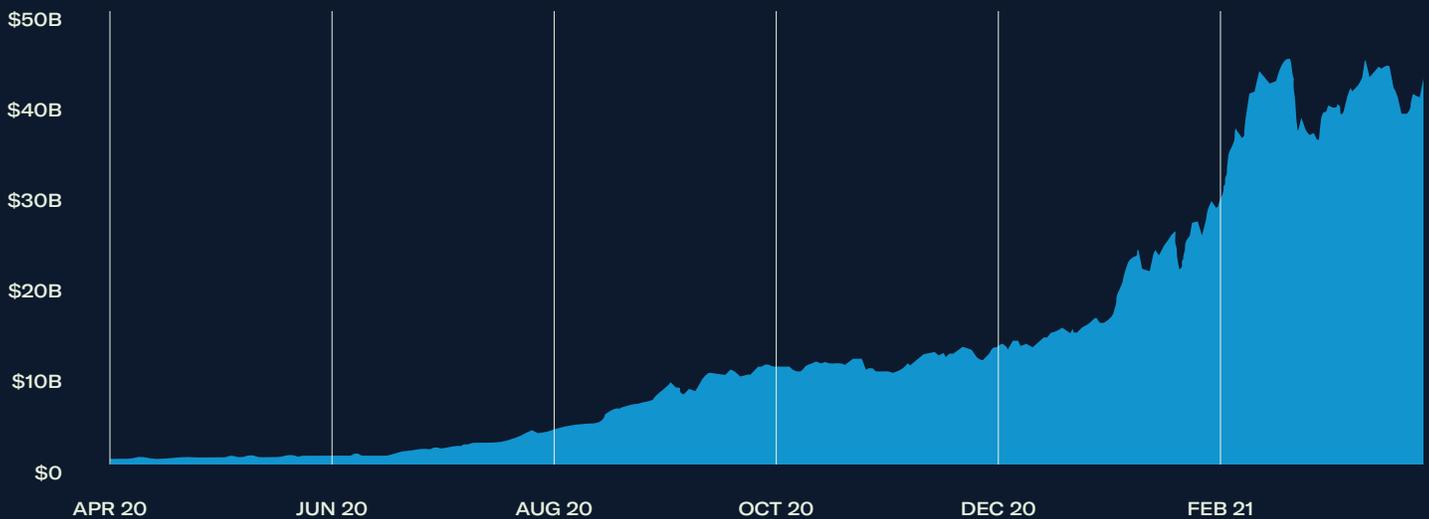


# THE FUTURE OF DEFI

One of the most popular measures of DeFi's progress is Total Value Locked (TVL), the amount of assets that are currently staked within DeFi protocols. DeFi has made incredible strides over the last year. Evidence of the power and influence of DeFi is plainly visible considering the TVL has tripled over Q1 of 2021. DeFi protocols and networks are poised to capture significant value and appreciate, leading to index and basket product prices rising over time. The generation of heightened demand by institutional hedge funds, OTC desks, market makers, and liquidity providers towards DeFi demonstrates this movement's longevity.

The ethos of Decentralized Finance has far-reaching and revolutionary implications. DeFi is actively innovating to rebuild the current financial infrastructure in a way that is not only faster and more cost-efficient but also fully transparent. This is a future where transaction settlement is not only instant but openly verifiable and one in which counterparty risk is significantly mitigated. This is the future of finance.

TOTAL VALUE LOCKED (USD) IN DEFI (AS OF MARCH 31, 2021)



Source: DeFi Pulse



# GALAXY FUNDS RISK FACTORS

Please note that the following are not all the risk factors associated with Digital Assets or the Funds (each, a “Fund”). Refer to the Offering Memorandum of the applicable Fund for more risk factors.

**Investment Risks Generally.** An investment in the Fund, involves a high degree of risk, including the risk that the entire amount invested may be lost. The Fund will invest in Digital Assets (such as Bitcoin, Ethereum, other cryptocurrencies or blockchain based assets, including those that represent the Decentralized Finance (or DeFi) portion or sector of the digital assets market) using strategies and investment techniques with significant risk characteristics, including risks arising from the volatility of the global Digital Assets markets and the risk of loss from counterparty defaults. The Fund’s investment program may use investment techniques that involve substantial volatility and can, in certain circumstances, substantially increase the adverse impact to which the Fund may be subject. All investments made by the Fund will risk the loss of capital. No guarantee or representation is made that the Fund’s investment program will be successful, that the Fund will achieve its investment objective or that there will be any return of capital invested to investors in the Fund, and investment results may vary.

**Different from Directly Owning Bitcoin, Ethereum or Other Digital Assets.** The performance of the Fund will not reflect the specific return an investor would realize if the investor actually purchased a Digital Asset. Investors in the Fund will not have any rights that Digital Asset holders have.

**No Guarantee of Return or Performance.** The obligations or performance of the Fund or the returns on investments in the Fund are not guaranteed in any way. Any losses of the Fund will be borne solely by investors in the Fund. Ownership interests in the Fund are not insured by the Federal Deposit Insurance Corporation, and are not deposits, obligations of, or endorsed or guaranteed in any way, by any banking entity.

**Regulation.** Digital Assets, including Bitcoin, Ethereum and DeFi tokens, are loosely regulated. Ongoing and future regulatory actions may alter, perhaps to a materially adverse extent, the value of a Fund’s investment. If any Digital Asset is determined to be a “security” under U.S. federal or state securities laws or a Digital Asset exchange is determined to be operating illegally, it may have material adverse consequences for Digital Assets due to negative publicity or a decline in the general acceptance of Digital Assets. As such, any determination Digital Asset exchanges are operating illegally or that any Digital Asset is a security under U.S. federal or state securities laws may adversely affect the value of a particular Digital Asset or Digital Assets generally and, as a result, the value of a Fund’s investment.

**Exchanges.** Exchanges may suffer from operational issues, such as delayed execution, that could have an adverse effect on the Fund. Digital Asset exchanges have been closed due to fraud, failure or security breaches. Any of the Fund’s funds that reside on an exchange that shuts down or suffers a breach may be lost.

**Value.** Several factors may affect the price of Digital Assets, including Bitcoin, Ethereum and DeFi tokens, including, but not limited to: supply and demand, investors’ expectations with respect to the rate of inflation, interest rates, currency exchange rates or future regulatory measures (if any) that restrict the trading of a Digital Asset or the use of a Digital Asset as a form of payment. There is no assurance that a Digital Asset will maintain its long-term value in terms of purchasing power in the future, or that acceptance of bitcoin payments by mainstream retail merchants and commercial businesses will continue to grow.

**Protocol.** Many Digital Asset networks, including Bitcoin, Ethereum and DeFi tokens, operate on open-source protocols maintained by groups of core developers. The open-source structure of these network protocols means that certain core developers and other contributors may not be compensated, either directly or indirectly, for their contributions in maintaining and developing the network protocol. Lack of incentives to, or a failure to properly, monitor and upgrade network protocol could damage a Digital Asset network. It is possible that a Digital Asset protocol has undiscovered flaws that could result in the loss of some or all assets held by the Fund. There may also be network-scale attacks against a Digital Asset protocol, which could result in the loss of some or all of assets held by the Fund. Advancements in quantum computing could break a Digital Asset’s cryptographic rules. The Fund makes no guarantees about the reliability of the cryptography used to create, issue, or transmit Digital Assets held by the Fund.

**Volatility & Supply.** Values of Digital Assets have historically been highly volatile, experiencing periods of rapid price increase as well as decline. For instance, there were steep increases in the value of certain Digital Assets, including Bitcoin, over the course of 2017, and multiple market observers asserted that digital assets were experiencing a “bubble.” These increases were followed by steep drawdowns. During the period from December 17, 2017 to February 5, 2018, Bitcoin experienced a decline of roughly 60%. More recently, during the period from February 13, 2020, until March 16, 2020, the value of Bitcoin fell by over 50%. Supply of Digital Assets is determined by computer code, not by a central bank. For example, uncertainty related to the effects of Bitcoin’s recent and future “halving” could contribute to volatility in the Bitcoin markets. The value of the Bitcoin or other Digital Assets held by a Fund could decline rapidly in future periods, including to zero.

**Decentralized Finance (DeFi) Risks.** Decentralized Finance (or DeFi) refers to a variety of blockchain-based applications or protocols that provide for peer-to-peer financial services using smart contracts and other technology rather than such services being offered by central intermediaries. Common DeFi applications include borrowing/lending Digital Assets and providing liquidity or market making in Digital Assets. Because DeFi applications rely on smart contracts, any errors, bugs, or vulnerabilities in smart contracts used in connection with DeFi activities may adversely affect such activities. DeFi lending is subject to counterparty risk and credit risk, but because lending is automated through the DeFi protocol, rather than individual decisions made by a portfolio manager on behalf of a Fund, such risks may be exacerbated, particularly if there are flaws in DeFi protocol’s code or operation. DeFi applications may involve regulated financial products or regulated activities, however because of their decentralized nature, there is generally no entity subject to regulatory supervision. Accordingly, DeFi applications may be subject to more risks than engaging in similar activities through regulated financial intermediaries. In addition, in certain decentralized protocols, it may be difficult or impossible to verify the identity of a transaction counterparty necessary to comply with any applicable anti-money laundering, countering the financing of terrorism, or sanctions regulations or controls. All of these risks could cause the value of DeFi tokens held by a Fund to decline, including to zero.



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