INTRODUCTION TO ETHEREUM'S DAPPS —DEEP DIVE INTO AAVE

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This is the first blog post in a series about Ethereum's blockchain applications.

Ethereum's recent popularity is driven by the growth of decentralized applications, called dApps. Among dApps, decentralized financial systems (DeFi) constitute one of the most prominent areas of development.

The goal with DeFi is to create an alternative to traditional financial systems by being open, transparent and available to anyone with access to the Internet.

One of the most popular DeFi applications is Aave. It is a decentralized protocol that allows users to lend and borrow cryptocurrencies.

As the number of users and the volume of transactions on the Aave platform have surged, its native token, AAVE, saw a 642% price increase, from $56.16 to $360.36[1].

What does Aave do?

Aave is an open-source, non-custodial protocol that uses liquidity pools to facilitate lending and borrowing of crypto assets. Users can earn interest with deposits or take out loans by using those deposits as collateral. Currently, there are 28 supported tokens on Aave, with over $14 billion in assets locked up[2].

Stani Kulechov, the founder of Aave, launched the initial coin offering, then called ETHLend, in 2017. In 2018, the name was changed to Aave, which is Finnish for "ghost," to reflect the platform's transparent policies. The rebrand also coincided with a switch from a peer-to-peer lending model to a pool-to-peer model. Below, we will cover several of Aave's main functionalities.

Depositing and Borrowing

When users deposit cryptocurrencies into Aave, new temporary tokens are minted, called aTokens. For example, if a user deposits ether tokens, they will receive equally valued aEth tokens–"Eth" for "ether." These aTokens peg to the value of the underlying token.

This allows Aave to be non-custodial, as Aave is never in control of an individual's crypto tokens. When lenders want to make a withdrawal, they need to trade the aTokens back for their original tokens. Aave then destroys the lender's aTokens. While lenders own aTokens, they receive interest paid by Aave, and can use those aTokens as collateral for loans. ATokens can also be traded on different crypto exchanges, so can be sold to to someone else (independent of Aave). ATokens would still need to be bought back to withdraw the original tokens.

Because of the volatility of cryptocurrencies, Aave loans tend to be overcollateralized; to take a loan of $500, users will need more than $500 as collateral. Depending on the token, borrowing interest rates can vary from 0.02% APY to over 12% APY[3]. The rate is variable, and changes based on supply and demand of the specific token within Aave's liquidity pool, determined by a formula programmed into the Aave smart contract. Aave also allows users to borrow at a stable rate, although stable rates could be much higher.

Aave also allows for **credit delegation**. If users don't have enough collateral for a

loan, they can ask another user to privately delegate the credit. The borrower pays additional fees to the delegator, and the delegator earns additional interest on top of the interest earned by just depositing.

Many users simply deposit money in Aave to earn passive income, taking advantage of the high interest rates. Depending on the token, interest is earned as the original token or the aToken.

Flash Loans

Aave's most distinctive functionality, compared to other lending dApps, is its flash loans. A flash loan is an uncollateralized loan that allows a user to borrow cryptocurrencies for a very short time—within one transaction. A typical loan, however, takes longer and requires collateral to be staked.

Aave achieves the flash loan concept by relying on blockchain technology. In a blockchain, new transaction information is appended as a block. For the flash loan, if the initial amount and borrowing fees are returned by the end of the transaction, the flash loan takes place and the transaction is recorded. If the transaction doesn't take place, the entire loan is taken back and cancelled, as if it never happened.

One use case for flash loans is arbitrage. Cryptocurrencies can be priced differently on different exchanges, so users can borrow at one price and immediately sell to another exchange at a higher price. Aave's flash loan garnered interests and hit $1 billion in total volume in February 2021.

Aave and Other Lending Protocols

The two largest competitors to Aave are Compound and MakerDAO. Overall, the structures of all three are very similar, using a decentralized, open-source, non-custodial liquidity pool model, with their main differences being the way interest is paid and how interest rates are calculated. Aave rose to be more popular than the others due to its flash loans, and now has the most total value locked in the protocol.

Aave's Future

Aave is gaining more users, and the total amount of assets on the platform has spiked. Aave is also the largest lending protocol and AAVE is one of the most popular tokens that can be purchased on Coinbase. While it is undeniable that cryptocurrencies' mainstream attention has led to higher prices, one might argue that Aave's success cannot be attributed just to hype. Aave has continued to improve and develop, pioneering new functions like its flash loans.

Currently, Aave is working on a new platform, Aave Arc, with the goal of being a gateway to decentralized finance for institutions. It will still use the same liquidity pool model but will be stricter about who can join, to lower credit risk. It will allow users who pass certain qualifications to enter a private liquidity pool, as opposed to the public pool available now.

Conclusion

DApps like Aave represent an interesting use case for Ethereum. Aave is a protocol built on the Ethereum blockchain, where smart contracts run and execute. The native tokens for dApps, like the AAVE token and aTokens, use the Ethereum blockchain for transactions. More and more dApps are being built and used, adding to the potential for continued growth on Ethereum. DApps are some of the best examples of both the potential for value to be derived via Ethereum and how it is unique from Bitcoin.

[1] CoinGecko, from 10/02/20–8/8/21.

[2] Defi Pulse, 8/8/21. Total Value Locked refers to the number of assets that are currently being staked in a specific protocol, from https://coinmarketcap.com/alexandria/glossary/total-value-locked-tvl.

[3] Borrow interest rates are taken from aave.com, as of 8/9/2021.

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Growth : Characterized by higher price levels relative to fundamentals, such as dividends or earnings. Price levels are higher because investors are willing to pay more due to their expectations of future improvements in these fundamentals.

Cryptocurrency : a digital or virtual currency that is secured by cryptography, which makes it nearly impossible to counterfeit or double-spend.

Liquidity : The degree to which an asset or security can be bought or sold in the market without affecting the asset's price. Liquidity is characterized by a high level of trading activity. Assets that can be easily bought or sold are known as liquid asset.

Collateral : something pledged as security for repayment in the event of a loss.

Volatility : A measure of the dispersion of actual returns around a particular average level. .

Interest rates : The rate at which interest is paid by a borrower for the use of money.

Blockchain : a distributed ledger system in which a record of transactions made in cryptocurrencies are maintained across computers linked in a peer-to-peer network

Bitcoin (the currency) : A digital currency (also called a cryptocurrency) created in 2009, which is operated by a decentralized authority as opposed to a traditional central bank or monetary authority.