CS 188 Report - Yield Farming

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Introduction

Ethereum has enabled a host of financial applications that are decentralized, permissionless and trustless, thus giving rise to the field of Decentralized Finance (DeFi). Yield Farming has emerged as an exciting subfield in DeFi. In the simplest of terms, Yield Farming is a way to earn interest (yield) and incentives (sometimes automatically) over the crypto assets that you hold. There are multiple strategies to earn interest with your assets, and they can be combined in different ways to produce high rewards but with high risk. All these strategies and their permutations come under the umbrella of Yield Farming.

Core Components

The core strategies to earn yield over your assets generally involve providing liquidity to liquidity pools (LPs), lending or borrowing from lending protocols, and staking Liquidity Pool tokens.

When you have equal assets of different kinds (eg. 5 DAI and 5 USDT), you can provide liquidity to an LP in an Automatic Market Maker (AMM) like UniSwap hosted on the blockchain. One can earn yield on their assets through transaction fees from the LP as well as incentives started by the AMM. By providing liquidity, one also gets an LP token representing their share in the pool. These LP tokens can further be staked to earn direct incentives and rewards from the platform (eg. in the form of governance tokens like UNI on Uniswap). Additionally, one can also earn yields by lending their assets on a lending dApp like Compound. These dApps also incentivize investors to use their platform by providing the protocol's governance token as rewards. Compound started this by providing COMP tokens to their users, and this trend grew in popularity in the DeFi ecosystem, effectively being dubbed as Liquidity Mining. These kinds of rewards can be used to lend and borrow at the same time, thus adding higher yield percentages on their original assets. More incentives and rewards exist on platforms like Curve Finance, Sushi Swap, etc.

Moreover, investors can also combine multiple different strategies like providing liquidity after borrowing assets on collateral for highly lucrative coins. These kinds of combination strategies earn high rewards but come with a lot of risk, which we will discuss a little later.

Automatic Yield Farming (AYF)

Combining the core components of yield farming, dApps have come up that try to automate a part of the process to earn the maximum yield for your asset. The need for automatic farming of the highest yield is evident because the incentives for a particular platform won't last forever. Moreover, there is constant fluctuation in coin value and interest rates across different platforms. Manual crop rotation (shifting assets across platforms) can become a tedious and continuous exercise. Automatic yield farming can be thought of as a decentralized robo advisor with additional incentives and rewards.

For a simple example, let's say you hold X amount DAI. By depositing it into an AYF protocol, you can rest easy knowing that the protocol will earn the highest yield for your DAI. The protocol takes care of shifting the asset across different lending platforms based on the yields of those platforms. Additionally, for depositing your asset into the AYF, you also earn governance tokens of that AYF as rewards. These not only allow you to vote on the protocol, but can also be used to distribute rewards earned by the entire AYF pool of multiple depositors. Not to forget that these tokens might have some inherent value of their own.

There are different kinds of AYF protocols allowing you to deposit one or multiple assets and earn yields in one or each. Two of the most popular ones are Harvest Finance and Yearn Finance. There are also up and coming ones like Inverse Finance. Moreover, there are frontend applications like Zapper finance and InstaDapp that directly connect with your wallet to provide a list of farms currently available.

Risks

Yield farming may seem like an easy way to increase your annual yields but it is important to mention that it comes with a high risk. At the core components level, bugs in the Smart Contract or dApp can make it possible for hackers to exploit your deposited assets. Rewards from Liquidity Mining can also become obsolete if the value of the governance token falls (eg. if some group carries out a short against that token). There's also the risk of impermanent loss when providing liquidity in AMMs. Automatic Yield Farming protocols can also have bugs in their smart contracts thus exposing your assets. Moreover, their strategy can become obsolete or their governance token can fall in value. As an investor, you should always be prudent and do your thorough research before plunging into highly advertised yields.

To give an example, an attacker utilized a flash loan to manipulate the value of Harvest's USDC and USDT vaults deposited in Curve.fi. The short version of this exploit is that the hacker helped himself to $34 million from the Harvest Finance vaults and it caused their FARM token to immediately plummet.

Conclusion

Yield farming is an exciting subfield in DeFi providing ways to earn interests and rewards over the assets that you already hold. Although lucrative, it does not come without risks. As an investor, you have to be prudent and go through a comprehensive research process to know about these risks. But once educated, you can earn yields by controlling the risk according to your risk tolerance. It is also an exciting area to build new dApps, platforms and protocols as a builder with lots of innovation potential.

References

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