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DeFi Returns

Quantifying DeFi Returns and Risks

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Research and Insights

DeFi Report



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1. Executive Summary

Welcome to our article analyzing many of the popular investments in DeFi.

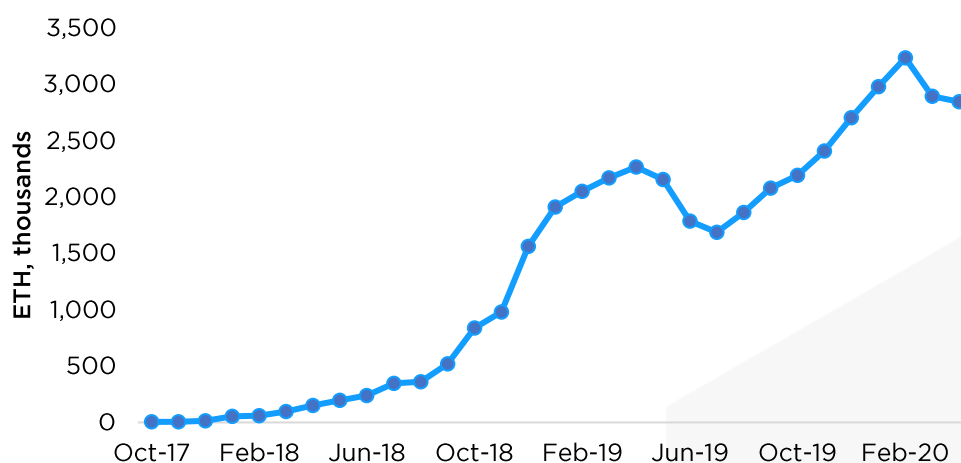
Key Takeaways

- There are three main ways to earn staking returns in DeFi: 1) platform fees (i.e. transaction fees), 2) interest by lending assets, or 3) inflationary token rewards;
- In addition to price volatility on holding the tokens themselves, there is also volatility on the interest and fees received from protocols;
- Many DeFi investments do not offer sufficient returns for their level of risk, but there are a few that do;
- DeFi provides for an alternative way to earn passive income in lieu of services offered by centralized exchanges such as [Crypto.com Earn](#);
- Although the returns from investing in the DeFi space can be attractive, there are significant risks in addition to token volatility. Since DeFi is relatively new, there are risks that were previously unknown such as price oracle manipulation and attacks. Beware when deploying any funds and make sure to do ample due diligence!

2. Introduction

DeFi first became a hot topic in the crypto space in 2019, with the proliferation of dozens of new protocols. With 2.8 million ETH (almost \$800 million) locked in DeFi applications as of April 2020, DeFi has become the most promising use case and poster child for Ethereum and smart contract blockchains everywhere.

ETH Locked in DeFi Applications



In this report, our aim is to:

- Use existing data to assess yields on various DeFi protocols;
- Quantify the risk in each investment using quantitative metrics;
- Compare each investment's risk-return characteristics

No matter your level of experience and knowledge, we hope you will take something valuable from this report and apply it to your own crypto investments!

3. Investing in DeFi

We have summarized the main return streams you can earn in DeFi below, along with which protocol gives exposure to each return type.

Type	Maker (MKR)	Synthetix (SNX)	Compound	Uniswap/ Curve.fi
Transaction Fees		✓		✓
Lending Interest	✓		✓	
Inflationary Rewards		✓		

Earning Fees

Decentralized token swappers like Uniswap rely on users to supply liquidity so that traders can buy and sell tokens on their protocols. In return for staking supply assets, liquidity providers earn fees whenever users perform transactions (read more about Uniswap [here](#)). Similarly, Synthetix allows token holders to earn fees generated every time another user makes a trade.



UNISWAP

SYNTHETIX

Lending Interest

The most common type of investment in DeFi involves supplying assets to a protocol that lends out these assets to borrowers. The interest paid by borrowers is then passed back to lenders. This is similar to how a bank pays interest on the cash deposited in your account.

There are a few DeFi platforms that allow users to supply crypto assets in return for interest yield. The largest by far is Compound. You can read our report on Compound [here](#).

Holders of MKR also receive any excess interest received from borrowers in the form of token burn. Read our report on Maker [here](#).



Inflationary Rewards

Many DeFi protocols have created their own tokens for holders to participate in governance, liquidity provision, or as a form of collateral on its system. In return, users are usually rewarded with either fees from the platform, rewards, and capital gains if the market has expectations of high future growth and/or rewards.

Synthetix (SNX) is trying to 'bootstrap' user growth and liquidity in their tokens by offering inflationary rewards to token holders in return for staking these on decentralized token swapping platforms. These offer additional returns to investors. Feel free to read more about Synthetix [here](#).

SYNTHETIX

4. Return Analysis

4.1 Methodology

Our methodology for each protocol is summarized in the following table. Note that we do not consider capital gains from token appreciation here, as we are trying to isolate purely staking returns. For more detail, the sections after the table will explain further.

Protocol	Methodology Summary
Uniswap / Curve.fi	<ul style="list-style-type: none">• 30-day historical rate of return• Impermanent loss• Applicable inflationary rewards
Synthetix	<ul style="list-style-type: none">• Current annual transaction fees generated• Staking rewards at constant SNX price
Maker	<ul style="list-style-type: none">• Snapshot of current annual fees generated
Compound	<ul style="list-style-type: none">• 30-day historical lending interest per asset

Uniswap and Curve.fi

To estimate future transaction fee income, we take returns from the past 30-days, and add a small amount based on observed transaction volume spikes during the mid-March selloff. We assume that volume spikes of the magnitude observed during the Black Thursday selloff will happen roughly once every two years.

After this, we estimate potential impermanent loss based on the price volatility of each ETH-ERC20 token pair, using the impermanent loss resulting from one standard deviation in price movement (read more about it in our [Uniswap report](#), and also on [this Medium article](#)).

Lastly, we add in any expected returns from any inflationary rewards given for providing liquidity. In particular, Synthetix has programs to reward users for staking their tokens on Uniswap and Curve.fi.

Synthetic

We calculate staking returns based on the token distribution amount for the coming year, assuming the price of SNX remains constant. We also add in the current fees generated assuming constant trade volume for the coming year. This method provides just a snapshot of the current returns, which will change as the platform grows and token inflation decreases. All calculations assume that 90% of SNX is staked.

Maker

We calculate interest earned by MKR holders by the current annualized interest spread generated on DAI outstanding. Similar to our note above for Synthetic, the interest accrued can change in the future based on the volume of borrowers on the platform, so this method simply provides a snapshot.

For both SNX and MKR, we recognize that the proper way to value forward returns is to do a DCF analysis, but this analysis would be too sensitive to assumptions and would not be consistent with the other methodologies in this report.

Lending / Passive Income (Compound)

In Compound, users supply assets to receive interest. In order to assess the long-run obtainable yields by putting assets in Compound, we took 1-year historical yields and averaged them, to smooth out any periods of unusually high or low yields.

Of course, historical returns do not indicate what could happen in the future. But for relatively stable return streams such as yields on assets, we believe this is the most prudent way to estimate returns rather than trying to estimate which way interest rates will move in the future.

4.2 Return Analysis Results

Summary of Return Analysis

Investment	Estimated Annualized Returns
Uniswap / Curve.fi	
ETH-DAI	11.7%
ETH-USDC	11.5%
ETH-REP	-3.9%
ETH-MKR	5.2%
ETH-WBTC	2.4%
ETH-WETH	0.8%
ETH-LINK	11.4%
ETH-SNX	3.7%
ETH-BAT	3.0%
ETH-sETH	10.0%
sUSD (Curve.fi)	26.8%
Compound	
Basic Attention Token (BAT)	0.4%
Multi-Collateral Dai (DAI)	5.3%
Ethereum (ETH)	0.1%
Reputation Token (REP)	0.2%
USD Coin (USDC)	4.7%
Wrapped BTC (WBTC)	0.7%
Maker (MKR)	0.1%
Maker / Synthetix	
Maker (MKR)	0.1%
Synthetix (SNX)	26.3%

Uniswap / Curve.fi

Liquidity Pool	Protocol	Estimated Annualized Returns
ETH-DAI	Uniswap	11.7%
ETH-USDC	Uniswap	11.5%
ETH-REP	Uniswap	-3.9%
ETH-MKR	Uniswap	5.2%
ETH-WBTC	Uniswap	2.4%
ETH-WETH	Uniswap	0.8%
ETH-LINK	Uniswap	11.4%
ETH-SNX	Uniswap	3.7%
ETH-BAT	Uniswap	3.0%
ETH-sETH	Uniswap	10.0%
sUSD	Curve.fi	26.8%

Let's go through Uniswap first. If you are already holding ETH and have some USD on the sidelines, there are some attractive yields to be made from supply liquidity on the ETH-DAI and ETH-USDC pairs. If you are already holding LINK, providing liquidity in the ETH-LINK pool can also be attractive. For more information on Uniswap and how to become a liquidity provider, please read our report on Uniswap [here](#).

Note that liquidity pools for Uniswap are relatively small. Make sure to check the size of the pools on [pools.fyi](#) or [uniswap.info](#) to make sure you are not injecting a disproportionately large amount of liquidity.

Also take note that losses called 'impermanent loss' could be incurred. This concept is explained in detail in our [Uniswap report](#) and also in [this Medium article](#).

Synthetic is also incentivizing users to provide liquidity on the ETH-sETH (Synth ETH) Uniswap pool as well as the sUSD (Synth USD) Curve.fi pool. Incentives are paid in the form of inflationary SNX, which boosts the return on the ETH-sETH and sUSD liquidity pools.

Compound

Type	Estimated Annualized Returns
Basic Attention Token (BAT)	0.4%
Multi-Collateral Dai (DAI)	5.3%
Ethereum (ETH)	0.1%
Reputation Token (REP)	0.2%
USD Coin (USDC)	4.7%
Wrapped BTC (WBTC)	0.7%
Ox Token (ZRX)	0.3%

There are two notable asset types which are somewhat attractive from a yield standpoint: DAI and USDC. These are both stablecoins, so the risk taken is relatively low, and the yield is relatively high (5.3% and 4.7% respectively). Returns on other tokens are low and only recommended if users are already holding these tokens.

Maker and Synthetix

Investment	Estimated Annualized Returns
Maker (MKR)	0.0%
Synthetix (SNX)	26.3%

Maker

Ever since the Black Thursday selloff, Maker governance has been struggling to maintain the DAI peg due to excessive demand for DAI from vault creators rushing to close out their vaults. As a result, Maker governance has elected to set the interest rates on borrowing to 0% for the foreseeable future until the peg stabilizes.

Synthetix

There is roughly \$300,000 of trade volume per day on Synthetix Exchange, which equates to roughly 0.3% annual yield on SNX staking based on current SNX market cap. Inflationary staking rewards for the next year on SNX are 26%.

5. Risk Analysis

Now that we have a good idea what types of returns can be made from various DeFi protocols, let's examine the risks. We have split this section into two sub-sections.

First, we measure the risk of each investment based purely on the risks of staking. This is a useful measure when you are already holding the tokens in question. This is described in section 5.1.

After this, we consider staking risk plus the additional risk that the tokens fall in value relative to USD. This is described in section 5.2

The risks we consider are summarized below:

5.1 Risks of Staking Only

Methodology

As mentioned above, we consider just the risks of staking here, stripping out the effect of token price movements.

The risks and our methodology for calculating them are summarized below:

Risk	Methodology
Yield Volatility	Annualized standard deviation of the yield from interest, transaction fees, etc. Yield volatility is calculated in terms of the token invested
Impermanent Loss	Impermanent loss experienced with one standard deviation move in token prices
Smart Contract Risk	Estimated from smart contract insurance costs on Nexus Mutual – constant 2% annualized

Risk Results (Staking Only)

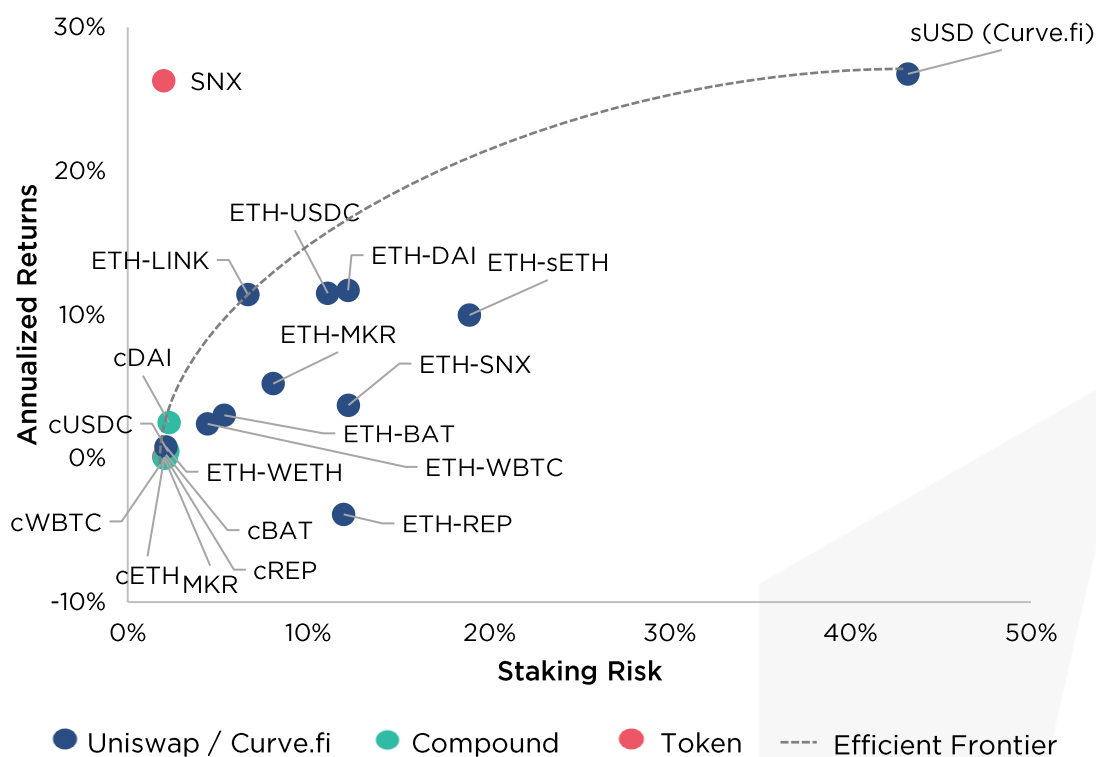
Type	Estimated Annualized Returns	Staking Risk	Sharpe Ratio
Token Investment / Staking			
Maker (MKR)	0.1%	2.0%	0.1
Synthetix (SNX)	26.3%	2.0%	13.1
Lending / Passive Income on Compound			
BAT	0.4%	2.1%	0.1
DAI	5.3%	2.3%	1.1
ETH	0.1%	2.0%	0.0
REP	0.2%	2.1%	0.0
USDC	4.7%	2.2%	0.2
WBTC	0.7%	2.1%	0.1
Liquidity Provision (Uniswap unless mentioned)			
ETH-DAI	11.7%	12.2%	1.0
ETH-USDC	11.5%	11.1%	1.0
ETH-REP	-3.9%	12.0%	-0.3
ETH-MKR	5.2%	8.0%	0.6
ETH-WBTC	2.4%	4.4%	0.5
ETH-WETH	0.8%	2.1%	0.4
ETH-LINK	11.4%	6.7%	1.7
ETH-SNX	3.7%	12.2%	0.3
ETH-BAT	3.0%	5.3%	0.6
ETH-sETH	10.0%	18.9%	0.5
sUSD liquidity (Curve.fi)	26.8%	43.2%	0.6

ETH-sETH and sUSD risk look unusually high because most of the returns from those investments come from [inflationary rewards](#) paid in SNX, which causes a high level of yield volatility.

Plotting an Efficient Frontier

We can plot the data above into a scatter plot to visualize how attractive each investment is given its risk.

Risk-Return of DeFi Investments



On pure staking returns when ignoring token price fluctuations, it seems that depositing ETH-LINK, ETH-DAI, and ETH-USDC on Uniswap also offer an attractive risk-return profile. All other investments fall on or within what is called the “[efficient frontier](#).” The efficient frontier describes investments that generate sufficient returns for given risk levels. Investments that fall below the efficient frontier are sub-optimal because investors are not sufficiently rewarded for the risk taken.

Based on the chart above, it might be easy to conclude that SNX gives unusually high returns for its level of risk. However, we should note that this is because SNX inflation rewards are currently very high. The returns look very high and the risks very low because everything is measured in SNX. In reality, SNX token prices are very volatile. The effect of token price volatility is considered in the next section.

5.2 Factoring in Token Price Volatility

The risk analysis above does not account for the price movements of the tokens in each investment. In this section, we will include token price volatility (in terms of USD). This will be useful to assess the risk to users who are starting with fiat or stablecoin balances and buying the corresponding tokens.

Methodology

Token price volatility is measured by the standard deviation of the USD price of each investment. On top of that, we add back the staking risks as calculated above.

To calculate volatility of non-stablecoin tokens, we have taken 1-year historical USD prices and calculated their standard deviations.

For stablecoins, we simply define the price risk as the maximum percentage amount they have deviated from their pegs (positive or negative) over the past year to proxy the likelihood that the peg breaks to the downside.

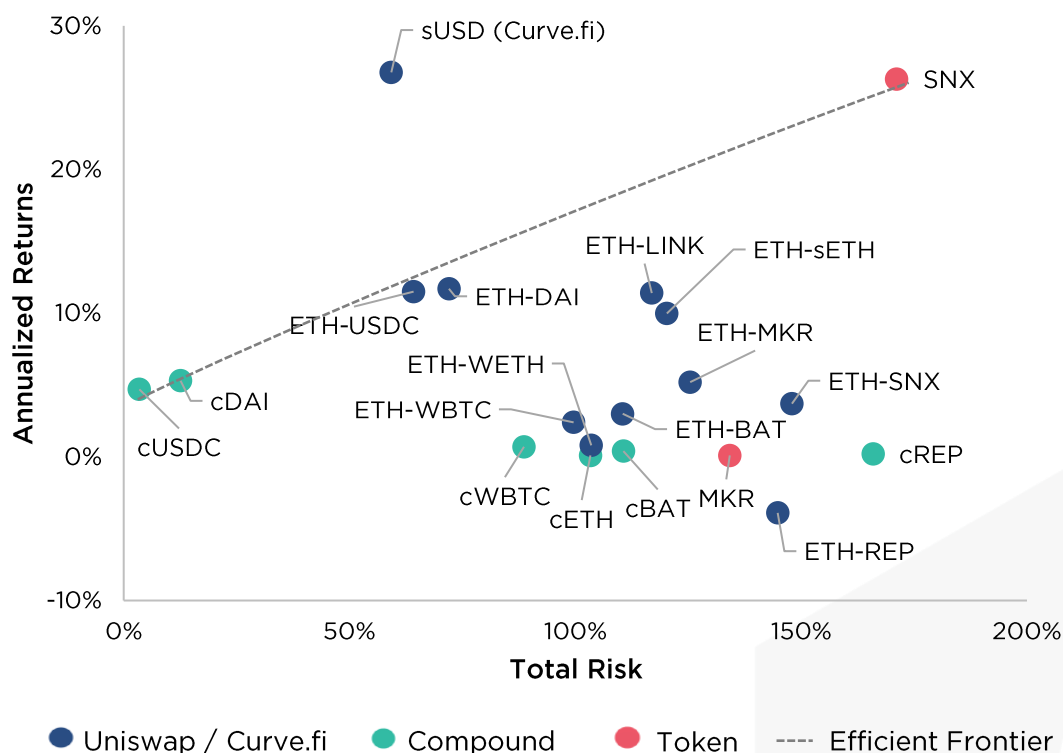
We summarize our findings on the next page.

Risk Results (with Token Price Risk)

Type	Estimated Annualized Returns	Total Risk	Sharpe Ratio
Token Investment / Staking			
Maker (MKR)	-13.4%	134.2%	0.0
Synthetic (SNX)	25.1%	171.1%	0.2
Lending / Passive Income on Compound			
BAT	0.4%	110.6%	0.0
DAI	5.3%	12.6%	0.2
ETH	0.1%	103.3%	0.0
REP	0.2%	165.9%	0.0
USDC	4.7%	3.5%	0.1
WBTC	0.7%	88.6%	0.0
Liquidity Provision (Uniswap unless mentioned)			
ETH-DAI	11.7%	72.0%	0.2
ETH-USDC	11.5%	64.2%	0.2
ETH-REP	-3.9%	144.8%	0.0
ETH-MKR	5.2%	125.4%	0.0
ETH-WBTC	2.4%	99.6%	0.0
ETH-WETH	0.8%	103.5%	0.0
ETH-LINK	11.4%	116.9%	0.1
ETH-SNX	3.7%	148.0%	0.0
ETH-BAT	3.0%	110.5%	0.0
ETH-sETH	15.8%	120.3%	0.1
sUSD liquidity (Curve.fi)	24.7%	59.2%	0.5

Like in the previous section, we plot the data above into a scatter plot to visualize how attractive each investment is given its risk.

Risk-Return of DeFi Investments



Based on the above, we can see that the outlier is sUSD staking on Curve.fi, which offers 27% return for risk of just 12%. This is likely explained by the fact that the sUSD curve program was just [introduced in early March](#), and is subject to change. Furthermore, staking incentives are paid in SNX, which is a very volatile token.

Our analysis also suggests that the following investments supplying USDC and DAI on Compound, ETH-USDC and ETH-DAI on Uniswap, give reasonable returns for their corresponding levels of risk.

At this point we must also note that despite SNX looking like a very good investment, most of the rewards from SNX are inflationary and as such, these rewards are theoretically neutral expected value for token holders. As we note in our [Token Inflation Study](#), token inflation has no correlation with market cap.

6. Summary

Key Takeaways

- There are three main ways to earn staking returns in DeFi: 1) platform fees (i.e. transaction fees), 2) interest by lending assets, or 3) inflationary token rewards;
- In addition to price volatility on holding the tokens themselves, there is also volatility on the interest and fees received from protocols;
- Many DeFi investments do not offer sufficient returns for their level of risk, but there are a few that do;
- DeFi provides for an alternative way to earn passive income in lieu of services offered by centralized exchanges such as [Crypto.com Earn](#);
- Although the returns from investing in the DeFi space can be attractive, there are significant risks in addition to token volatility. Since DeFi is relatively new, there are risks that were previously unknown such as price oracle manipulation and attacks. Beware when deploying any funds and make sure to do ample due diligence!

7. References

Blocklytics. (2020). *Pools.fyi*. Retrieved from <https://pools.fyi>

Crypto.com. (2020). *Compound*. Retrieved from <https://crypto.com/en/research/article.html?category=defi&page=compound>

Crypto.com. (2020). *MakerDAO*. Retrieved from <https://crypto.com/en/research/article.html?category=defi&page=makerdao>

Crypto.com. (2020). *Token Inflation Study*. Retrieved from https://crypto.com/en/research/article.html?category=data&page=token_inflation

Crypto.com. (2020). *Uniswap*. Retrieved from <https://crypto.com/en/research/article.html?category=defi&page=uniswap>

Pintail. (2019). *Uniswap: A Good Deal for Liquidity Providers?* Medium. Retrieved from <https://medium.com/@pintail/uniswap-a-good-deal-for-liquidity-providers-104c0b6816f2>

Solomon, M. (2020). *Compound Lending Rates*. Retrieved from <https://mattsolomon.dev/compound-rates>



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