

# Part 1: Introduction to Crypto Leveraged ETFs

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Traders often think they can beat the market.

Truth is most failed to do so, and your next best bet is probably to invest in an Exchange Traded Fund (ETF). For those who are interested in decentralized ETF, you can [read my analysis here](#).

Nonetheless, one of the traders' idiosyncrasies is they are always on the lookout to maximize their profit with different means such as leverage. For some, investing in an ETF may be too vanilla for their investment preference. If you don't know what leverage is, I encourage you to read [Leverage 101 - A Short Primer](#) by Hasu.

Leveraged ETF might be a better product fit for those looking for compounding returns in a shorter time frame, specifically those seeking daily returns.

However, is leveraged ETF as simple as it seems, or is there any hidden pitfall?

We will discuss all about it in our two-part crypto leveraged ETFs series:

- Part 1: Introduction to leveraged ETFs
- Part 2: Deep dive into decentralized leveraged ETFs

What you can expect from the first part of the series is a short primer on leveraged ETFs, and the subject will focus on the centralized crypto leveraged ETFs such as those issued by FTX, Binance, and Gate.io.

In the second part, we will explore the decentralized leveraged ETFs - the Flexible Index Tokens (FLI) tokens from Index Coop. Once we have covered the basics, we will evaluate the key difference between centralized and decentralized leveraged ETFs.

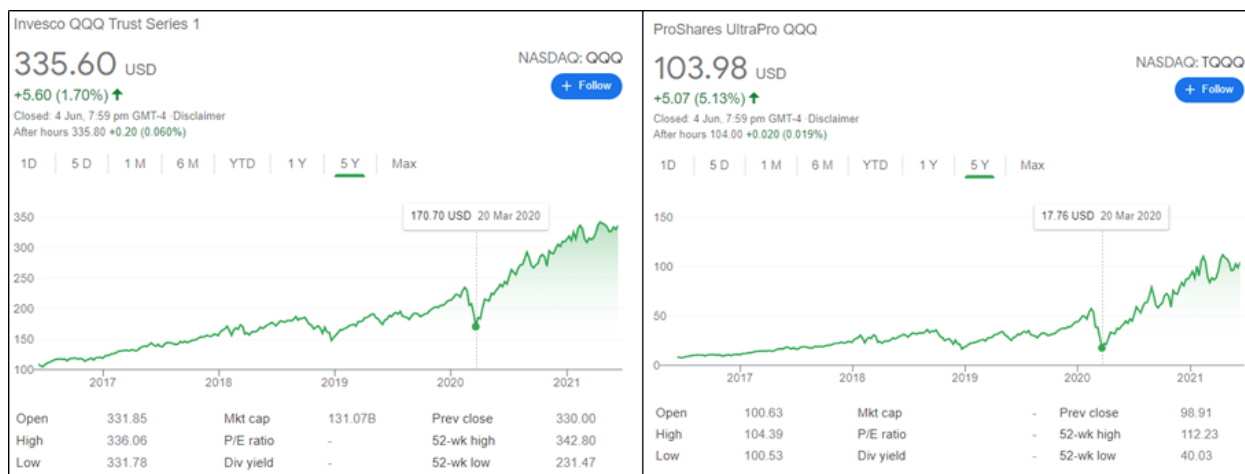
In this article, you will learn the basics of leveraged ETFs:

- Types of leveraged ETFs
- How rebalancing works
- Profit and loss calculation
- The shortcoming of leveraged ETFs: Volatility Decay
- Associated fees
- Why should you trade leveraged ETFs

## What are Leveraged ETFs?

A leveraged ETF is a financial instrument that amplifies the daily return of an underlying index. A 2x leveraged ETF seeks to double the daily return of an underlying index. For example, a 2% return in S&P500 would lead the 2x leveraged ETF to double its return to 4%. In legacy finance, leveraged ETFs achieve their target leverage via several derivatives such as index futures, equity swaps, and index options.<sup>1</sup>

For example, QQQ is a NASDAQ-100 ETF, and TQQQ is a 3x leveraged ETF of NASDAQ-100. QQQ had a daily return of 1.7% on June 4th, and TQQQ saw a 3x higher return of that at 5.1%.



Source: Google

In crypto, leveraged ETFs typically use perpetual swaps to achieve the target leverage.

*A perpetual swap is a futures contract that enables users to open a leveraged position with no expiration date.*

There are two types of crypto leveraged ETF:

1. Leveraged ETF Contract
2. Leveraged ETF Token

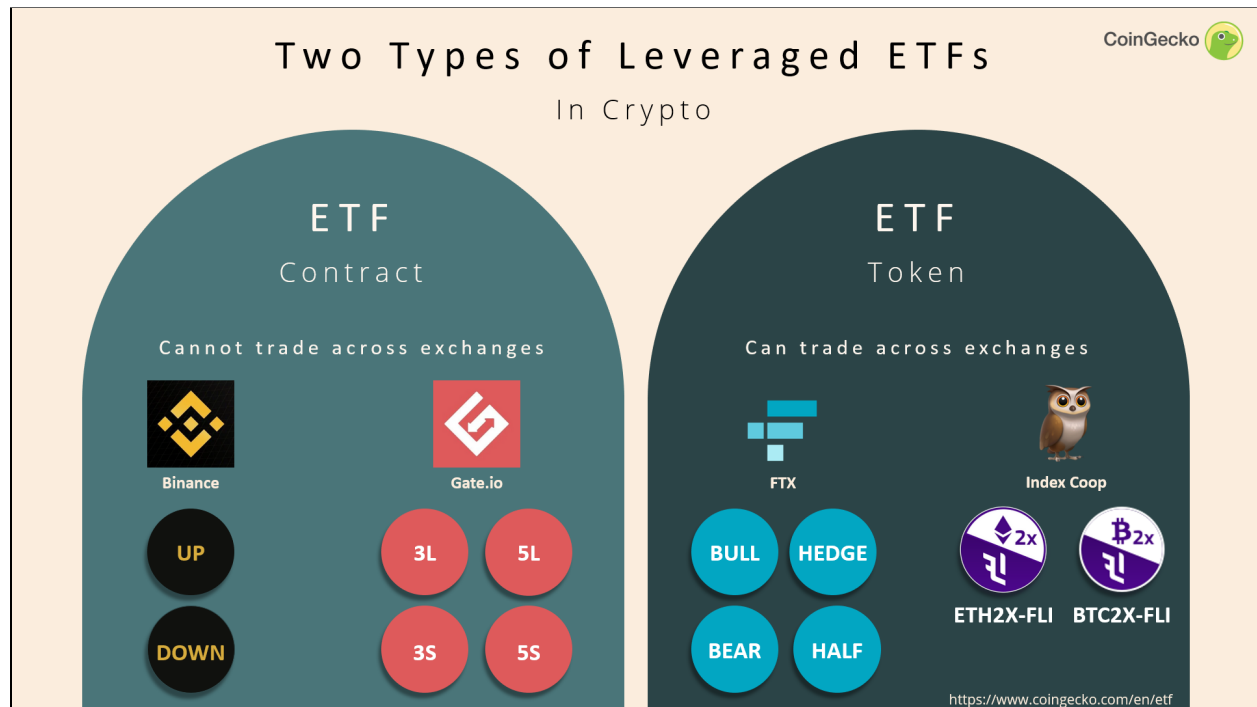
The main difference between an ETF contract and an ETF token is that you cannot withdraw the contract from the issuer's platform and can only trade it within the issuer's market. Examples for ETF contracts are BTCUP and BTCDOWN by Binance, where you can only trade them on the Binance spot market and nowhere else.

*Disclaimer: Although Binance called their leveraged ETFs as Binance Leveraged Tokens (BLVTs), the "tokens" are not issued on-chain, and hence, we view BLVTs as contracts rather than tokens.*

<sup>1</sup> "Dissecting Leveraged ETF Returns - Investopedia."

<https://www.investopedia.com/articles/exchangetradedfunds/07/leveraged-etf.asp>. Accessed 20 Jun. 2021.

ETF tokens are also ETF contracts but with an additional **ERC-20** token wrapper. Therefore, you can withdraw them from the issuer's platform and trade them elsewhere that support the standard. For instance, you can withdraw **ETHBULL** tokens from FTX and trade them on other supported platforms like Poloniex, Ascendex, and GoPax.



	Binance	Gate.io	FTX	Index Coop
<b>Type of Leveraged ETFs</b>	Contract	Contract	Token (ERC-20)	Token (ERC-20)
<b>Leverage range</b>	Variable <ul style="list-style-type: none"> <li>UP (1.25x ~ 4x)</li> <li>DOWN (-1.25x ~ -4x)</li> </ul>	Fixed <ul style="list-style-type: none"> <li>3L (3x)</li> <li>3S (-3x)</li> <li>5L (5x)</li> <li>5S (-5x)</li> </ul>	Fixed <ul style="list-style-type: none"> <li>BULL (3x)</li> <li>BEAR (-3x)</li> <li>HEDGE (-1x)</li> <li>HALF (0.5x)</li> </ul>	Fixed <ul style="list-style-type: none"> <li>Token2x-FLI (2x)</li> </ul>

From now on, we will mainly discuss leveraged tokens from FTX and Binance.

## How does a leveraged ETF work?

The key point about leveraged ETFs is they track the **daily performance** of the underlying assets or indexes. Thus, the profitability of holding leveraged tokens over longer periods may differ from what you initially expected.

Let's use the ETHBULL token from FTX to examine how a leveraged token works. ETHBULL is a 3x long ETH token, which means for every 1% increase in ETH in a day, ETHBULL will go up 3% and vice versa. The price of a leveraged ETF on FTX is based on its Net Asset Value (NAV), which is derived from its **perpetual swap counterparts**.

*Net asset value (NAV) is the fair price of the underlying assets.*

*NAV = Underlying token exposure + borrowed funds within the basket.*

Let's go through a little bit of math based on a snapshot of ETHBULL to understand the details on the picture below:

**3X Long Ethereum Token (ETHBULL) is an ERC20 token which seeks a return that corresponds to 3 times the daily return of Ethereum.**

Underlying:	Ethereum (ETH)
Leverage: <b>3</b>	3
Current leverage: <b>4</b>	2.90
Tokens outstanding:	21,478.0387 ETHBULL
Basket: <b>1</b>	1.545526 ETH-PERP -2,599.883 USD
Basket value: <b>2</b>	\$1,367.95
Total fund value:	\$29,380,797.41
Total fund collateral:	\$29,005,695.43

ETHBULL Token Tracker  
ETHBULL BEP2 Token Tracker

Source: <https://ftx.com/tokens/ETHBULL> and <https://ftx.com/api/lt/ETHBULL>  
(snapshot taken on 14th June 2021, 9 PM MYT)

At snapshot, 1 ETH perpetual swap is trading at \$2,567.30 (based on the API).

- 1) **Basket:** This shows the current holding of 1 ETHBULL. It has 1.545526 ETH-PERP (3x long ETH perpetual swap position) and -\$2,599.88 of borrowed funds.
- 2) **Basket Value:** This refers to the NAV of this ETHBULL which also indicates the price of ETHBULL. Based on the snapshot, ETHBULL is priced at \$1,367.95.

$$\text{NAV} = \text{Underlying token exposure} + \text{borrowed funds within the basket}$$

$$\text{NAV} = 1.545526 \text{ ETH} * \$2,567.30 + (-\$2,599.88) = \$1,367.95$$

Hence, a 10% rise in the ETH perpetual swap price would result in a 30% rise in the ETHBULL price.

- 3) **Leverage:** This is the target leverage of 3x.
- 4) **Current Leverage:** This is the current state of ETHBULL leverage at 2.90.

$$\begin{aligned} \text{Current Leverage} &= \text{Current underlying token exposure} / \text{ETHBULL NAV} \\ \text{Current Leverage} &= (1.545526 \text{ ETH} * \$2,567.30) / \$1,367.95 = 2.90 \end{aligned}$$

The current leverage is slightly away from its 3x target. Hence, the ETHBULL will need to make an adjustment known as **rebalancing** to return to its original 3x leverage.

### How does rebalancing work?

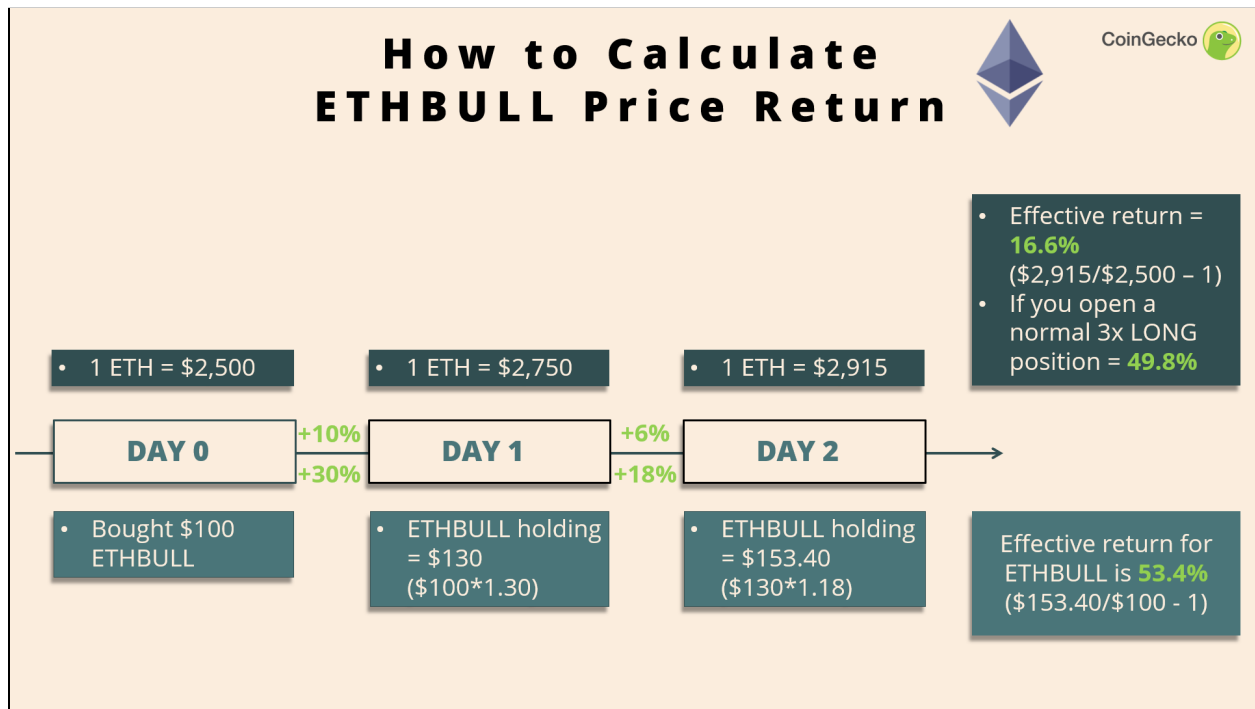
Rebalancing means that the swap positions of the leveraged ETF will increase or decrease to reach its target leverage. Each issuer has a different rebalancing frequency. For example, leveraged ETFs on FTX are rebalanced once a day at 2 A.M. UTC or whenever the tokens are overleveraged. Binance on the other hand does not disclose its rebalancing frequency.

Referring back to our example above, ETHBULL will buy 0.053 ETH by borrowing \$136.02 during rebalancing (e.g., 2 A.M. UTC on FTX).

$$\begin{aligned} \text{Rebalancing size of each Leveraged Token} &= \text{Desired position} - \text{Current position} \\ \text{Desired position} &= [\text{Target leverage}] * [\text{NAV} / \text{Underlying mark price}] \\ \text{Desired position} &= 3 * \$1,367.95 / \$2,567.30 = 1.60 \text{ ETH} \\ \text{Current position} &= 1.545526 \text{ ETH} \\ \text{Rebalancing size of each Leveraged Token} &= 1.60 \text{ ETH} - 1.545526 \text{ ETH} \\ \text{Rebalancing size} &\approx 0.053 \text{ ETH} \end{aligned}$$

After rebalancing, 1 ETHBULL token will now consist of 1.60 ETH (\$4,103.85) and -\$2,735.90 borrowed fund, which would then restore the leverage to 3x.

## How do you calculate the performance of a leveraged ETF?



Let's assume you bought 1 ETH at \$2,500 on day 0, and it goes up to \$2,750 on day 1. Then, it increases further to \$2,915 on day 2.

You would have made 16.6% for spot trading, and if you open a perpetual swap 3x LONG position, you would have made 49.8%.

However, with a leveraged ETF like ETHBULL, you would compound your gain to 53.4%, thanks to daily rebalancing. On day 1, ETHBULL increased by 30%, and then it rebalanced by buying more ETH to maintain the 3x leverage. Then, on day 2, it will increase another 18% from the new price adjusted on day 1. This results in a 53.4% effective return from the original \$2,500.

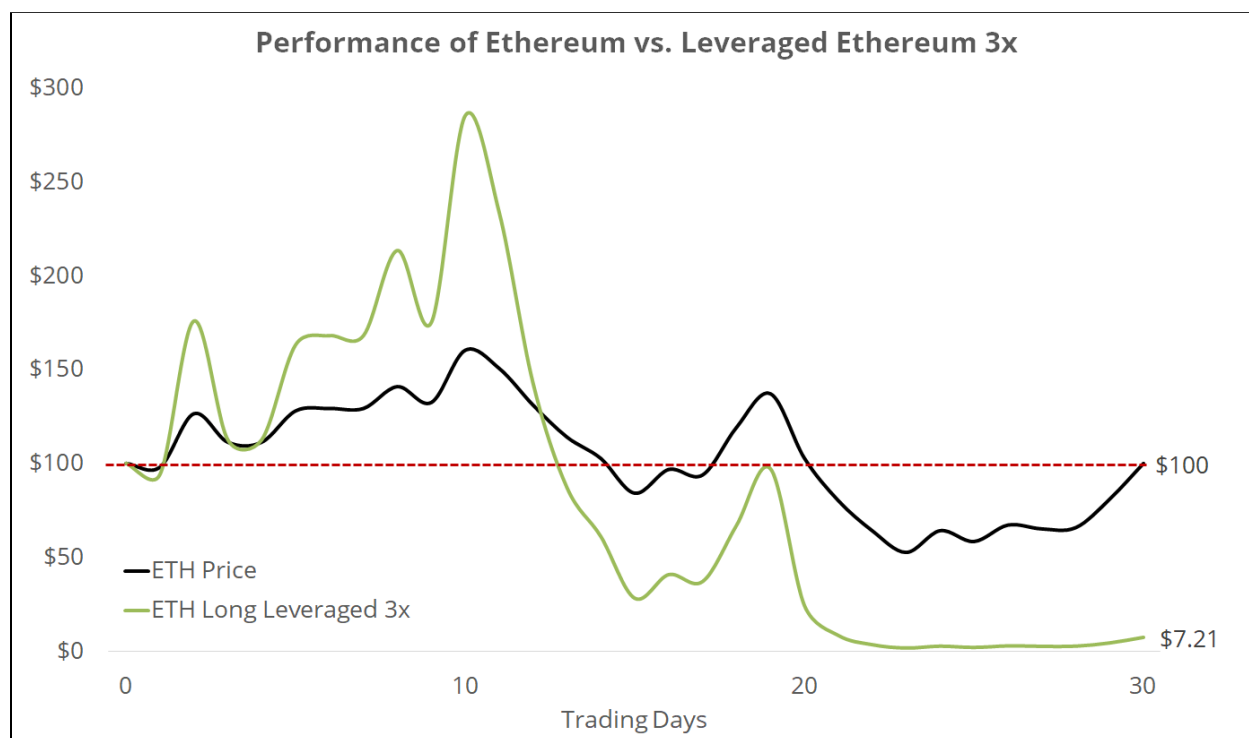
Each leveraged ETF token or contract reinvests the profit when money is made and would create a compounding effect and higher returns. However, the flywheel works in the opposite direction as well. It will sell off some of its position when money is lost to ensure the 3x leverage is retained and avoid liquidation risk.

Therefore, you should not long-term hold a leveraged ETF because daily or intraday rebalancing would leave you with a smaller capital in a high volatility market.

## Word of Caution: Volatility Decay

The number one mistake most new traders make is holding leveraged ETFs for an extended period. This is because the performance of leveraged ETFs is highly influenced by daily volatility and likely results in compounding loss in the longer term. This is known as **volatility decay**.

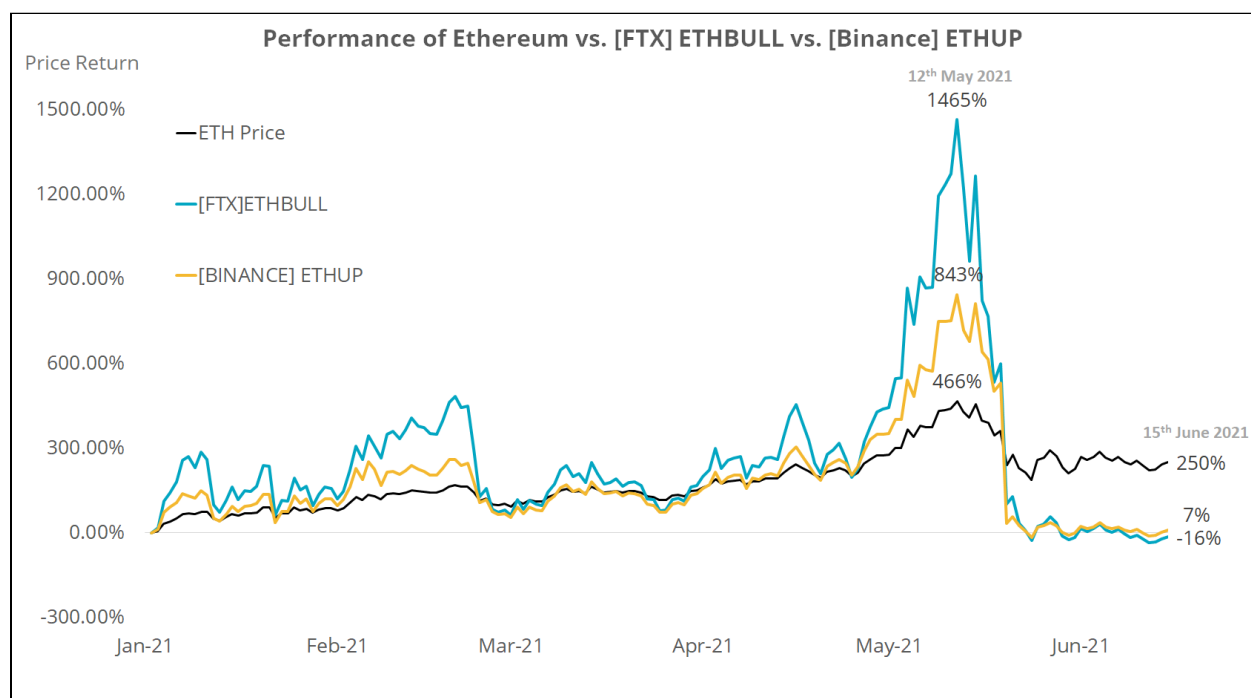
The higher the volatility, the higher the decay.



To see how volatility decay works, here is the simulation on ETH price volatility with +/- 30% daily price movement within 30 days.

- **Day 0 - Day 10:** ETH price rallied from \$100 to \$160. As for 3x Leveraged Ethereum, its price jumped to \$285; the return is **more than 3x** of the ETH spot price as the gain was compounded in each rebalancing.
- **Day 10 - Day 20:** ETH price declined by 36% to \$102. As a result, Long Leveraged ETH 3x plunged to \$24, a **92% loss from its peak (\$285)**. This is because it had to sell off some of its position during the market downturn to maintain its 3x leverage.
- **Day 20 - 30:** ETH price recovered to its original price at \$100 after 30 trading days. However, Long Leveraged ETH 3x is now priced at \$7.21, **93% less** than the original price.

Overall, Ethereum price return remains at breakeven despite the high volatility within 30 trading days. In contrast, the high volatility has impacted Leveraged ETH 3x daily performance, resulting in over 90% NAV erosion due to volatility decay.



Source: CoinGecko, Binance

The graph above compares the year-to-date price performance of Ethereum against its leveraged ETFs on FTX (ETHBULL) and Binance (ETHUP) as of 15th June 2021.

During the bull market, FTX's ETHBULL performed better than Binance's ETHUP. That said, ETHUP has irregular rebalancing and ranged target leverage, thereby reducing volatility. As a result, it worked better than ETHBULL during the downtrend market.

All in all, holding ETH on spot has proven to be better in the long term as it has appreciated 250% year-to-date; meanwhile, the two leveraged ETFs underperformed. In fact, you would have incurred a 16% loss if you were to hold FTX's ETHBULL since the beginning of the year.

Below is the summary of 4 different cases if you were to hold a leveraged ETF for more than one day:



#### Uptrend market

Day	ETH Price	ETH Return	ETHBULL	ETHBULL Return
Monday	\$ 2,500.00		\$ 100.00	
Tuesday	\$ 2,750.00	+10%	\$ 130.00	+30%
Wednesday	\$ 3,025.00	+10%	\$ 169.00	+30%
Thursday	\$ 3,327.50	+10%	\$ 219.70	+30%
Friday	\$ 3,660.25	+10%	\$ 285.61	+30%
Return since inception		+46%		+186%

#### Downtrend market

Day	ETH Price	ETH Return	ETHBULL	ETHBULL Return
Monday	\$ 2,500.00		\$ 100.00	
Tuesday	\$ 2,250.00	-10%	\$ 70.00	-30%
Wednesday	\$ 2,025.00	-10%	\$ 49.00	-30%
Thursday	\$ 1,822.50	-10%	\$ 34.30	-30%
Friday	\$ 1,640.25	-10%	\$ 24.01	-30%
Return since inception		-34%		-76%

#### Volatile Market: Rise and Fall

Day	ETH Price	ETH Return	ETHBULL	ETHBULL Return
Monday	\$ 2,500.00		\$ 100.00	
Tuesday	\$ 2,750.00	+10%	\$ 130.00	+30%
Wednesday	\$ 2,200.00	-20%	\$ 52.00	-60%
Thursday	\$ 1,980.00	-10%	\$ 36.40	-30%
Friday	\$ 2,574.00	+30%	\$ 69.16	+90%
Return since inception		+3%		-31%

#### Volatile Market: Fall and Rise

Day	ETH Price	ETH Return	ETHBULL	ETHBULL Return
Monday	\$ 2,500.00		\$ 100.00	
Tuesday	\$ 2,250.00	-10%	\$ 70.00	-30%
Wednesday	\$ 1,800.00	-20%	\$ 28.00	-60%
Thursday	\$ 1,980.00	10%	\$ 36.40	30%
Friday	\$ 2,500.00	-30%	\$ 3.64	-90%
Return since inception		0%		-96%

- Uptrend market**  
 Assuming ETH goes up 10% every day, you will gain 4x more by holding ETHBULL than holding ETH on spot.
- Downtrend market**  
 Assuming the market goes down 10% every day, you would lose 2x more by holding ETHBULL than holding spot ETH.
- Volatile market: Rise and Fall & Fall and Rise**  
 Assuming the market goes up and down violently, you would benefit more by holding ETH on spot than the leveraged ETF because the volatility decay will lead to amplified loss.

## What are the fees involved?

	FTX	Binance	Gate.io
Type of Leveraged ETFs	Token (ERC-20)	Contract	Contract
Number of Leveraged ETF supported (own products)	221	40	148
Leverage range	Fixed (-/+3x, -1x, 0.5)	Variable (-/+ 1.25x ~ -/+4x)	Fixed 3x Long/Short
Creation and Redemption fees	0.1%	0.1%	n/a
Daily management fees	0.03%	0.01%	0.3%**
Funding rates	Yes	Yes	Included in management fee
Trading fees*	Yes	Yes	Included in management

			fee
<b>Withdrawable</b>	Yes	No	No
<b>Rebalancing</b>	2 A.M. UTC or as soon as the leverage tokens are trading above the target	As-needed-basis (irregular rebalancing at an unknown cadence)	12 A.M. UTC

Data as of 14th June 2021

\*Subjected to each exchange:

- FTX: <https://help.ftx.com/hc/en-us/articles/360024479432-Fees>
- Binance: <https://www.binance.com/en/fee/schedule>
- Gate.io: <https://www.gate.io/en/fee>

\*\* 0.3% covers all costs including trading and funding payment.

Leveraged ETF holders typically pay three types of fees:

- **Daily management fees**  
The daily management fee is charged based on a percentage of the NAV. It will be deducted from the underlying assets and reflected on its price. As for funding rates, it will also directly affect the NAV. However, both fees do not affect users' holding quantity.
- **Creation and Redemption fees**  
A 0.1% fee on creation and redemption as a cost of opening and closing positions; note there is no 0.1% fee if you buy the leveraged ETFs on the spot market.
- **Trading fees**  
The leveraged ETFs are traded on the spot market of the issuer's platform. Therefore, standard trading fees are applied.

*Funding rates are periodic payments made by traders to keep the perpetual swap price as close as the spot price, which will affect the NAV directly.*

The fees are expensive because the issuer handles leveraged ETF products via perpetual contract with the following features:

- Automated rebalancing
- No collateral needed
- No liquidation risk
- potentially make better returns during a trending market.

**Why choose Leveraged ETF instead of other types of leverage trading (e.g., margin spot, perpetual swaps, futures, and options)?**

	Leveraged ETF	Margin Spot	Perpetual Swaps	Futures	Options
<b>Collateral</b>	No	Yes	Yes	Yes	No

<b>Fees involved</b>	(1) Daily management fees (2) Funding rate (3) Creation and redemption fees (4) Trading fees	(1) Daily Interest rate (2) Trading fees	(1) Funding rates (2) Trading fees	(1) Funding rates (2) Interest rates	(1) Option exercise fee (2) Trading fees (3) Liquidation fee
<b>Short or Long Term</b>	Short	Short & Long	Short & Long depending on funding cost	Short & Long depending on funding cost	Long

There are three key points you can consider to trade leveraged ETFs instead of another type of leverage trading:

- Reduce Liquidation Risks**  
 Unlike margin spot or perpetual swaps, you do not need to deposit any collateral in order to trade as it auto-rebalances the underlying assets for you. Therefore, eliminating the risk of liquidation.
- Compounding Earning**  
 The leveraged ETFs will automatically reinvest your profit on the previous rebalancing to the next rebalancing.
- Short-term Profit**  
 The leveraged ETFs are set for traders who want to take advantage of a trending market. It helps to compound profit higher than the regular LONG or SHORT perpetual swaps.

## Conclusion

Although trading leveraged ETFs seems reasonably simple, **it is not recommended** for inexperienced and undisciplined traders due to the high volatility of cryptocurrencies.

You will likely incur a loss if you enter the market at the wrong time (e.g., volatile market). Leveraged ETFs are dangerous as it inherits volatility decay that would result in severe loss in the long-run. You are better off holding a spot position or use a different leverage trading strategy in a choppy market.

In short, leveraged ETFs are only beneficial for short-term play in a trending market.

In the next article, we will shift our lens towards decentralized ETFs: the Flexible Index Tokens (FLI) tokens from Index Coop. Then, we will evaluate them against their centralized counterparts to determine if they are a better investment product for traders.