

# Crypto ETFs: A Game Of Benefits and Risks

Authors: Gate.io Research Tintin Deng, Caroline Feng, Jill Chow

Translators: Page Xu, Lisa Liu, Johnny Huang, Patrick Velleman

## Abstract

It was less than one year ago that the crypto ETF market was born. Since then, it captured the attention of a significant number of investors due to its convenient operation and high profits. According to analysis, leveraged ETF trading not only brings more substantial gains in a singular market move but also causes a milder loss than margin trading with the same leveraged ratio when the market goes either way. Nonetheless, in the simulation of this research, leveraged ETF trading suffered more severe losses in a volatile market, which exceeded that of spot trading and margin trading in the same ratio. Compared with multiple ETF products in the traditional financial market, currently, the cryptocurrency market has only rolled out leveraged ETFs that are mainly centered around mainstream currencies. Besides, the crypto ETF market is still immature, along with the high handling fees as opposed to the twenty-year development of the traditional market. Given that leveraged ETFs are not suitable for a long-term hold, Gate.io research has built a VPIN model combined with the Moving Average (MA) and found that VPIN can

mitigate the risks accordingly and increase the benefits of ETF considerably. However, since crypto ETFs have not yet obtained approval from a supervising organization, the overall policy trend will be a focal point in the future.

## Key Takeaways

- In a singular market move, if the price of leveraged ETFs goes as expected, investors can gain more substantial profits than those in a margin trade with the same leveraged ratio. Additionally, if the price of leveraged ETFs goes in the opposite trend, the incurred losses are milder than those of margin trading with the same leveraged ratio.
- In a volatile market, leveraged ETF trading suffered more severe losses, which exceeded that of spot trading and margin trading in the same ratio. Hence, it is not suitable to invest in leveraged ETFs when the market fluctuates.
- In comparison with ETFs of 1988 in the US market, which occupied 3.4 trillion USD of the market, there are “only” dozens of ETF products in the cryptocurrency industry, which is at its primary stage. Thus, it appears that there will be more types of crypto ETFs provided in the future, which are likely to run in a direction that is similar to that of traditional financial products.

- It can be seen that crypto ETF products incur more risks compared to leveraged ETFs in the US stock. Thereby, when being confronted with a market swing, the exchanges will even suffer potential losses.
- The VPIN coefficient of BTC lies between 0.4 and 0.6 most of the time, which means the current trading volume of informed traders takes up about a half of the BTC market. Through analyzing the fierce volatility of BTC, it can be concluded that VPIN has a relatively effective prediction for short-term trading.
- Gate.io research has built a VPIN model to observe the benefit variation of the ETF. According to the results, trading that refers to the VPIN coefficient makes it possible to gain massive profits and reduce the risk of drawdown.
- Up until now, the crypto ETFs have not been approved by Law in any country, and the prosperous development of the crypto ETF market requires the support of supervising organizations.

## 1. Leveraged ETF

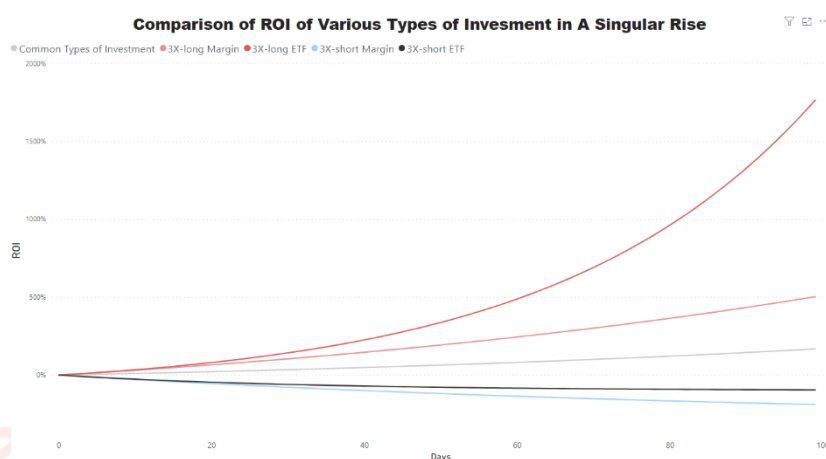
Compared with open-end funds, ETFs (Exchange Traded Fund) can be traded anytime. Investing in ETFs requires one to have an account through which he can sell or buy securities. With enough shares of the ETF, an investor can form a creation unit so as to redeem the underlying securities.

April 2020

At present, only leveraged ETFs are launched in crypto exchanges. As for leveraged or inverse ETFs, they seek to track the amplified returns of their underlying indexes daily by taking advantage of financial derivatives, such as stock index futures and swap contracts. However, for margin trading, it tracks the total yield of its underlying index. For instance, a leveraged ETF will magnify each 1% gain of the underlying asset to 1.5%, 2% or 3% gain with financial products. Both margin trading and leveraged ETFs are compared in the following paragraphs in terms of their profits under one-sided and volatile market conditions.

### 1.1 Leveraged ETFs Outperform Margin Trading in One-sided Market Conditions

Their profits are calculated in 3X leveraged conditions based on an assumption that the price of Bitcoin moves up 1% daily. The results are shown in the graph below.

*Made by Gate.io Research*

According to the graph, in a bull market, the difference of the profits between margin trading at 3X-long leverage (the line in dark red) and 3X-long ETF (the line in light red) is insignificant, within the first 20 days. However, the difference widens as time passes. After a 100-day bull market, the profit of the 3X-long ETF experiences an

18-fold increase while the profit of the 3X-long margin trading sees a 5-fold upsurge. In the simulation, investors going short suffer from relatively huge losses, compared with those who go long. In the first 20 days, the losses resulted from 3X-short margin trading and 3X-short ETF show little difference. Nevertheless, as time goes by, the loss incurred by the latter dwindles to a lower level than that caused by the former.

It is concluded that in the one-sided market conditions, as for investors, they can achieve higher profits through an ETF than through margin trading at the same leverage level. Likewise, with wrong market predictions, those who invest in ETFs are exposed to smaller losses than margin traders. All these facts make ETFs excel more than margin trading.

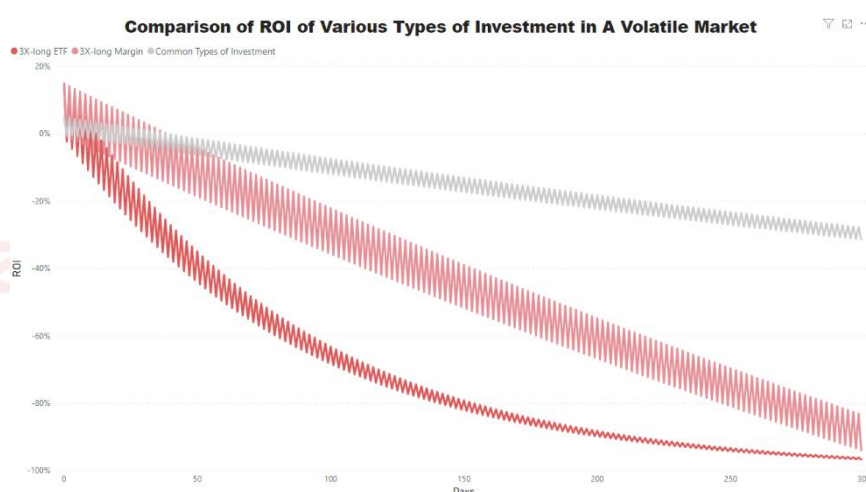
## 1.2 Leveraged ETF Investors Face Huge Losses in a Long-term Volatile Market Although Their Gains Multiply in the Short Term

The daily gain of leveraged ETF is amplified according to its leverage ratio since it tracks the daily return of indexes. Nevertheless, investors may not be able to make considerable profits from holding leveraged ETFs in the long run due to daily market fluctuations. In the chart below, the profits of spot trading, 3X-long margin trading, and 3X-long ETF are compared in different market conditions, so as to gain a clearer picture of the gain resulted from leveraged ETF in both one-sided and volatile markets:

April 2020

	BTC Price	ROI of Common Types of Investment	ROI of Margin3L	Net value of ETF3L	ROI of ETF3L
Initial Price	1	0%	0%	1	0%
Rose by 10% on the 1st Day	$1 \times (1+10\%) = 1.1$	10%	30%	$1 \times (1+10\% \times 3) = 1.3$	30%
Rose by 10% on the 2nd Day	$1.1 \times (1+10\%) = 1.21$	21%	63%	$1.3 \times (1+10\% \times 3) = 1.69$	69%
Fall by 10% on the 3rd Day	$1.21 \times (1-10\%) = 1.089$	8.9%	26.7%	$1.69 \times (1-10\% \times 3) = 1.183$	18.3%
Fall by 10% on the 4th Day	$1.089 \times (1-10\%) = 0.9801$	-2%	-6%	$1.183 \times (1-10\% \times 3) = 0.8281$	-17.2%

Based on the chart above, in a bull market, the profit of 3X-long margin trading is almost three times higher than that of spot trading. Investing in 3X-long leveraged ETF can achieve a higher level of profit than 3X-long margin trading. Nevertheless, if the Bitcoin price moves down by 10% a day, leveraged ETF investors will face a bigger loss than those who invest in the two. Therefore, it is summarized that their gains only multiply in the short run. The leveraged ETFs are not suitable for long-term investors. Given the recently fluctuating Bitcoin market, the profits in the chart below are calculated based on an assumption that the price experiences a daily fluctuation of 5% for 300 days.



Made by Gate.io Research

In view of the chart, for investors, their losses caused by the 3X-long margin trading are higher than that of spot trading.

Moreover, the biggest loss is shouldered by people investing in 3X-long leveraged ETFs. It can be concluded that in a volatile market, the loss triggered by the leveraged ETFs is way greater than that of spot trading and margin trading at the same leverage. It is not sensible to invest in the leveraged ETFs during such a market. For investors, they should mainly focus on short-term investments.

### 1.3 Leveraged ETFs Enjoy Lower Investment Risks Despite Their High Fees

For leveraged ETFs, their fee is higher than that of spot and margin trading. This is mainly due to two reasons. On one hand, as for investors involved in spot or margin trading, they are charged a lower fee by exchanges which only match orders, protecting their assets. On the other hand, professional investment managers are assigned by exchanges to pay close attention to markets, ensuring the daily profits of the leveraged ETFs equal to the amplified returns of their underlying indexes. Therefore, it is more energy-consuming to manage the leveraged ETFs, leading to a higher fee.

In regard to Gate.io, the fee of ETF products is 0.2% while spot trading is below 0.2% and contract trading is 0.075% for the taker. However, if investors can build and clear their positions within 24 hours, they are free from being charged for a daily management commission of 0.3%, since the commission is charged at 0:00 am every day. The fee is the only thing that they should pay for.

No liquidation occurs in terms of leveraged ETFs given extreme market fluctuations. Recently, given the dramatic drop of the Bitcoin price, the prices of underlying tokens of most ETF products in Gate.io had seen a plunge of over 40%, which far exceeded the 33% decline-resistance of 3X-leveraged ETFs, causing the forced liquidation of the hedge position in the Perpetual Contract. To avoid users' 3X-long assets returning to zero, Gate.io had immediately reopened the position after the forced liquidation. Their losses were covered by Gate.io.

#### 1.4 Conclusion

In trading, leveraged ETFs are commonly applied in hedging. For instance, an investor, with an assumption that the Bitcoin price is highly possible to go up despite a volatile market, will use the major proportion of his money to buy BTC in the spot market, leaving a small proportion to invest in 3X-short BTC ETF for hedging. In this way, if the price sees a huge upsurge, he can harvest considerable gains. His losses can be reduced with the 3X-short BTC ETF, in the case of the price going down.

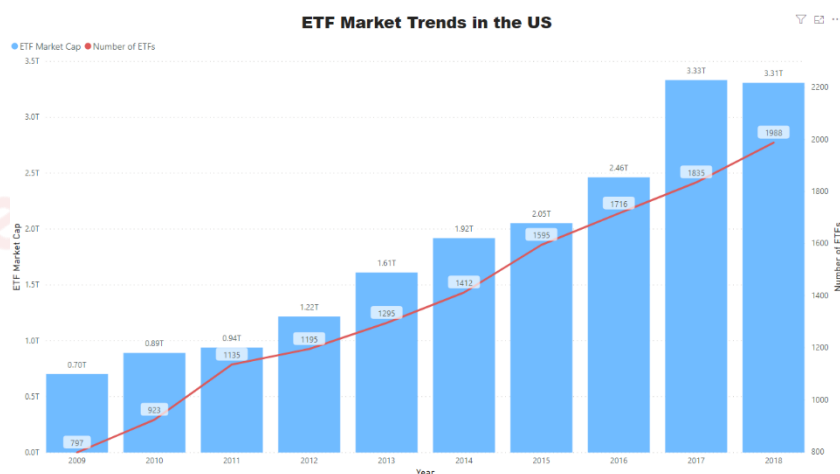
Generally speaking, leveraged ETFs have outstanding performance in one-sided markets while chances are that they will bring great losses to investors in fluctuating markets. Despite that, they enjoy a higher level of profitability yet low risks of liquidation during a bull market, which makes their fee higher, compared with margin trading. In conclusion, they boast unique advantages in terms of short-term investment.

## 2 Traditional and Crypto ETF Products

Traditional ETF products have undergone 20-year development while the birth of leveraged ETF products in crypto markets is less than 1 year. At present, lessons learned from developing traditional financial markets can serve as examples when it comes to building mature crypto ones. Both the conventional financial and crypto markets are compared in the following paragraphs so as to figure out their similarities and differences.

In 1993, SPDR, the first ETF product trading the S&P 500 index, was launched by the AMEX. Soon, ETF products gained worldwide popularity thanks to its affordability, low risks, transparency, as well as flexible and easy operation. At present, they have their places as investments. Nevertheless, crypto ETF markets are still far from being full-fledged as crypto ETFs are still in their infancy.

### 2.1 Crypto ETF Markets Are Fledgling alongside with Established Traditional ETF Markets



Source: ICI, Gate.io Research

In traditional financial markets, the most common ETF products are cross-border ETFs, commodities ETFs, equity ETFs, bond ETFs, and

currency ETFs. According to the latest 2019 Investment Company Fact Book, released by ICI, the US ETF market is the biggest in the world, with 1,988 ETF products and a total net asset of 3.4 trillion USD. Moreover, it posts an annual growth rate of about 17.71%, occupying 71% of the world's market shares, which is 4.7 trillion USD in total.

When it comes to crypto ETF products, only dozens of them, whose underlying tokens are mainstream cryptocurrencies, are available, which means the size of the Crypto ETF markets are far smaller than that of traditional ETF markets. In conclusion, Gate.io Research believes that crypto ETF products are still in their initial development stage. Therefore, their development in the future may share similarities with that of traditional ETF products. It is expected that more crypto ETF products will be available in the future.

## 2.2 The Fee of Crypto ETF Products is Higher than That of traditional ones

In traditional financial markets, ETF products are managed by assigned fund managers from fund companies. Furthermore, banks are responsible for the asset custody of users, preventing managers from misappropriating the asset. Professional index companies are involved in providing real-time indexes since these products track the indexes of their underlying assets. All these facts contribute to the higher fee of ETF products than that of average funds. At present, the average fee of equity ETFs in the US market is 0.21% with a median of 0.48%. For equity assets, their average fee is 0.09% with a median of 0.33%.

As mentioned above, the average fee of traditional ETF products is lower than that of crypto ETF products, which is 0.3%. In spite of that, charging more for crypto ETF products is well-grounded given the fact that they are traded around the clock in extremely volatile markets. However, as they continue to thrive, more crypto ETF products with lower leverage or a stablecoin index may emerge, in order to minimize the risks faced by their investors.

### 2.3 The Trading Rules of Traditional ETFs Are More Flexible than That of Crypto Ones

Traditional ETF products can be traded on exchanges or over the counter. For floor traders, it is necessary for them to buy baskets of the underlying stocks so as to exchange them for ETF shares. For instance, in China, floor traders should purchase at least 1 million ETF shares, whose price depends on the NAV of the fund, for the redemption of the underlying stocks. As for OTC ETF trading, investors can buy ETF shares through a direct purchase from the ETF issuers or distributors. Moreover, buying 100 shares of the underlying stocks is enough to purchase ETF shares, which is relatively a minor cost for small investors.

By far, crypto ETF products can be traded on cryptocurrency exchanges only. Nevertheless, there is no purchase threshold for crypto ETF buyers. The asset custody and operation are managed by the exchanges. Gate.io Research thinks it is possible that both

OTC trading and floor trading of crypto ETFs will be enabled. In other words, crypto ETFs will be only available to the investors with a large share of the underlying tokens. Crypto ETF buyers can purchase various ETF products to create a new one. It can be listed on crypto exchanges after being reviewed by them.

## 2.4 Conclusion

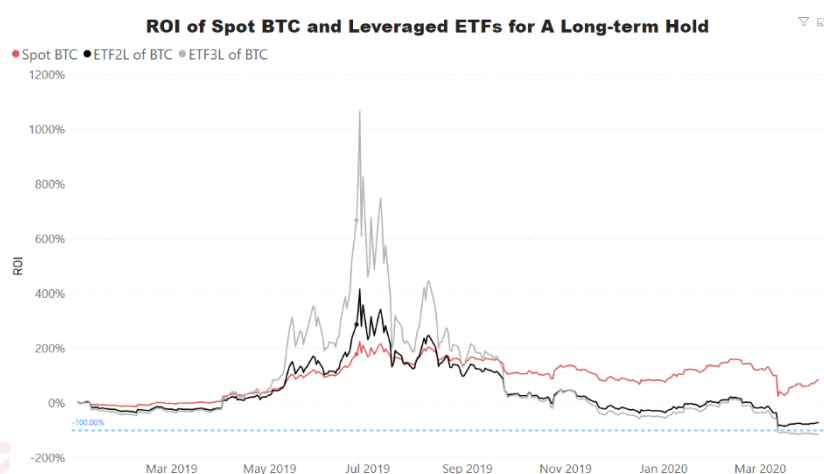
All in all, it is extremely obvious that crypto ETF products are in their initial development stage in terms of their market size, fee, and trading rules, compared with traditional ones. In the future, new and better crypto ETF products will emerge with optimized management and more trading rules, based on the development of traditional ones.

## 3 Benefits and Risks of Leveraged ETFs

A highly volatile cryptocurrency market brings higher risk with a greater probability of return and vice versa, on its derivatives such as leveraged ETFs. On top of that the longer investors hold ETFs, the riskier it becomes. The report is going to analyze the relationship between return and risk when investors hold ETFs for different lengths of time, in order to comprehensively demonstrate the pros and cons of leveraged ETFs.

### 3.1 Longer Time of Holding Leveraged ETFs Brings Higher Risk

Among regular investments, even though ETFs come with higher risk, leveraged ETFs are more than that. In order to compare the return on spot and leveraged ETFs between cryptocurrency and traditional finance, BTC, 3x-long, and 2x-long leveraged BTC ETFs, NASDAQ representing American Stocks and NASDAQ 100 3x-long leveraged ETFs are selected as samples for analysis. Considering cryptocurrency ETFs are still in the middle of development, there is limited public history data. Therefore, history data of BTC spot price is used to calculate the ROE of 2x-long and 3x-long leveraged BTC ETFs (management fee of 0.3% has been taken into consideration). The date range of data selected is from the beginning of January 2019 to April 7, 2020 (The data is provided for information only and is not investment advice)

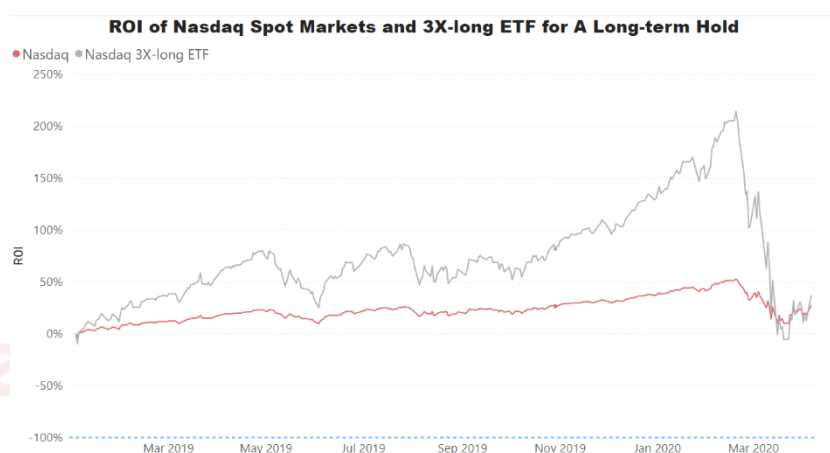


The simulation results demonstrate that the price of BTC soared on the earlier

stage, and investors holding 3x-long leveraged ETFs had the highest return of 10 times. However as the market fluctuated and price decreased, the return on leveraged ETFs dropped dramatically. On March 12, the loss ratio of 3x-long leveraged ETFs was over

April 2020

100%, partial liquidation (accounts will not be fully liquidated since exchanges will bear partial loss). Based on the analysis, 3x-long leveraged ETFs is a product with extremely high risk in the current volatile cryptocurrency market. Gate.io might consider launching 2x-long leveraged ETF products in the future and hence investors can choose their investments according to their needs.



Source: cn.investing.com, Gate.io

#### Research

The simulation results of NASDAQ show that spot price grew steadily on the earlier stage, and as a result, the

gains on ETFs rose gradually as well. Whereas the pandemic started to explode in the US in February, NASDAQ plummeted and caused several “stock plunges”, and meanwhile the price of 3x-long leveraged ETFs fell sharply. Nevertheless, the market bounced back a bit as time went by and the return on 3x-long leveraged ETFs was slightly higher than spot eventually. NASDAQ spot showed an upward trend in 2019 with mild volatility and its ETF products performed well, while ETF prices fell off a cliff due to the pandemic, which has exposed its weakness of higher risk under tumbling market circumstances.

To compare the gains on ETFs between cryptocurrency and NASDAQ, the charts below show returns and risks of different products in various quarters.

The simulation results of NASDAQ show that spot price grew steadily at an earlier stage, and as a result, the gains on ETFs rose gradually as well. Whereas the pandemic started to explode in the US in February, NASDAQ plummeted and caused several “stock plunges”, and meanwhile the price of 3x-long leveraged ETFs fell sharply. Nevertheless, the market bounced back a bit as time went by; the return on 3x-long leveraged ETFs was slightly higher than spot eventually. NASDAQ spot showed an upward trend in 2019 with mild volatility and its ETF products performed well, while ETF prices fell off a cliff due to the pandemic, which has exposed its weakness of higher risk under tumbling market circumstances.

To compare the gains of ETFs between cryptocurrency and NASDAQ, the charts below show the returns and risks of different products in various quarters.

	Quarter	Spot BTC	Margin3L of BTC	ETF3L of BTC	ETF2L of BTC	Nasdaq Index	Nasdaq ETF3L
Maximum ROI	2019 Q1	3.22%	3.30%	1.76%	1.18%	17.80%	58.77%
	2019 Q2	206.81%	1863.89%	1416.71%	536.55%	4.91%	14.86%
	2019 Q3	17.99%	54.64%	50.97%	33.15%	3.20%	9.09%
	2019 Q4	13.32%	28.49%	18.13%	13.10%	14.24%	46.44%
	2020 Q1	47.92%	195.81%	161.53%	87.60%	9.54%	29.96%

Source: cn.investing.com, Gate.io. as of April 7, 2020; made by Gate.io Research

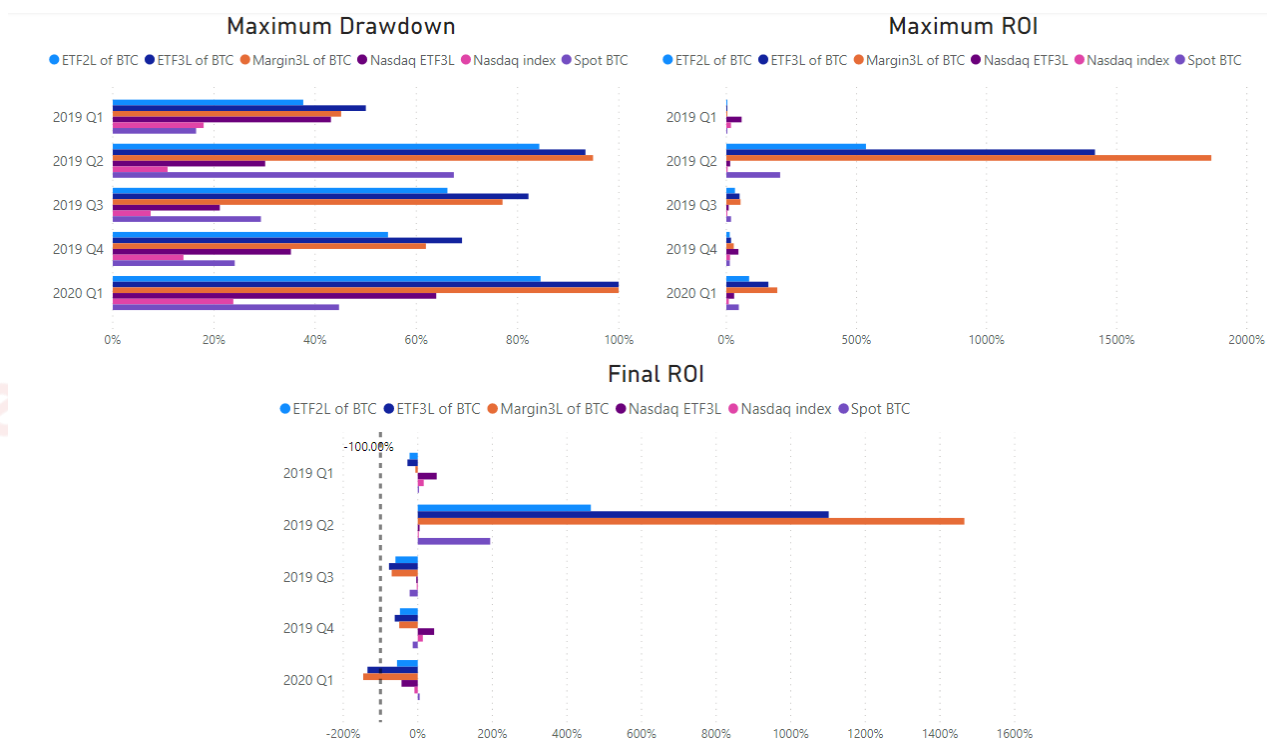
	Quarter	Spot BTC	Margin3L of BTC	ETF3L of BTC	ETF2L of BTC	Nasdaq Index	Nasdaq ETF3L
Final ROI	2019 Q1	3.22%	-6.36%	-27.69%	-21.93%	16.00%	50.81%
	2019 Q2	194.25%	1465.41%	1101.71%	464.04%	2.58%	4.89%
	2019 Q3	-21.69%	-69.93%	-77.12%	-59.85%	-0.24%	-4.05%
	2019 Q4	-13.52%	-49.66%	-61.71%	-47.74%	13.65%	43.91%
	2020 Q1	5.10%	-146.29%	-134.80%	-55.63%	-8.91%	-43.53%

Source: cn.investing.com, Gate.io. as of April 7, 2020; made by Gate.io Research

April 2020

	Quarter	Spot BTC	Margin3L of BTC	ETF3L of BTC	ETF2L of BTC	Nasdaq Index	Nasdaq ETF3L
Maximum Drawdown	2019 Q1	16.48%	45.13%	50.01%	37.65%	17.96%	43.12%
	2019 Q2	67.41%	94.91%	93.41%	84.29%	10.84%	30.13%
	2019 Q3	29.28%	77.02%	82.15%	66.13%	7.50%	21.16%
	2019 Q4	24.11%	61.88%	69.02%	54.39%	13.98%	35.21%
	2020 Q1	44.71%	100.00%	100.00%	84.54%	23.83%	63.92%

Source: cn.investing.com, Gate.io. as of April 7, 2020; made by Gate.io Research



Source: cn.investing.com, Gate.io. as of April 7, 2020; made by Gate.io Research

By comparing 3x-long leveraged BTC with 3x-long leveraged ETFs, it is shown that the former has a higher return than the latter most of the time, meanwhile with slightly lower maximum drawdown (MDD), as a result of daily management fees and the high leveraged loss of ETFs. From this point of view, leveraged ETFs do not perform better than regular leveraged products. Furthermore, during actual trading, investors should be cautious

with leveraged products since the process is relatively complicated, which also requires interest for the loan and collateral, etc.

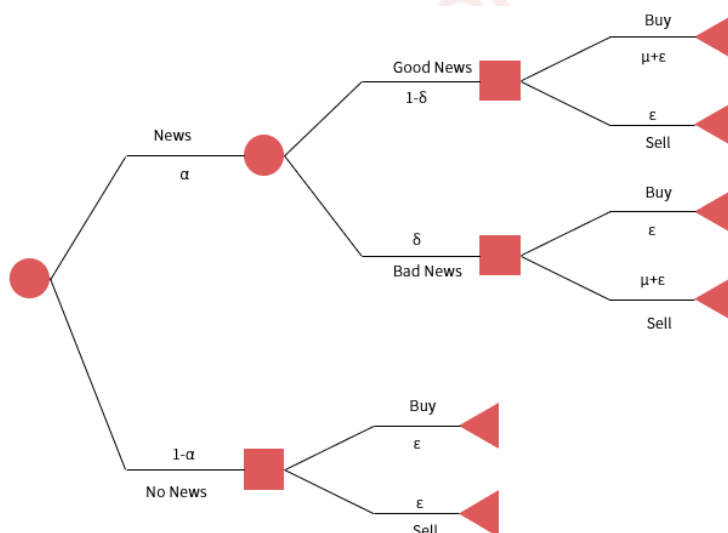
The comparison between cryptocurrency and NASDAQ ETFs shows that the former has a higher risk due to the volatility of cryptocurrency. Other than that, when a price crash happens, it even leads to exchanges bearing partial loss for investors. Nevertheless, higher risk means a greater possibility of gains. It is illustrated in the diagram where 3x-long leveraged BTC ETFs achieved 14 times the profit rate in the second quarter of 2019. Hence, short-term holdings bring a greater probability of higher returns. Based on the analysis, **cryptocurrency ETFs are more suitable for short-term holdings.** The following context simulates the return on short-term investments using the VPIN model.

### 3.2 Forecast on Short-term Gains using VPIN

VPIN is a mathematical model often used in traditional finance to predict derivatives markets, which is based on PIN (Probability of Informed Trading) model. The tree figure below is a PIN model demonstrating the different kinds of information events. They are “no information” , being no news, and “information” which includes good news and bad news. If there is no news, only uninformed traders trade. However, if there is news, both informed and uninformed traders trade, and moreover the former would buy or sell

April 2020

according to the news. As a result, transactions of informed traders lead to volatility of the market, which means there would be net buying or net selling:



Note: " $\alpha$ " is the probability of the informed trading, and " $\epsilon$ " is the probability of non-informed trading

### 3.2.1 VPIN Model Can Effectively Predict Short-term Returns

In the VPIN model, sample trading volumes are divided into volume buckets. Take Gate.io for instance. Data of every transaction from the beginning of 2018 to April 7, 2020, is collected, with a total of about 16 million transactions sorted into 1 million minute-by-minute data. The annual trading volumes are shown in the chart below:

Year	2018	2019	2020
Trading Volume (BTC)	253661.09	629760.03	245127.95

Source: Gate.io, as of April 6, 2020; made by Gate.io Research

The sample data of 2018 is used to calculate the daily average trading volume. If there are 50 volume buckets, the bucket size would be  $253661/365/50 = 13.90$ . For a certain bucket, the buying and selling volumes would be:

$$V_{\tau}^B = \sum_{i=t(\tau-1)+1}^{t(\tau)} V_i * \Phi\left(\frac{\Delta P_i}{\sigma_{\Delta P_i}}\right)$$

$$V_{\tau}^S = \sum_{i=t(\tau-1)+1}^{t(\tau)} V_i * \left[1 - \Phi\left(\frac{\Delta P_i}{\sigma_{\Delta P_i}}\right)\right]$$

$V_i$  is the trading volume at the time of  $i$ , where BTC trading volume in 1 minute is obtained.  $t \in [(\tau-1)+1, \tau]$ ,  $\Phi$  is the cumulative distribution function of the standard normal distribution, namely CDF.  $\Delta P_i$  is the change in price of the interval, namely price changes in minute data.  $\sigma_{\Delta P_i}$  is the standard deviation of price changes.

VPIN is the ratio comparing the imbalanced trading volumes of  $N$  buckets to total trading volume. The formula is as follows:

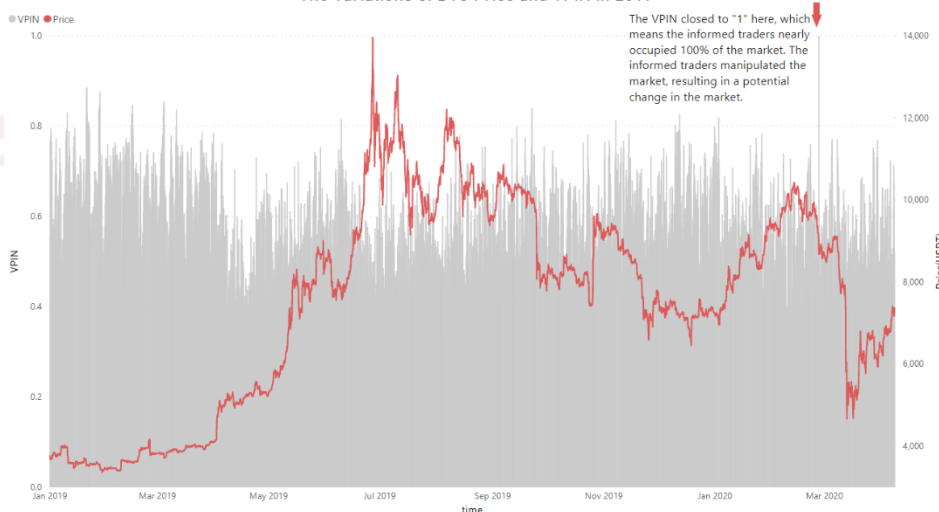
$$VPIN \approx \frac{\sum_{\tau=1}^N (|V_{\tau}^B - V_{\tau}^S|)}{N * VBS}$$

$N$  is the number of buckets; it is set as 50. VBS means Volume Bucket Size.

Over 600 thousand minute-by-minute data from Gate.io dating from the beginning of 2019 to April 7, 2020, is calculated using the VPIN model below:

April 2020

The Variations of BTC Price and VPIN in 2019



Source: Gate.io

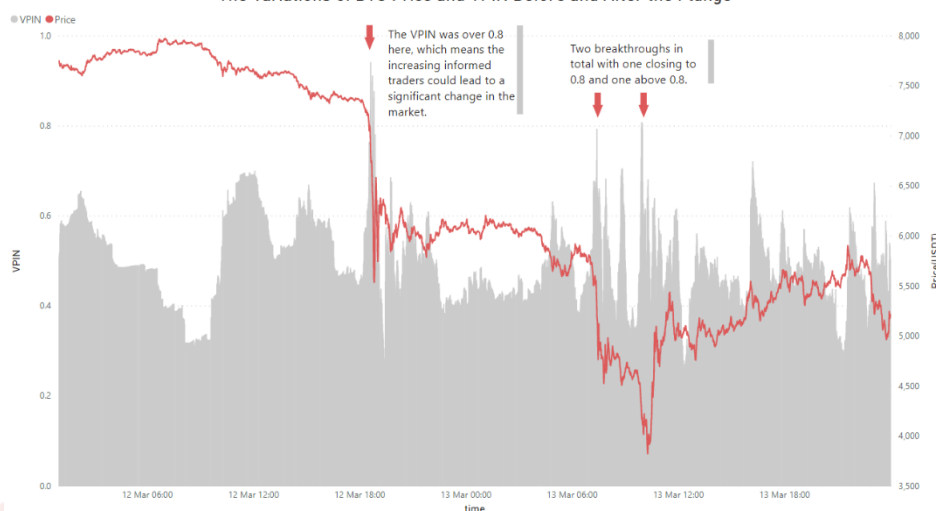
Research

It is shown in the diagram that the VPIN metric is close to 1 in March, which indicates that the

market is manipulated by informed traders.

In order to acquire better anticipation of short-term performance with VPIN, the diagram below shows the relation between VPIN metric and BTC price on the day before and after March 12, 2020:

The Variations of BTC Price and VPIN Before and After the Plunge



Source: Gate.io Research

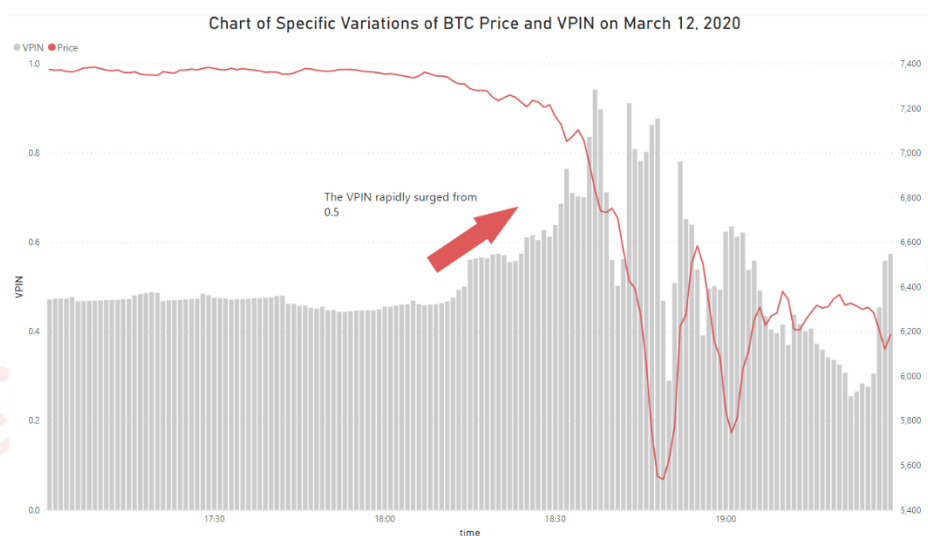
Based on the results, the VPIN metric reached 0.8 and was close to 1 before 6 pm Beijing Time on March 12, which means the market was full of informed

traders. At around 6 pm of Beijing time on March 13, VPIN again got close to 0.8, but the

April 2020

market tumbled afterward. However, VPIN exceeded 0.8 at around 9 am on the same day and institutions bought low-cost shares resulting in market reversal.

In order to show better anticipation by VPIN, the diagram shows the changes in VPIN before and after 6 pm of Beijing time on March 12, 2020:



Source: Gate.io

Research

Based on the results, VPIN surged at 6 pm immediately followed by a BTC price drop, which shows VPIN

has a better prediction regarding short-term investments.

### 3.2.2 Predict High-Frequency Trading (HFT) of Leveraged ETFs using VPIN

Regarding VPIN on BTC, most of the time, it is between 0.4 and 0.6, which means half of the current BTC transactions are informed trading. If VPIN surges suddenly and the market price is relatively low, there is a higher chance that informed traders would go long on BTC. However, if the market price remains high or volatile at a high price, there is a higher chance that they would go short on BTC.

Based on the results of spot BTC using the VPIN model, it is believed that the trading strategy model can be built to verify if VPIN also works well in predicting ETF. Since ETF fluctuates in accordance with spot price, BTC spot price and trading volume are used to calculate VPIN. When VPIN is greater than a specified threshold value and keeps an upward trend, it is considered that the market will change in the near future. If ETF short-term price outnumbers the long-term, there is a great probability that market price increases, and vice versa.

Gate.io uses ETF moving average (MA) to analyze market trends. Meanwhile, a linear regression model is applied to determine if spot VPIN grows rapidly in 15 minutes, calculated every minute. A trading strategy model is built as follows (The model is provided for information only and is not investment advice):

1. If short-term MA is higher than the long-term, and the slope of the line is above 0 with VPIN predicted value above 0.7, then it is suggested to buy 3x-long leveraged ETFs.
2. If short-term MA is lower than the long-term, and the slope of the line is above 0 with VPIN predicted value above 0.7, then it is suggested to sell 3x-long leveraged ETFs.
3. Buy in batches with 25% of cash each time, total 4 times of buying at most.
4. Sell in batches of 25% each time, total 4 times of selling at most.

April 2020

- If the fourth selling happens, all holdings are sold so investors need to start a new round of buying to hold ETFs.

Short-term MA implies a one-hour period while long-term MA implies four hours'. The model conducted uses BTC spot price to simulate 3x-long leveraged ETFs (If ETF is liquidated, exchanges bear 50% of the loss). Daily management fees and single transaction fees are already taken into considerations. The simulation results are as follows (The simulation is provided for information only and is not investment advice):



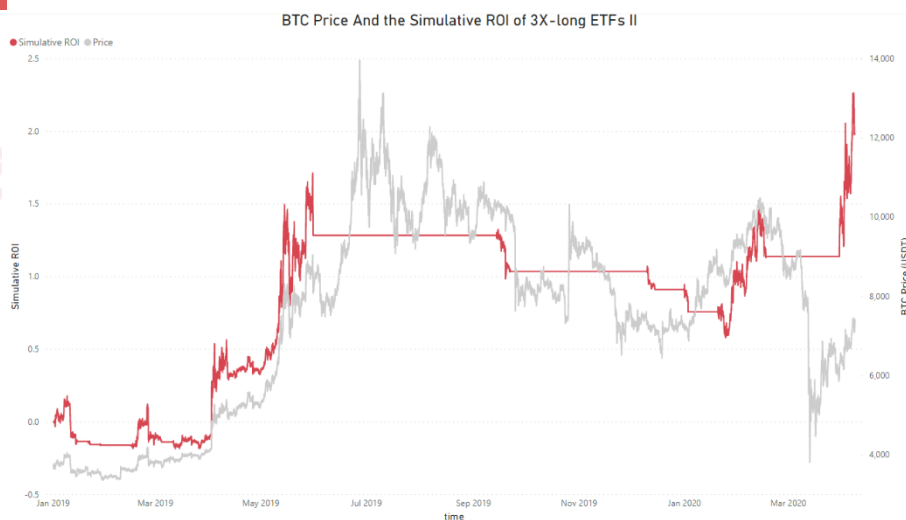
Source: Gate.io Research,  
as of April 7, 2020

Based on the results, it is shown that with VPIN metrics in the simulation, ETF achieves good gains,

and meanwhile, the risk of revocable transactions has been lowered dramatically.

However, the profit is still a bit lower than the price range of BTC spot. Considering the strategy could be used in a more flexible way, the simulation below uses a higher VPIN 0.8, and buying and selling batch is adjusted to 20%, a total of 5 times of transactions. The results are as follows:

April 2020



Source: Gate.io Research,  
as of April 7, 2020

Based on the results, it is shown that with higher VPIN and smaller batch of each transaction, ETF achieves better gains,

and meanwhile, the profit surpasses the price range of BTC spot. In real trading, investors can experiment on different parameters, different VPINs, use short-term and long-term MAs of more frequent periods, or use smaller batches with more transactions. Consequently, they can select appropriate parameters to build the model according to price range and maximum drawdown (MDD). Investors can also consider buying 3x-short ETFs of the same amount if they sell 3x-long ETF positions, which might bring greater profits.

### 3.3 Conclusion

By studying simulations of profits of leveraged ETFs, it is found that there is a higher risk due to the volatility of cryptocurrency. Therefore, leveraged ETFs are more suitable for short-term investments. The VPIN model is usually conducted in traditional finance to predict derivatives trading, so the report uses VPIN to construct simulations on short-term leveraged ETF profits. Based on the results, VPIN works better on predicting short-

term ETF profits, and properly using VPIN simulations to predict high-frequency trading (HFT) could result in greater profits.

## 4 Conclusion

By comparing it with the US ETF industry whose net value accounts for 3.4 trillion USD of the market, it seems that the current crypto ETF market is still young as it lacks a wide variety of types and incurs high handling fees. However, as a new investment product that is featured with high profits in a singular market move and substantial losses in a volatile market, the crypto ETF is an appropriate choice for the short-term investment and hedge trading.

In the analysis of various investment products for a long-term hold, it can be seen that a violently volatile crypto spot market poses serious threats to the leveraged ETFs and even causes potential losses of the exchanges. Nevertheless, as the high risks always come with high profits, the crypto ETFs still draw a considerable number of investors to the market, especially in 2019 Q2 when a bullish market could have helped investors gain up to 14 times their Return on Investment (ROI) according to the above simulation.

Given that the leveraged ETF is not suitable for a long-term hold, Gate.io has built a VPIN model that is commonly used in the traditional derivatives market and calculated the VPIN coefficient to observe the proportion of the informed traders so as to anticipate the

potential variation of the market. In accordance with the results, a leveraged ETF trading that refers to the VPIN coefficient is more likely to bring about larger profits as well as lower drawdown.

To conclude, the crypto ETF, as a new type of financial product, has injected more vitality into the crypto market. However, it has not been approved by Law in any country at present. In addition, the SEC (the U.S. Securities and Exchange Commission) has repeatedly rejected the applications of ETFs from the exchanges. Therefore, in terms of supervision, a high-risk ETF trading entails the support and lead of the supervision organizations for a prosperous future.

## Reference

- [1]. 交易型开放式指数基金 ETF 如何实现套利.中国经济网,2015
- [2]. 2019 Investment Company Fact Book.:ICI,2019
- [3] Marcos M.Lopez De Prado. Advances in High Frequency Strategies (2012), 76-80
- [4] 张晨.基于 VPIN 的实证研究及高频交易策略设计[D].:山东大学,2018.05.30.

April 2020

---

## Disclaimer

Following disclaimers are made in regard to the above research:

- Based on due diligence and objective analysis by internal staff, the research analyzes the development status of crypto ETFs and should not be treated as the sole basis to predict the market trend of crypto ETFs.
- The research is not a tool to evaluate the value of the research object or tokens is released. It does not constitute any basis for investors to make final investment decisions.
- Project Information quoted in the research is collected through methods that are considered trustworthy and accurate by internal staff Information. Accuracy is subject to availability, because manual or mechanical errors may exist. No implicit or explicit statements or guarantees will be made as for the authenticity, correctness, completeness, and timeliness of related data in the report