Crypto Options Market: History, Present and Future

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Content

Preface

Seven years have passed since the official emergence of crypto options.

During these seven years, the crypto-asset market has gone from a geeky, non-mainstream niche to a behemoth with more than a 3 trillion dollar market cap. The crypto options market has become a seemingly small but integral part of growing.

Many financial products are all backed by a large number of options contracts. Investor sought-after structured products(dual currency investment, shark-fin options, theta vault, etc.) are built with options. Market makers and asset management funds use risk reversal portfolios based on options to hedge against risky positions. Various fixed income products, zero-interest lending products, and risk-free products available on the market are also supported by options.

As the market expands, crypto-asset options positions are rapidly increasing. In 2022, the market will rival major options products in the European and American capital markets, with market liquidity sufficient to support asset management-related needs of more than 100 institutions in the options market.

Unlike other components of the crypto-asset derivatives market, the high threshold of the options market and first-mover advantages have led to a relatively significant flow aggregation effect in the options market. In Q4 2021, Deribit held 87% of the options market, with crypto asset managers such as Amber Group, Babel, Matrixport, GSR, and QCP Capital all entering options-related transactions primarily on the Deribit exchange.

Preface

The on-chain options market is a new attempt to de-centralize options on crypto assets. Since the on-chain options market's independence from the insurance market in 2020, more than 50 options projects have explored various aspects of contract mechanism design, liquidity, and products. Finally, a market pattern of 'focusing on structured products, OTC trading, and risk hedging' has formed. At the same time, many innovations are made in the direction of options-like products, structured products, etc.

2022 may represent a new growth opportunity for the crypto asset options market, despite the macroeconomic tightening cycle already underway. On the one hand, investors tend to favor products with substantial and relatively stable returns in an overall weak market. The management and hedging of risk have become the market's focus again. At the same time, as the crypto asset market matures and the overall market volatility tends to decline, many exchanges have launched options products for more underlying assets to meet market demands. Additionally, options-like products represented by "Squeeth" are more adaptable to the on-chain environment and bring new possibilities to the on-chain option market while having some of the benefits of options.

We look forward to the performance of the crypto-asset options market in the coming year.

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Crypto Options Market Overview

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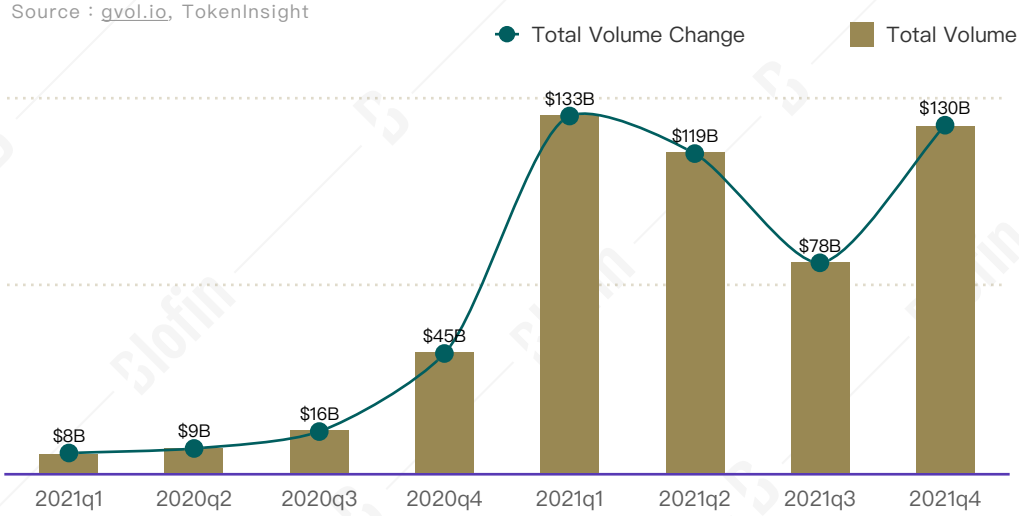
Crypto options' trading volume is low as a percentage of market-wide trading volume, only 0.41% in 2021, but trading size expands nearly 6 times compared to 2020.

Compared to the spot and delta 1 markets, where trading volumes are often measured in $T, the options market is just a corner of the crypto market. In 2020, the trading volume of the options market accounted for just 0.23% of total trading volume, or slightly more than $77.2b. In 2021, the options market's share rose to 0.41%, with an annual trading volume of $460.67b.

The scale of options trading has expanded relatively rapidly in the last two years. In 2020H1, the quarterly trading volume of options did not exceed $10b. However, since 2021, the volume has exceeded the level of $100b, and the annual trading volume expanded nearly 6 times compared to that of 2020, expanding at a rate comparable to the perpetual swaps market. In comparison, both the spot and futures markets only grew by about 2.3 times in 2021 in terms of the trading volume.

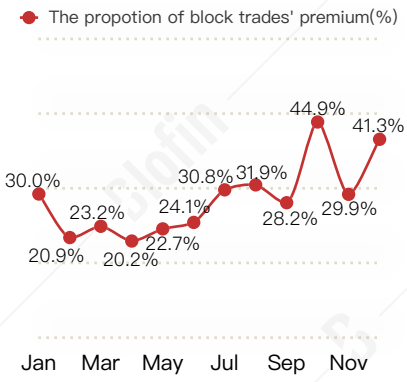
2020-2021 Crypto Options Market Quarterly Trading Volume Change

Source：gvol.io, TokenInsight



Block Trades of Crypto Options Market in 2021

Source：gvol.io, TokenInsight



Block trades (a single options transaction notional value greater than 25 BTC/250 ETH) play an essential role in the crypto options market. In 2021, Block trades contributed 29.6% (nearly $4.4b) of the market's total premiums, especially in October and December, when block trades generated more than 40% of the total premiums for the month. From the underlying perspective, block trades account for an even higher percentage of the BTC options market, accounting for more than 30% of the total for the year. In October and December, block trades even account for more than half of the BTC options market. In contrast, the share of block trades in the ETH options market typically remains around 22% in 2021.

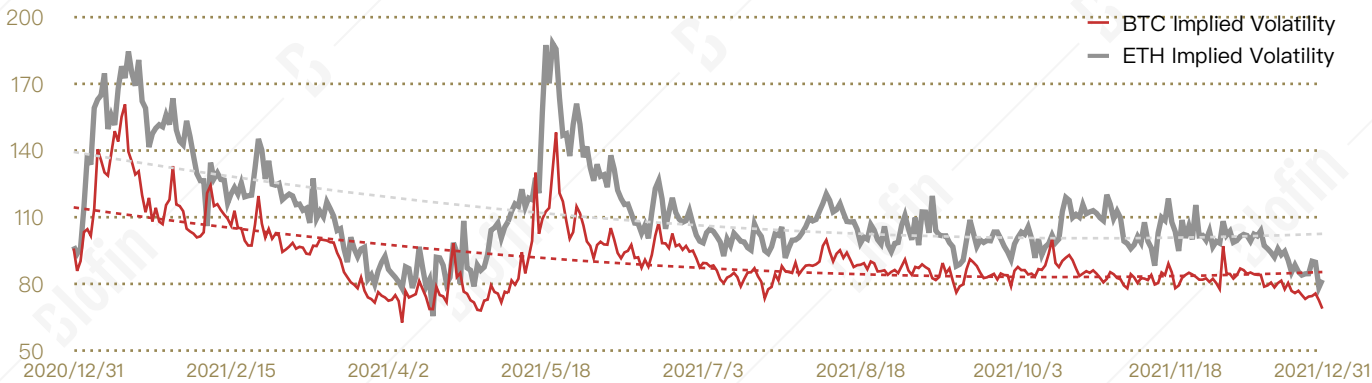
In 2021, mainstream crypto options implied volatility shows a significant downward trend, perhaps related to the institutionalization of the market and the increase of sellers.

As one of the main pricing indicators for options prices, the direction of implied volatility directly reflects the direction of the options's "fair price" and is reflected in the yield.

In early January 2021, the weighted implied volatility of BTC and ETH options rose to over 140 and 170, respectively, due to the sharp market shakeup triggered by the bull market in crypto assets, and then both fell to around 80 in April. In May, the implied volatility of BTC and ETH rose sharply to the same level again due to regulation and then diverged. Before December, the implied volatility of ETH options remained stable at a high level of around 100, while the implied volatility of BTC options remained around 85. In December, both implied volatilities went into a rapid decline mode, dropping to below 80 at the end of the year.

Mainstream crypto options' implied volatility changes in 2021

Source：gvol.io, TokenInsight



Overall, implied volatility showed a significant downward trend throughout the year. The increasing institutionalization of the market in 2021 is one of the reasons. Institutional market-making and trading account for about 80% of the annual trading volume, with the top largest market maker already accounting for more than 10% of the trading volume.

In addition, the increase of the options sellers due to the expansion of the market size is also one of the essential influencing factors. Take Deribit exchange as an example; compared to 2020, in 2021, the number of Deribit users grew by more than 6 times, trading BTC options contracts to more than 5m and ETH options contracts more than 36m. This growth helps form a large-scale sellers group. The competition between sellers further depressed options prices, leading to a decline in implied volatility.

Relatively high options return risk in 2021H1, but stabilizing since 2021H2.

Typically, institutional options strategies are primarily sell-side, time-value strategies, known as "theta strategies". Theta strategy is more sensitive to realized volatility, for realized volatility is an abstraction of the actual range of price volatility, while implied volatility is an abstraction of the expected range of price volatility. When price volatility exceeds expectations, options sellers are vulnerable to losses.

In the 2021H1, the market was relatively volatile. As for the Theta strategy, despite its high theoretical return, tends to suffer from rapid price increases/ decreases in actual returns. After June, the realized volatility has rapidly declined, and implied volatility is relatively high due to strong investor demand for options, thus delivering a more desirable real return.

Mainstream crypto options implied volatility – realized volatility spread changes in 2021

Source：gvol.io, TokenInsight

Despite the downward trend in implied volatility throughout 2021, the overall implied volatility-realized volatility differential for both BTC and ETH options is trending upward. **The fact above means that the returns in the options market tend to stabilize.** Due to the significant decline in realized volatility, there are fewer situations of market volatility to exceed expectations. As a result, even though options prices have declined, the probability of an options being exercised is still significantly lower. At the same time, the continued theta profits provide investors with a more stable cash flow.

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History of Crypto Options Market

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The crypto options market arose in 2014–2015, formally emerged in 2016, and entered a rapid development phase around 2020.

Initial Stage: 2015–2018

Attempts at crypto asset options related products can be traced back to 2015 when Bitcoin options were launched by bitsquan.com, but it did not gain much traction in the market at the time.

Deribit Exchange's launch of Bitcoin options in 2016q2 was the first complete options contract product in the history of cryptos. Subsequently, in 2017, LedgerX launched physically delivered bitcoin options, also the first compliant crypto options product. However, since then, the options market has been affected by the bear market, and development has stagnated.

Overall, investors had little understanding of options trading, for the crypto derivatives market was not well-developed and primarily linear. The early options market had two main characteristics: single underlying (only BTC options) and limited liquidity. Moreover, when the first crypto options products were launched, the lack of market makers and low investor demand for options created a severe lack of liquidity.

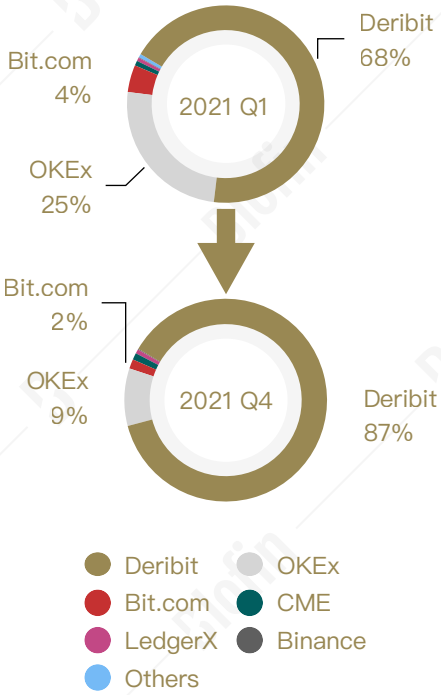
For this reason, at the beginning of the crypto options's launch, Deribit could only channel the options market through perpetual and futures contracts. Besides, They also used the margin interoperability mechanism to reduce the cost of trading for users, thus gaining the initial group of options users. In contrast, LedgerX's liquidity was stretched even further by U.S. compliance requirements.

Developing Stage: 2019–2021

In 2019q1, the launch of Deribit ETH options marked the advent of the development phase of the crypto asset options market. With the booming crypto derivatives market in 2020, the options market also entered a rapid development phase. In late 2019, Bakkt launched BTC options. The Chicago Mercantile Exchange (CME) launched BTC options in early 2020. In the same year, Binance, Huobi, OKEx, FTX, Bit.com, Bitwell, and other exchanges entered the crypto options market.

Market Share Changes of Crypto Options Exchanges in 2021

Source: gvol.io, skew, TokenInsight



However, due to regulatory and business restructuring, Bakkt and Huobi exited the options market in mid-2020 and mid-2021. Besides, LedgerX was acquired by FTX at the end of October 2021 and became part of FTX.US Derivatives. In contrast, new exchanges such as Delta Exchange and Stormgain joined the crypto options market competition in 2021.

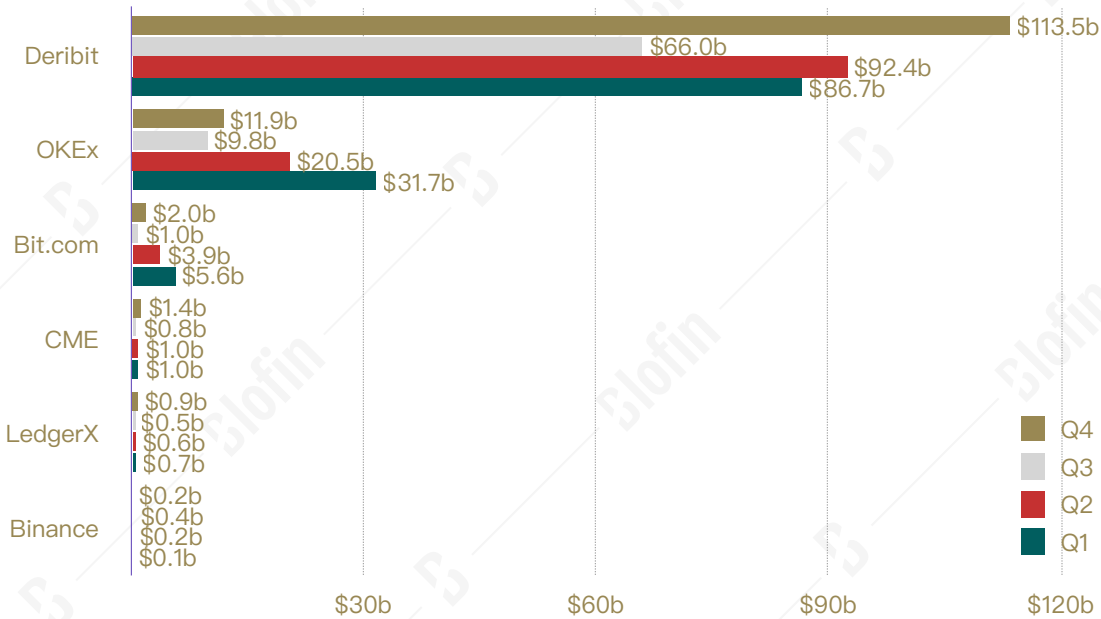
Every exchange adopted various ways to attract users to the options market during this phase. For example, to lower the barrier to users, Binance allowed users to act only as buyers, while FTX used an OTC form of options trading called "quote trading". However, the market response to each means has been relatively neutral from a trading volume perspective.

In 2020H2, benefiting from the further development of decentralized finance on the chain, on-chain options trading also began to appear in the form of "insurance", such as Opyn, Opium Network, etc. The first formal options projects, represented by Opyn V2, were launched at the end of 2020.

As of February 2022, there are more than 35 decentralized options projects offering products, including but not limited to European options, American options, exotic options, etc., with a total lock-up volume of over $750 million. Many projects have also explored other possible directions, like perpetual options and options-like products. However, sellers involved in on-chain options trading are mostly structured product providers who profit from selling options products in packages for security, liquidity, hedging costs, and other considerations.

2021 Quarterly Changes in Trading Volume on Main Crypto Options Exchanges

Source : gvol.io, TokenInsight



Competition in the crypto options market is heating up in 2021. Deribit exchange saw a significant decline in market share, falling from 83.16% in 2020H2 to 68% in 2021q1. Meanwhile, OKEx once held more than 25% of the market.

However, the share of previously Chinese client dominated exchanges such as OKEx and Bit.com declined rapidly under the regulatory onslaught in mid-2021. By 2021q4, the market share of OKEx exchange trading volume shrank to below 10%, while Deribit captured 87% of the market and surpassed $100 billion in quarterly notional trading volume for the first time, cementing its dominance in the options market.

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Type of Crypto Options Contract

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Liquidity remains at the heart of options products, with other factors taking a back seat.

Currently, investors trade mainly BTC and ETH options, usually primarily coin-margined options. Although exchanges such as Delta Exchange, Bit.com, and BitWell have made some attempts at options on altcoins, there are relatively few traders, and daily trading volume is usually below $1 million.

Coin-Margined Options

Unlike other derivatives markets, most options contracts traded in the market still use crypto for settlement as of 2021q4. Exchanges using a coin margined contract include mainly Deribit, OKX, and Bit.com, while the share of coin margined contracts traded in the market exceeded 95% in q4.

The popularity of coin-margined options is inextricably linked to the composition of the early user of options in the crypto market. Early adopters of options were mainly miners of BTC and ETH, who used options to hedge against price movements and lock in their profits. The miners hold many BTC/ETH and other cryptos in their hands. In addition, miners prefer crypto assets and therefore prefer to trade and settle via them.

USD Stablecoin-Margined Options

The number of options exchanges that quote, price, and settle in the USD stablecoins (for example, USDT, USDC) instead of coins is increasing. As of February 2022, at least three exchanges (CME, Delta Exchange, and FTX.derivatives) have already offered USD-margined options contracts, and Deribit will also launch USD-margined options products in 2022. However, the trading volume of USD-margined options is relatively low, and there is still a significant gap in the market acceptance compared to the coin-margined options.

Compared with coin margined options, USD stablecoin-margined options are relatively simple and easier to understand in calculation and settlement. Meanwhile, USD margined options have certain advantages on the compliance side: both CME and FTX.Derivatives use USD for denomination and settlement.

The options contract elements for each exchange are shown in the table below.

Contract Elements of the Crypto Options (Part 1)

Source: Websites of exchanges, Note: Coin* indicates that the product is denominated and settled on crypto.

	Deribit	Bit.com	OKX	Delta Exchange	FTX.US Derivatives	CME
Underlying Assets	Deribit BTC Index, Deribit ETH Index	BTC，ETH，BCH	BTC,ETH Index Price	“Fair Price” of BTC, ETH, SOL, BNB, MATIC, AVAX, XRP, LINK	BTC, ETH	CME BTC Futures
Contract Type	European futures options	European options	European options	European options	European options	European futures options
Contract Face Value	1 Coin	1 Coin	1 Coin	0.001 BTC, 0.01 ETH, 1 Altcoin	0.01 Coin	5 BTC
Spread	0.0005 Coin*	0.0005 Coin*	0.0005 Coin*	0.00001 USDT~0.5 USDT, depending on the contract	1 USDT （BTC options）/0.1 USDT （ETH options）	Usually $25，minimum $5 （only Calendar Spreads）
Delivery & Settlement Method	Cash Settlement	Cash Settlement	Cash Settlement	Cash Settlement	Physical Settlement	Cash Settlement
Delivery & Settlement Time	UTC 8:00	UTC 8:00	UTC 8:00	UTC 12:00	UTC 22:00	UTC 16:00

Contract Elements of the Crypto Options (Part 2)

Source: Websites of exchanges, Note: Coin* indicates that the product is denominated and settled on crypto.

	Deribit	Bit.com	OKX	Delta Exchange	FTX.US Derivatives	CME
Duration	Daily, Weekly, Monthly, Quarterly, Yearly	Daily, Weekly, Monthly, Quarterly	Daily, Weekly, Monthly, Quarterly	Daily, Weekly, Monthly, Quarterly, Yearly	Daily, Weekly, Monthly, Quarterly, Yearly	Same as futures, determined by the expiration date of futures
Fees	0.03% of the premium per contract or 0.0003 Coin*, plus 0.015% delivery fee at the time of delivery	0.02 % (Maker)/ 0.03% (Taker), plus 0.015% delivery fee at the time of delivery	-0.01%-0.02 % (Maker)/ 0.02%-0.05% (Taker), depending on the fund scale & trading volume of users	0.05% of the premium per contract	0.15 USD per contract or 20% of the premium	Not yet available to the public

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Options Margin Mechanism

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The low portfolio margin threshold is one of the critical reasons Deribit options products are more popular.

For options investors, the Portfolio Margin (PM) mechanism is essential. Under the standard margin mechanism, margins are calculated separately when constructing portfolios, whether options, perpetual contracts, or futures. Therefore, investors are limited in the size of positions they can build, and the actual leverage available is relatively low, which ultimately affects returns.

The Portfolio Margin Mechanism addresses this issue to some extent. By viewing the entire portfolio as a risk ensemble and calculating net short/long exposure, the actual risk of a user's position can be reasonably measured, and users with a predominantly hedging strategy can obtain greater leverage. However, as an advanced service, each major exchange has specific restrictions on the opening and using the portfolio margin mechanism. The mechanism is usually subject to a minimum net position. FTX.Derivative, which takes physical delivery, is more restrictive as it requires a review of the investor's identity. Details are shown in the table on the following page.

By comparison, it is easy to see that portfolio margin support and restrictions are somewhat negatively correlated with its share and position in the market. For example, Deribit's minimum net position to opening a portfolio margin is about 10% of OKX and 5% of Bit.com. Even when factors other than portfolio margin (margin formula, theoretical maximum leverage, etc.) are taken into account, the influence of other factors remains relatively insignificant.

Therefore, portfolio margin is an essential factor in the popularity of options products. Although no specific details have been announced about each exchange's calculation of portfolio margin, it can be judged from some disclosed details that the level of risk control and liquidity of the exchanges themselves are the two influencing factors that ultimately affect the portfolio margin.

Since portfolio margin is equivalent to a disguised increase in leverage, the overall risk of the exchange will increase, requiring relatively high–risk control capabilities. Meanwhile, the portfolio margin mechanism allows a single investor to control a relatively large number of contracts. If the exchange is illiquid, a small number of investors can exert effective control over the market and pose a threat to regular trading.

The above creates a "Matthew effect": the more liquid the exchange and the more users it has, the lower the portfolio margin standards it can offer. When traders use portfolio margin extensively, other exchanges cannot provide similar service levels on that mechanism. As a result, most traders trades in one major exchange, and the remaining exchanges can only meet some investors' insurance and structured product-related needs.

Comparison of Options Margin Mechanisms (Part 1)

Source: Websites of exchanges, Note: Coin* indicates that the product is denominated and settled on crypto.

	Deribit	Bit.com	OKX	Delta Exchange	FTX.US Derivatives
Initial margin formula (standard margin only)	Buyer: No margin requirement Call seller: min 0.1 Coin* + options market price per contract, max 0.15 Coin* + options market price Put seller: the highest of call options margin and maintenance margin		Buyer margin = (ask price * contract multiplier + commission on a single order) * order size Seller margin = max (maintenance margin – ask price * contract multiplier + order fee, minimum initial margin * contract multiplier) * number of ask orders	Buyer: No margin requirement Seller: Position below the limit size: 1%–2% Position larger than limit size: initial margin + contract margin multiplier * (total position size – limit size)	Margin trading is not supported. The seller needs to provide full collateral
Margin maintenance formula (single contract, standard margin only)	Buyer: no margin requirement Call options seller: 0.075 Coin* per contract + options marker price Putseller: min 0.075 Coin per contract + options marker price, maximum 1.075*options market price			Buyer: No margin requirement Sell-side: position below the limit size: 0.5%–1%; position larger than limit size: original margin + contract margin multiplier * (total position size – limit size)	Margin trading is not supported. The seller needs to provide full collateral

Comparison of Options Margin Mechanisms (Part 2)

Source: Websites of exchanges, Note: Coin* indicates that the product is denominated and settled on crypto.

	Deribit	Bit.com	OKX	Delta Exchange	FTX.US Derivatives
Portfolio Margin Limits	Account must deposit at least 0.25BTC/7.5ETH in account. Investors must declare that they understand the concept of portfolio margin	Account must have a net balance of 5 BTC or more. investors must declare that they understand the concept of portfolio margin	Users have to deposit more than $ 100k in Unified Account and finish test to activate	Portfolio margin is not supported	Accredited institutional investors and individuals who meet the 'eligible contract participant (ECP)' requirement only
Theoretical Maximum leverage (standard margin only)	10x	10x	10x	50–100x, depending on the contract	1x

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Options Liquidity

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As of February 2022, standardized open interest in BTC and ETH options contracts once exceeded 4.5 million, with enough liquidity to support 100–110 institutions.

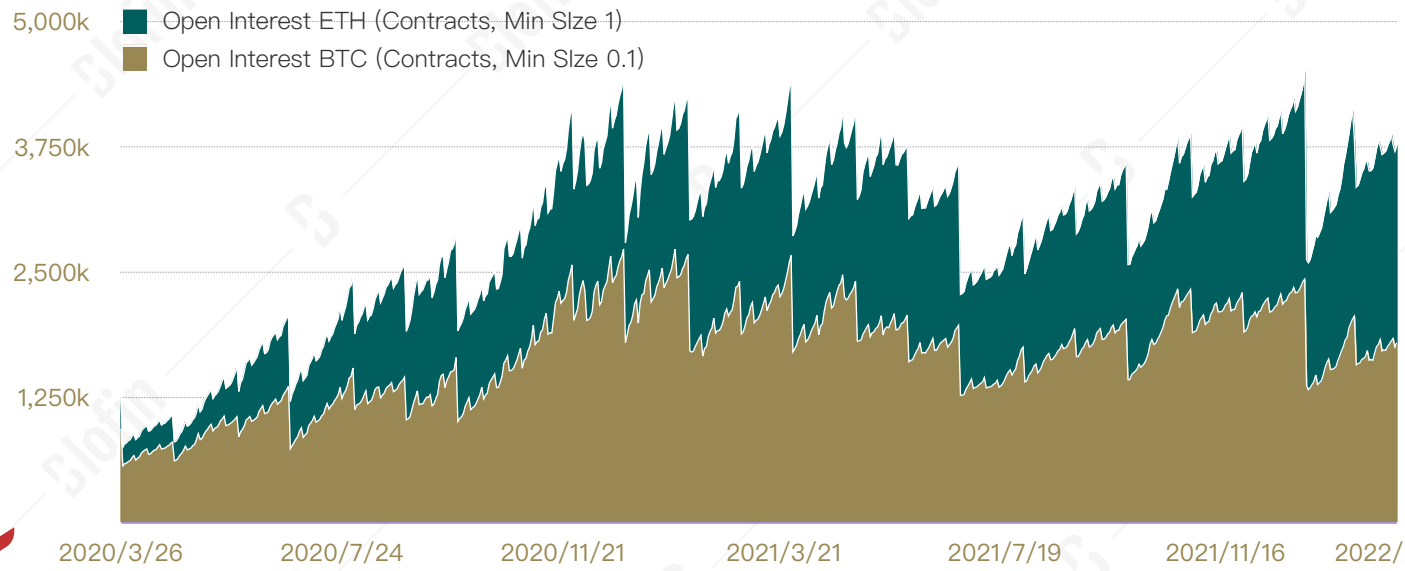
For options contracts, Open Interest (OI) is one of the instrumental indicators of liquidity levels. A larger scale of open interest means that more people are involved in trading, which can support the specific size of contracts for buying, selling, strategy building, etc., within the time frame required by investors.

The crypto options market is rapidly expanding in open interest starting in 2020H2. After standardizing the data (0.1 BTC per BTC contract and 1 ETH per ETH contract, based on the smallest trading unit), the open interest of BTC and ETH options peaked at over 4.5 million at one point in late 2021, 6.02 times of early 2020. As of February 2022, the scale of open interest has stabilized at around 3.8 million, about half of the open interest in the VIX and its related products.

Based on the standardized contract face value estimates, under the fully collateralized assumption (each contract has one corresponding underlying as margin), the available liquidity in options market can simultaneously meet the needs of 100–110 institutions allocating approximately $100 million in the options market, sufficient to support the operation of most strategies.

Open Interest Changes of BTC and ETH Options

Source : gvol.io Note: charts includes data as of 2022/2/20, and contract denominations have been normalized for statistical purposes.

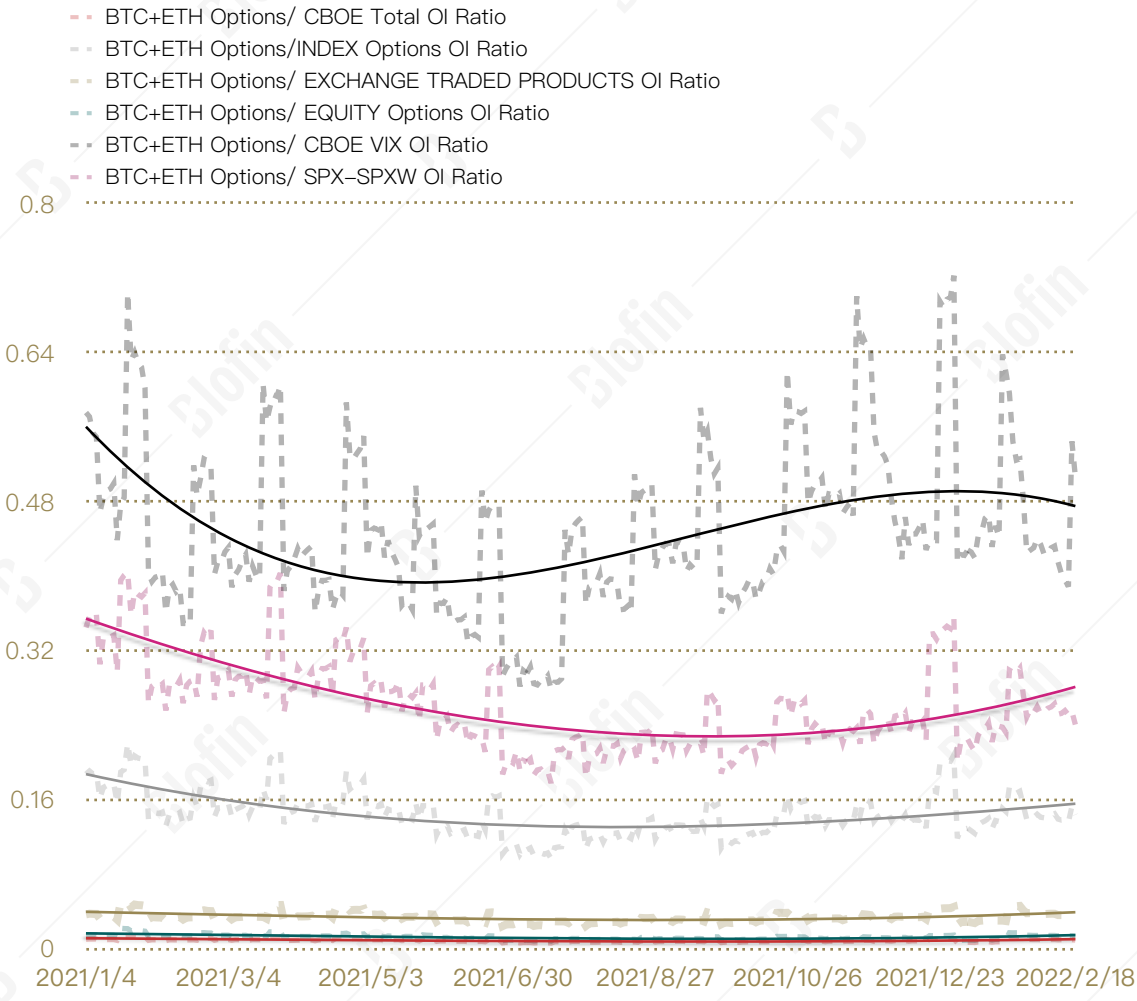


Compared to the U.S. stocks market, the overall liquidity in the crypto options market is less than 1% of the total U.S. stock options liquidity. However, crypto options are approximately 25% as liquid as S&P 500–related index options compared to individual products and about 15% as liquid as other index–based options. In addition, the open interest and daily trading volume of mainstream crypto assets are mainly comparable to the open interest and daily trading volume of the mainstream individual stock options (e.g., AAPL, FB, etc.).

In summary, for traditional institutions, the liquidity of the crypto options market can already meet their needs to diversify part of their fund for crypto–asset–related hedging and trading profits. However, the overall carrying capacity of the crypto options market is still only comparable to that of some U.S. stock products, and the number of institutions that can carry them in parallel is relatively limited.

Comparison of BTC and ETH Options Open Interest and Mainstream Options Product Open Interest

Source : gvol.io Note: charts includes data as of 2022/2/20, and contract denominations have been normalized for statistical purposes.



The OTC trading volume accounts for approximately 10–20% of the total options trading volume, with high-frequency market makers as the primary source of liquidity.

The OTC market is an essential complement to OTC trading for asset management institutions. When the fund scale of one strategy is small, the market's liquidity can still meet the demand. However, when the scale becomes large, if the order is pending at the desired price, it often takes longer to close, which means that uncertainty due to market fluctuations increases. (e.g., price movements leading to an increase/decrease in the options price resulting in part of the pending order not being filled, incomplete strategy construction, etc.)

Moreover, If the strategy is an order-taking strategy, the returns will be somewhat discounted by the intraday spread. The OTC markets allow dealers to quote individual parts of a block trading strategy or the entire strategy, which solves these problems. In addition, some OTC markets can also provide additional services such as fiat margin.

As of February 2022, about 15–20 large and medium-sized OTC service providers are active in the crypto options market. In addition to the block trading platform offered by Deribit, Paradigm is also a common platform used by OTC traders. Amber Group offers options-related OTC services on the WhaleFin platform. Institutions such as GSR, QCP Capital, Matrixport, and Babel Finance are also major crypto options OTC market members.

The share of each OTC provider in the market remains confidential, but according to Deribit data, OTC trading volume is typically about 20% of the total volume within Deribit exchange. During peak trading seasons (e.g., annual delivery), OTC trading may account for close to half of the total volume, similar to the share of block trades in the total volume within the crypto options market.

In addition to asset management institutions, Defi market-making teams (e.g., Uniswap V3 market makers) and crypto-asset miners are two active groups in the OTC market. For these groups, options are mainly used for hedging and risk hedging purposes (e.g., hedging against impermanent losses). Miners and asset management institutions also buy structured products (e.g., dual currency, shark fins) packaged by OTC service providers for investment purposes.

In addition to OTC services, GSR, Amber Group, Babel, and QCP Capital also provide market-making services for the crypto options market. According to data supplied by Deribit, as of February 2022, there are about 5–7 major options market makers, and the trading volume from market makers and institutions accounts for about 80% of the total trading volume in the crypto options market. Among them, the head market makers account for more than 10% of the options' daily trading volume.

It is worth noting that there are relatively few market makers from traditional markets. Most market makers are native to the crypto-asset industry. A possible reason is that the liquidity characteristics (7*24 hours trading, higher volatility than conventional markets) differs significantly from traditional markets.

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On-Chain Options Market

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Compared to the centralized options market, the on-chain options market development is dominated by structured products and other uses are still more limited.

The Brief History of On-chain Options

In early 2020, the earliest on-chain options projects emerged one after another. In the early stage of development, these projects mainly operated as "on-chain insurance", such as Opyn V1, Opium, Helmet, etc.

"On-chain insurance" can be understood as a forward contract with an options payoff model. The "insured" can write into the contract many possible risk events (e.g., price declines, hacking, etc.) and pay a periodic "premium" to the "underwriter", who will compensate the "insured" if the event occurs.

Many policies regard investment risk as to the insurance target. However, the coverage provided by forward contracts is relatively limited, and the pricing methods vary. Consequently, some projects started the attempt to standardize insurance contracts regarding investment risk.

Around 2020H2, on-chain options projects such as Opyn V2 and Hegic officially launched. In 2021, 50 options-related projects had emerged, including but not limited to European options, American options, exotic options, and structured products. In addition, several projects have started to make innovative explorations in options-related products, such as perpetual options, power perpetual contracts, etc.

As of February 2022, approximately 60 options projects are still in operation, with a total locked-in volume of no more than $1 billion. According to DefiLiama, only nine options-related projects have a $10 million level of TVL(the total value locked (TVL) can be considered a liquidity indicator to some extent), with options trading platforms and options capital management platforms accounting for half separately. Specific project information is shown in the table below.

Current Status of the On-Chain Options Market

Unlike centralized exchanges, currently, on-chain options products mainly consist of structured products. Investors deposit their funds into structured product smart contracts, and the project team or pre-defined smart contracts will manage these funds manually or automatically. The structured products projects represented by Ribbon Finance have managed more than $200 million, while projects such as Katana and Thetanuts also have managed more than $20 million.

List of Some Major On-chain Options Projects

Source : DefiLlama, Note: the table includes data as of 2022/2/20 and only includes projects with TVL over $50m.

	TVL	Public Chain	Project Type
Opyn V2	$248.71m	Ethereum, Avalanche	Options trading platform
Ribbon Finance	$198.03m	Ethereum, Avalanche, Solana, Aurora	Structured product
Friktion	$90.27m	Solana	Structured product
Lyra	$77.11m	Ethereum, Optimism	Options trading platform
Dopex	$58.81m	Ethereum, Avalanche, BSC, Arbitrum	Options trading platform

However, very few secondary market investors are still willing to invest in on-chain options projects. The number of project token holders can reflect the project's popularity to a certain extent. Among the on-chain options projects with a lock-up volume of more than $10 million, the number of project token holders has not exceeded 6,000, lower than other derivatives project tokens like $DYDX.

Token Holders of Some On-Chain Options Projects

Source: Source: Etherscan, Arbiscan, optimistic.etherscan.io Note: the table includes data as of 2022/3/1 and only includes projects with TVL of more than $10m. L1 is the Ethereum mainnet, and L2 is the Ethereum layer 2 network (Layer 2).

Token	No. Of Holders
RBN	3,720(L1)
PREMIA	1,630(L1)+437(L2)
DPX	1,489(L1)+3,700(L2)
JONES	1,188(L2)
LYRA	811(L1)+4,880(L2)

Although on-chain options projects can provide some contracts unsupported by centralized exchanges temporarily and also support the liberalization and customization of underlying assets to a certain extent, there are still many problems in terms of liquidity, handling fees, contract security, contract mechanism design, which needs to be solved gradually in future development.

Liquidity

In terms of liquidity, most options trading platforms on the chain can usually support mainstream cryptos' weekly and monthly contract liquidity. In contrast, they can generally only support the weekly or even daily contract liquidity for altcoin options. Meanwhile, due to the lack of sufficient market makers, the liquidity situation of on-chain contracts further deteriorates, resulting in incomplete strike prices.

As a result, buyers can only choose a few execution prices to buy contracts as "insurance" or conduct OTC-like transactions through on-chain inquiries. They cannot close their positions on time when their positions have good PnL. Sellers can also not close and hedge their positions due to the lack of liquidity.

To solve the liquidity issue, projects such as Hegic and Dopex have chosen to use AMM (Auto Market Maker) to provide sufficient liquidity. However, the user can usually only act as a buyer under the AMM model, while the liquidity provider usually serves as a seller. This means that strategies are limited: investors can only adopt buy-side strategies, while the sell-side strategies can only operate according to the set from the project owner. Some projects have improved the AMM mechanism to allow users to act as sellers (such as Lyra), but overall it is still in the exploratory stage.

Some projects (such as Zeta Markets) choose to combine the AMM mechanism with the order book to try to solve the shortcomings of AMM or provide some compensation for the seller, such as "transaction mining (by rewarding users with project tokens to motivate users to provide liquidity through frequent transactions)" and "Token insurance (providing project tokens as compensation when the seller suffers losses)".

However, the overall inadequacy of the AMM mechanism still makes professional investors choose limited participation in the on-chain trading from the perspective of liquidity risk and strategy execution. Furthermore, the lack of professional investors and institutions perpetuates the illiquidity problem. At the same time, some project token speculators will only provide liquidity during the mining event, which makes the liquidity drop significantly after the event and brings additional risk.

On-Chain Handling Fees

On-chain handling fees are also significant constraints on on-chain options trading. As of February 2022, more than 60% of all options projects operate on Ethereum. The average transaction fee for completing the whole trading process on Ethereum has generally reached about $20, which is comparable to the premium of a weekly even monthly options contract with a low strike probability (delta < ±0.1).

Given the current level of liquidity, there is a mismatch between the amount of net premium an individual investor can receive for selling options and the risk they need to take. For block trades, the fees can be spread over each contract to reduce costs, making investors inclined to aggregate their capital first and then invest, ultimately prompting them to put liquidity into structured products.

Smart Contract Security

Although mainstream projects have audit reports provided by third-party auditors (OpenZeppelin, CertiK, Quantstamp, etc.) regarding contract security, they still lack real-world compliance elements. For investors, the security risk of smart contracts is still relatively high compared with centralized exchanges.

The above has led institutional investors to remain somewhat cautious about trading options on chain. In contrast, individual investors tend to choose third-party teams to manage their funds, further driving the development of structured products on chain.

Margin Mechanism Design

In terms of options margin mechanism, on-chain options contracts are biased towards the buyer to a certain extent and are not conducive to the seller.

To ensure that contracts operate on a trustless basis, options sellers often need to provide full or even over-collaterals as a margin. In this case, the capital utilization efficiency of options sellers is lower than that of centralized exchanges.

Although some trading platforms (such as Opyn V2) try to introduce a margin mechanism, compared with the higher risk of no trust in centralized exchanges, on-chain options sellers need to pay a higher percentage of margin. For example, the margin mechanism proposed by Opyn V2 requires users to provide at least a 33.3% margin for each options contract. In contrast, the margin level usually does not exceed 20% for each options contract traded on centralized exchanges. For options sellers, a high margin means low yield.

In addition, on-chain options contracts currently do not support complex trading mechanisms such as portfolio margin and dynamic hedging. The lack of portfolio margin will lead to limited strategies for options traders. The inability to dynamically hedge means that risk control methods are finite, which is not friendly to options sellers.

Options Element Design

In addition to European options, on-chain options projects have also developed various options products such as American options, binary options, barrier options, everlasting options, and simplified products based on these options products, with different pricing formulas.

These products provide a new solution to the risk hedging needs of encrypted assets to a certain extent. Still, due to different pricing and product elements, the already-stretched liquidity in the on-chain options market is further dispersed, and the difficulty of hedging is further increased. As a result, the executable strategy of the options market on the chain is limited, and it has become an "insurance market" in disguise.

In addition, it is difficult for investors to understand the profit model of complex options products, while some relatively high-risk but straightforward products (such as binary options) strengthen the speculative nature of options and are somewhat unattractive to most investors. European options and derivative options products based on European options pricing methods are still mainstream.

It is worth noting that from 2022, options-like products (such as power perpetual contracts) will be active in the on-chain options market. Because options-like products have some options payoff attributes but are easier to understand and deploy, such products have considerable development potential.

List of Some Major On-chain Options Projects

Source : TokenInsight, Note: the table includes data as of 2022/2/20.

Types	Represented Projects
European options	Opyn V2, Siren V2, Dopex, Lyra, Oddz, Pods Finance, Zeta Markets
American options	Hegic, Auctus, Psyoptions
Binary options	Thales, Divergence, Zeta Markets
Everlasting options	Deri Protocol, ShieldEx
Options-like products	Squeeth, Power Perpetuals

To sum up, for the buyer, on-chain options provide a trustless means of hedging the risk of asset price changes. However, for the seller, due to the limitations of handling fees, security, and mechanisms, on-chain options cannot allow them to obtain stable time income through trading. Consequently, the seller's enthusiasm for trading on the chain is not high, prompting the seller to sell together, making the on-chain options market evolve into an OTC-like market for structured products with an insurance-like trading form.

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The Future of Crypto Options Market

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Ultimate Crypto Financial Services

Affected by the macro environment, the growth of crypto options trading volume may slow down, but the expansion rate of the options market may still be faster than other markets.

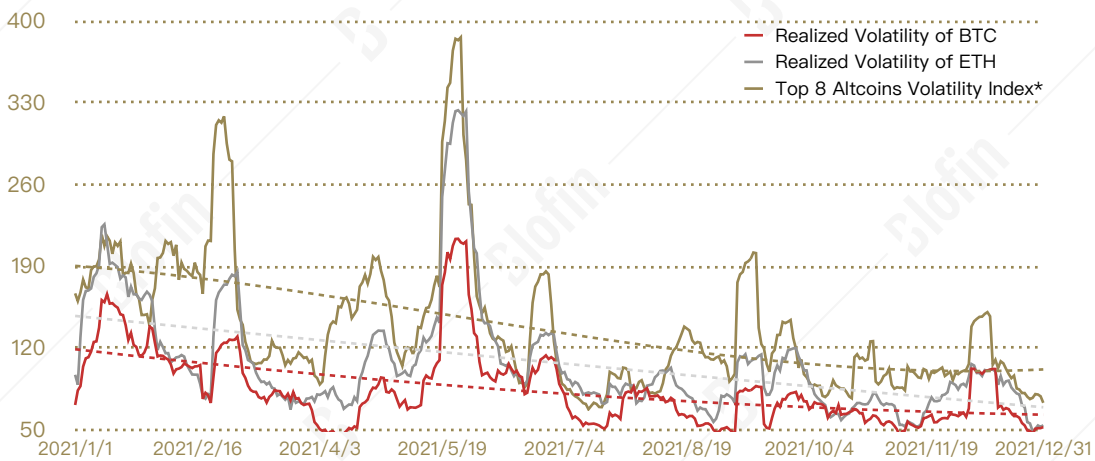
With the further development of the crypto market, more underlying will be in 2022 to meet the minimum demand for liquidity in options contracts. As of February 2022, in addition to BTC and ETH options, some exchanges (such as Delta.Exchange) have listed BNB, XRP, SOL, LINK, AVAX, and MATIC options. Deribit will also list SOL options this year.

It is not difficult to find that each underlying altcoins that can support the liquidity of options have a market cap of more than $10 billion. Their overall realized volatility has gradually converted to an acceptable level since mid-2021. Although the current liquidity of these new underlying is average and can usually only meet the trading needs of monthly options, with the follow-up of major exchanges such as Deribit, institutions and individual investors may gradually include altcoin options in the options portfolio. Moreover, the liquidity shortage of new altcoin options provides more opportunities for potential market makers.

Affected by the liquidity contraction cycle, the crypto market may shrink to a certain extent in 2022, which will affect the performance of the options market. However, due to the poor performance of the spot during the bear market, investors often consider looking for high-yield products from the derivatives market, which will push up the related demand for derivatives-related wealth management and risk control and provide more opportunities for the crypto options market.

The Realized Volatility Changes of Some Underlying Cryptos in 2021

Source: gvol.io, *Notes: the crypto market cap data on Coinmarketcap is regarded as the screening criteria for the top 8 altcoins. This chart uses the market cap as a volatility-weighted indicator to calculate the altcoins volatility index. The top 8 altcoins are BNB, SOL, ADA, XRP, LUNA, DOT, LTC, and LINK.



Structured products may become the mainstream choice for investors, and options-like products may replace exotic options products.

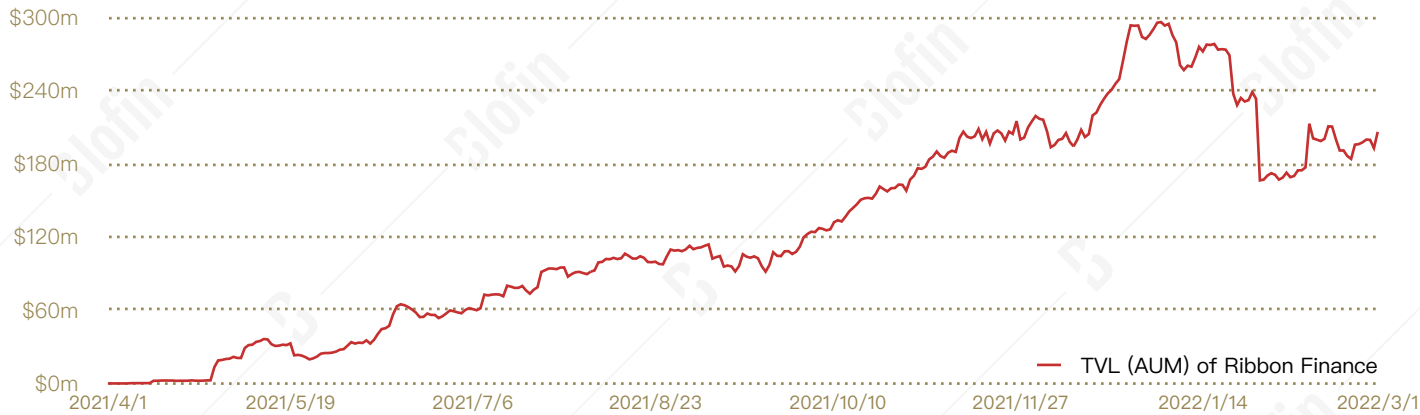
Investors have shown a significant preference for structured products, whether it is the on-chain market or the centralized options market. The reason is that, compared with complex options formulas, the mechanism of structured products is more accessible for investors to understand, and the returns are usually higher than other products.

Currently, dual-currency wealth management (Covered Call/Put Selling) products have gained high popularity both on-chain and off-chain. Among OTC service providers, dual-currency wealth management is one of Matrixport's flagship products. Among on-chain options projects, Ribbon Finance launched Covered Call/Put Selling related products in April 2021, and its asset management scale once reached nearly $300 million.

At the same time, volatility arbitrage products have gradually attracted market attention. Opyn's Squeeth Crab has also raised more than $2.4 million in a short time after launching in January 2022. Affected by the preferences of investors on and off the chain, the structured product market still has considerable potential space.

Changes in Ribbon Finance's Asset Management Scale

Source : DefiLlama, Note: the charf includes data as of 2022/3/1.



It is worth noting that the overall performance of exotic options products in 2021-2022 is relatively weak. Whether the product comes from Binance or an on-chain project, the liquidity available for a single product is usually no more than $1 million. In contrast, options-like products (such as Squeeth) with some options income attributes and lower user thresholds have gained a high degree of attention on the chain and earned more liquidity quickly. Therefore, options-like products may become one of the directions of on-chain and even centralized exchanges.

Over-the-counter options trading methods and underlying may be further expanded, and user trading thresholds may also be lowered.

From November 2021, on-chain structured product providers began to provide customized over-the-counter options contracts for altcoins with a lower market capitalization (for example, AAVE) and reached cooperation with institutions such as QCP Capital to trade options. Investors in structured products become sellers, and institutions are buyers, forming a de facto OTC transaction.

Although the scale of similar transactions is still relatively limited, this means a new revolution for the crypto options market. On-chain structured product service providers have evolved through customized smart contracts into on-chain OTC service providers.

Based on the existing structured products and services, on-chain OTC service providers can customize options and other derivative contracts for relevant project parties in the blockchain industry to provide more liquidity for the project party's tokens. On the other hand, on-chain OTC providers can also cooperate with institutions to give the institutions options that are not currently provided by centralized exchanges and conduct options OTC transactions on chain to meet the hedging needs of institutions. At the same time, it also brings profit to structured product investors.

It is not difficult to predict that in 2022, on-chain OTC services may enter a period of expansion. Together with the existing OTC markets, the on-chain OTC service will meet the various needs of market participants for risk hedging and liquidity optimization.

In addition, options contracts with USDC as margin have also been gradually put on the schedule of major options exchanges such as Deribit. Compared with the relatively high user threshold for coin-margined contracts, the USDC standard options contract will have more intuitive profit and loss, pricing, and settlement methods, which will also help eliminate the exchange rate risk in depositing, withdrawing, and trading. Therefore, whether it is for individual or institutional investors, the USDC-margined options will be attractive enough. We believe that USDC-margined options will push the options market to a new height in 2022.

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