Navigating
DeFi Derivatives

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Key Takeaways

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- With DeFi forecasted to gross US$231.2B in revenue by 2030, decentralized derivatives are poised to become a significant and fundamentally important part of DeFi's future, playing a crucial role in its growth and development.

- Crypto-native perpetual futures overwhelmingly dominate the market, contributing over 90% to DeFi derivatives TVL. Meanwhile, despite being relatively nascent, the options sector possesses substantial growth potential, as highlighted by the recent emergence of innovative protocols.

- dYdX and GMX remain household names in the perpetual futures landscape, collectively capturing an impressive 64.9% of the trading volume. The forthcoming releases of dYdX V4 and GMX V2 signify key milestones for both protocols this year.

- This year also marked a notable shift in the perpetuals market, with emerging protocols such as Kwenta, MUX, and Level Finance gaining traction. Each showcases remarkable growth, especially Kwenta, which captured 11.6% of market share.

- In the options market, Lyra stands out with over US$580M in YTD trading activity, while Dopex and Opyn maintain a notable presence. Ribbon Finance's Aevo has gained traction, representing an interesting development in the space.

- A key distinction among competing protocols lies in their underlying models, such as CLOB- or AMM-based. The emergence of concentrated liquidity pools is paving the way for a new generation of protocols in the options market.

- Layer-2s have emerged as the networks of choice for DeFi derivatives. Arbitrum has grown to top the charts by hosting 42 derivatives protocols, while Optimism and zkSync also demonstrate promising growth.

- To compete effectively, decentralized derivatives must prioritize continuous innovation in infrastructure and UI/UX design for more familiar trading experiences.

2 **Introduction**

The last few years have seen the crypto industry expand its hold on global markets, largely driven by an increasing number of real-world use cases originating from decentralized applications ("dApps"). In particular, the inception of decentralized finance ("DeFi") has been a key contributor to user adoption, having reached a total value locked ("TVL") of US$41.6B[1]. The market, for the most part, is continuing to mature, and while still in its infancy, DeFi is forecasted to gross US$231.2B in revenue in 2030[2]. **One important sign of this maturing market has been the evolution of crypto derivatives, which are poised to become a significant part of DeFi as it grows toward its expected target.**

Derivatives are known to be one of the largest markets in the traditional finance ("TradFi") world, and the crypto industry has followed suit, with trading volumes across centralized exchanges ("CEXes") being dominated by derivative products. While the growth of derivatives in CEXes is unparalleled, it does leave a fairly large addressable market for DeFi to tap into. **The magnitude of trading volume seen in CEXes is indicative of the potential for derivative-based dApps that can achieve product-market fit.** Traditionally, developing derivative products in a decentralized framework has been challenging, causing decentralized exchanges ("DEXes") to lag behind their CEX counterparts. Today, this narrative is starting to be refuted after the emergence of several innovative protocols, each built on markedly unique models and in a race to capture market share.

What's more, the adoption of derivatives has been on a remarkably upward trajectory despite having entered a crypto bear market, a trend that is likely driven by the fundamental need for more sophisticated trading strategies within DeFi. **Considering the importance of derivatives for efficient market participation, these types of instruments are extremely important if DeFi is to take the next step in its lifecycle**.

In this report, we explore the growing decentralized derivatives landscape, including the state of on-chain protocols and the different types of derivatives products offered. We also analyze the current market outlook, recent developments, opportunities, risks, and what we believe the future holds for one of the most promising and fundamentally important areas of DeFi.

3 **Background**

What Are Crypto Derivatives?

Crypto derivatives are financial instruments whose value depends on underlying assets, much like traditional derivatives. In TradFi, common underlying assets include stocks, bonds, commodities, currencies, interest rates, and market indexes. For crypto derivatives, the underlying assets are primarily cryptocurrencies such as Bitcoin or Ethereum.

So what are the different types of crypto derivatives? For the purpose of this report and ease of understanding, we will classify the crypto derivatives space into two distinct segments. **Perpetual futures and options contracts are among the most commonly traded derivatives in DeFi**.

It is important to note that derivatives can also be classified through other investment vehicles like swaps, synthetic assets, or structured products. Swaps involve exchanging cash flows or liabilities on two separate financial instruments, with interest rate swaps being a common example. Synthetic assets are tokens that are digital representations of derivatives, while structured products consist of multiple asset classes, of which one is a derivative.

Perpetual futures

Perpetuals are a type of futures contract, which are agreements to buy or sell cryptocurrencies at a predetermined price and specified time in the future. **There is, however, one main difference between futures and perpetuals: contrary to traditional futures, perpetuals do not have an expiration date**, allowing them to be held indefinitely without rolling over contracts near expiration. **Perpetuals are considered essential building blocks in DeFi and the most widely traded crypto derivative.**

A key component of perpetuals is the perpetual funding rate, which plays an important role in maintaining price stability by aligning the contract price with the spot price of the underlying asset. They work by incentivizing traders to buy perpetual contracts when the price is low and sell when the price is high relative to the index. Generally, two main components are involved in funding rate calculations: An **interest rate** and a **premium component**. The interest rate is typically constant and will depend on the underlying assets. The premium component is used to quantify the deviation between the perpetual price and the market price. The total funding rate is the sum of these two components.

Fun fact: Perpetual futures were first proposed by Nobel Prize winner Robert J. Shiller in 1992 to enable derivatives markets for illiquid assets, though they didn't gain the same level of traction in TradFi[3]

Options

Options are derivative contracts that provide the opportunity to buy or sell an underlying asset at a predetermined price on or before the expiration date, after purchasing a premium. **Unlike futures, the holder is not obligated to buy or sell the asset if they choose not to.** The premium represents the payment made to acquire the rights granted by the contract. Its cost depends on factors such as the time remaining until the contract's expiration, the volatility of the underlying asset, the market price of the asset, and prevailing interest rates.

In particular, there are two types of options. Call options permit the holder to buy the asset at a stated price within a specific timeframe. In contrast, put options allow the holder to sell the asset at a stated price within a specific timeframe. Each call option has a bullish buyer and a bearish seller, whereas put options have a bearish buyer and a bullish seller.

◆ **Call option contract:** the right to buy

◆ **Put option contract:** the right to sell

The inherent volatility in crypto markets makes options a popular choice among investors. They utilize options to hedge and reduce the risk exposure of their portfolios. As options do not entail any obligation to buy or sell, they are considered a risk-reducing trade. **Currently, the most popular crypto options are based on Bitcoin and Ethereum.**

Growth of Crypto Derivatives

It would be an understatement to say that crypto markets on CEXes are dominated by derivatives. **Crypto derivatives currently constitute 74.2% of the market share in trading volume**[4]**. In fact, the two most widely traded crypto assets, Bitcoin and Ethereum, have a spot-to-futures volume ratio of 0.23 and 0.13**[5]**.** The futures market today has a monthly trading volume of US$1.6T, which is nearly 3x growth since 2020; at its peak in 2021, this figure was closer to US$7.5T. In comparison, the options market is relatively newer and currently trades at around US$32.0B[6] in monthly volumes.

Figure 1: Monthly futures volume has trended upward, attaining nearly 3x growth since 2020
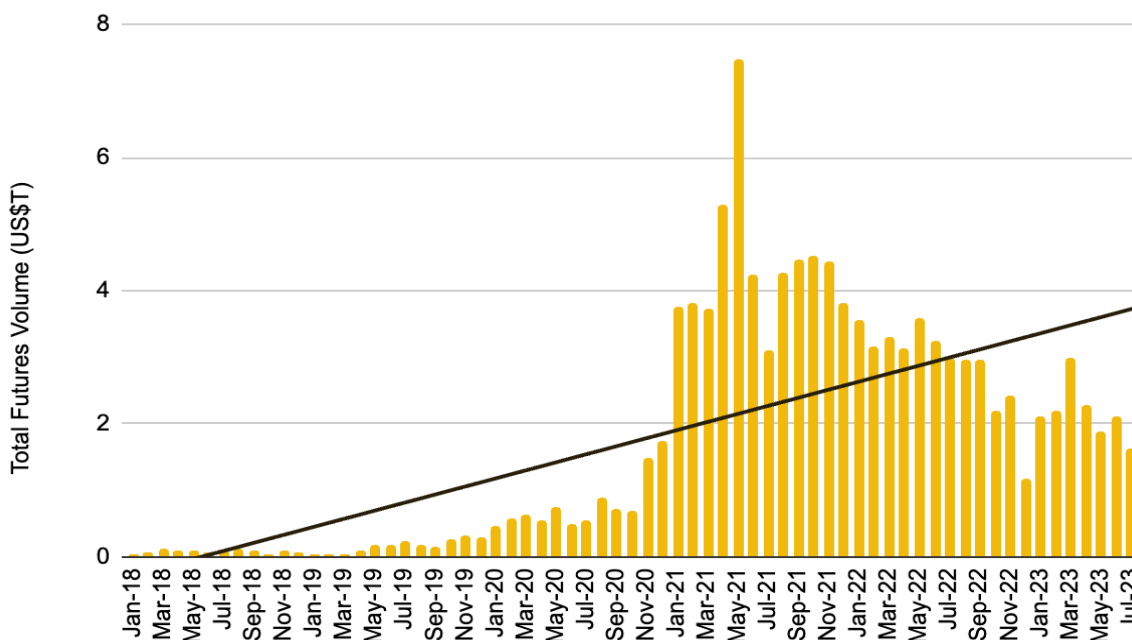
Such metrics signify the importance of derivatives in crypto markets, and this trend shows no sign of stopping any time soon. But how much of the derivatives volume is contributed by DeFi? With a futures trade volume ratio at 1.4%, Figure 2 infers that decentralized protocols are yet to attract the large derivatives market seen in CEXes.

Figure 2: Derivatives trading on DEXes is yet to take off in comparison to their centralized counterparts, with DEX-to-CEX futures trade volume at 1.4%
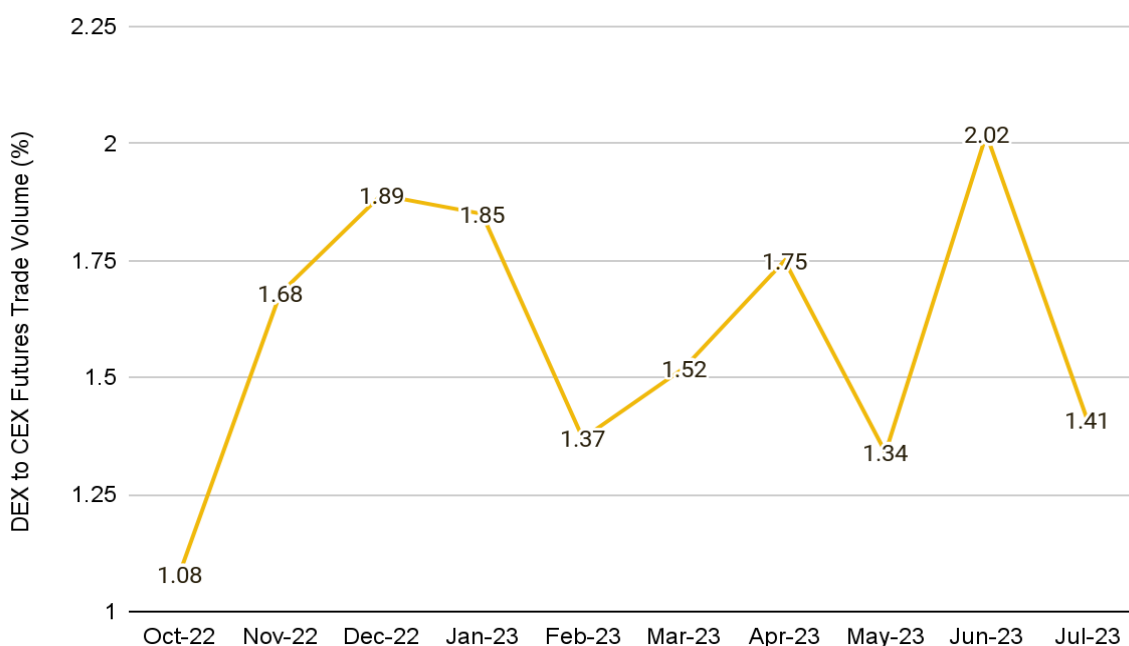
CEXes had a favorable advantage due to their first-mover advantage, having productized crypto derivatives as early as 2012. Put in perspective, that is more than 10 years to fine-tune a product compared to the relatively nascent DeFi ecosystem. Yet, if you analyze decentralized markets in absolute terms, derivatives trading volume has significantly grown since early 2021[7]. **Add to this the increasing development activity for derivatives-based protocols, and it is evident that there is a strong appetite for such products, though adoption is only likely to accelerate once markets have had the time to develop organically.**

This pattern is further supported by the typical progression of cryptocurrency adoption, usually commencing on CEXes before shifting to DEXes. **Considering the sheer volume of derivatives activity on traditional markets and CEXes, it's reasonable to predict significant potential for decentralized protocols to capture more of the total crypto derivatives market share**. While derivatives usually outperform spot trades in volume, this trend has yet to fully materialize in DeFi markets.

In fact, taking a closer look at the analogous decentralized spot markets, the DEX-to-CEX spot trade volume ratio has grown from 0.23% to 16.9% in just over three years. Having had more time to mature, spot trading dApps were able to thrive and achieve product-market fit. This reference may validate the above hypothesis if such trends were to also hold true for decentralized derivatives, though additional variables should also be factored in. **Even so, the growing adoption of spot trading DEXes is itself complementary and likely to contribute to the demand for other decentralized products**.

Figure 3: Spot trading on DEXes has seen impressive traction, reaching a record 22.0% in DEX-to-CEX spot trade volume in May
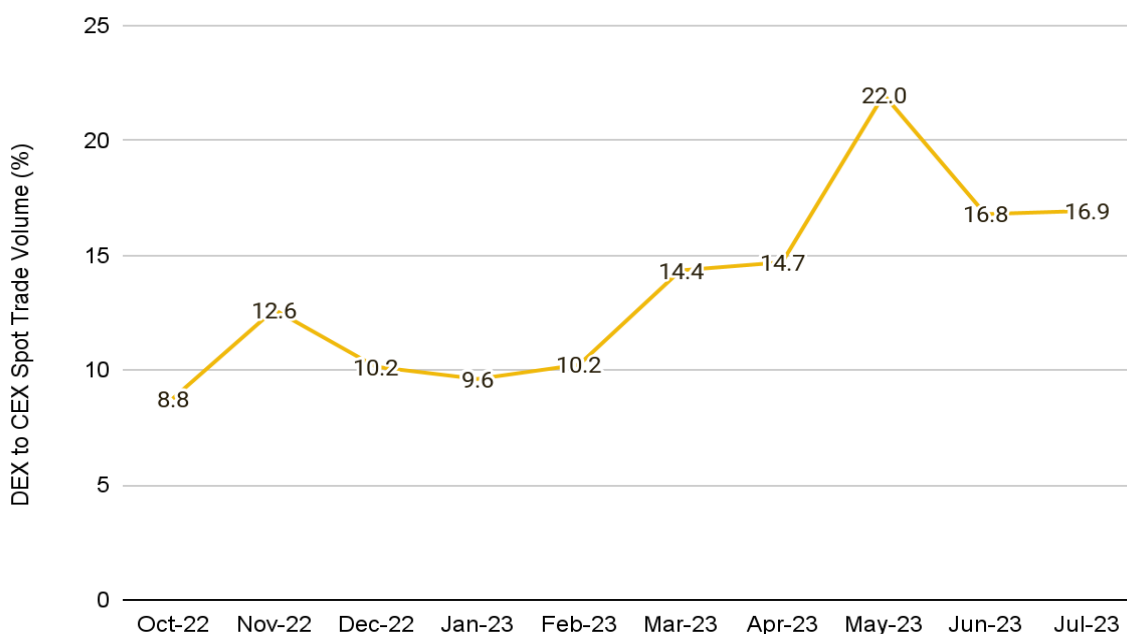
Source: The Block, Binance Research, as of July 31, 2023

Though the shift from CEX to DEX will take some time, perpetual futures and options protocols are starting to boast high daily volumes. The advent of Layer-2s ("L2s") has also nullified performance-based issues previously faced by DEXes, with attention shifting toward the models that underpin decentralized derivatives. Amid recent challenges overshadowing certain CEXes and ongoing innovations in DeFi products, more users are gravitating toward decentralized means of trading. This shift, while primarily affecting the spot market, also sets the stage for new opportunities in derivatives moving forward.

Of course, this argument is void without realizing the underlying benefits of decentralized entities compared to their centralized counterparts. There are a few notable distinctions between CEXes and DEXes, typically revolving around control, custody, design, regulations, liquidity, and accessibility. For more detailed comparisons of CEXs and DEXs, check out our report, Centralized and Decentralized Exchanges - What's the difference?

Composition of Decentralized Markets

Despite being nascent, with derivatives-based products only contributing around 3.7% to total DeFi TVL[8], the decentralized derivatives market has rapidly gained traction. The derivatives landscape is quite substantial and entails numerous interesting projects across a wide range of spectrums. Figure 4 below is a representation of just how broad the landscape is. Though perpetual futures and options-based products boast the largest number of protocols, innovations have spread to other verticals as well, including fixed yield, interest rate swaps, and structured products.

Figure 4: Decentralized derivatives market landscape across key sector verticals
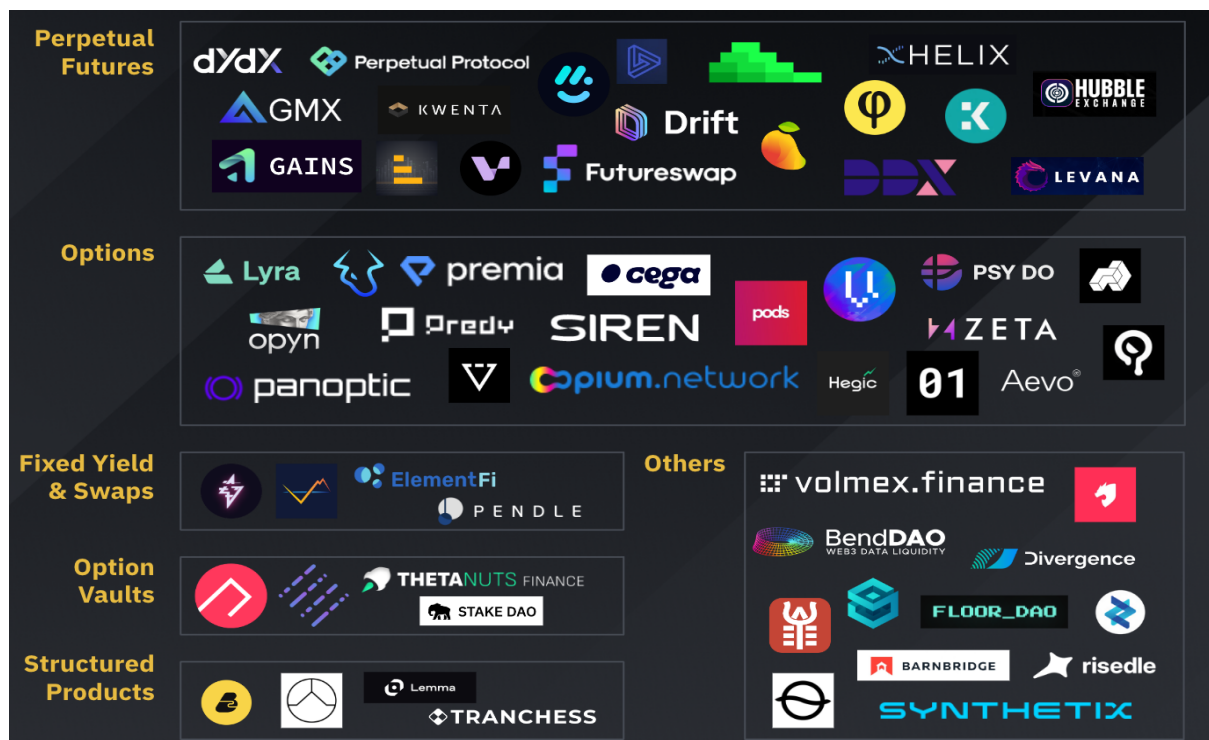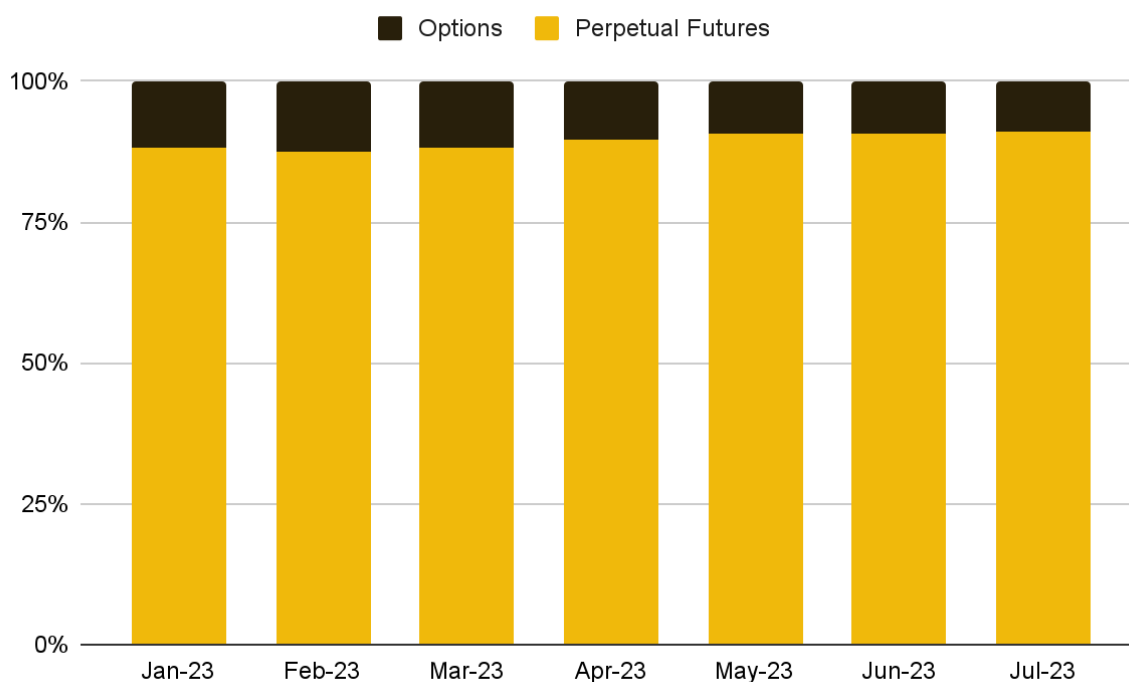

Source: 0xperp, Binance Research

The complex nature of derivatives means that protocols tend to vary in how products such as perpetual futures or options are modeled. **Newer protocols continue to emerge, including those that mirror the growth and custom needs of the digital asset market**. This certainly drives competitive pressures and explains why, in today's landscape, we see several protocols coexist in a similar vertical. Yet, as protocols continue vying for market share, we expect the derivatives landscape to continue its consolidation in the long term.

Today's market is unequivocally dominated by crypto-native perpetual futures, which contribute over 90% to DeFi derivatives TVL. Their popularity in decentralized markets isn't surprising, given their dominance in CEXs. Perpetual futures are also notoriously easier to model within a decentralized framework than other derivatives, such as options. **Options are a comparatively smaller segment of the DeFi market, likely due to its relatively younger lifespan, though there is certainly the capacity for more growth in this vertical**. Naturally, we have seen DeFi markets prioritize perpetuals, though other products are also starting to emerge.

Figure 5: Perpetual futures dominate DeFi's derivatives economy, accounting for over 90% of TVL
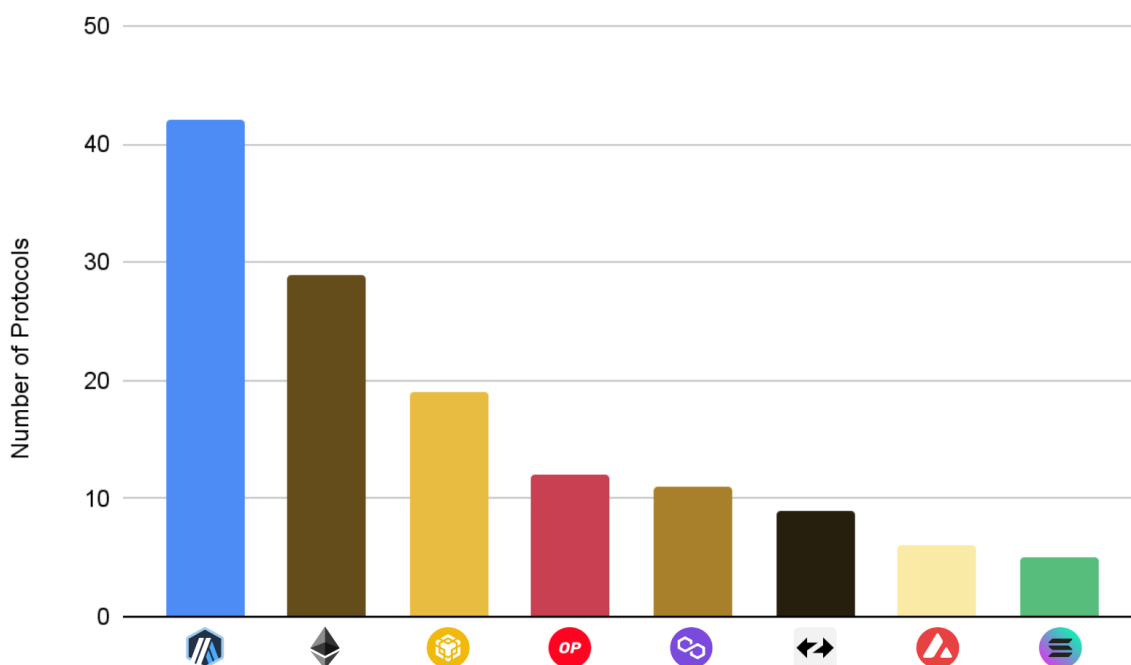

Source: DefiLlama, Binance Research, as of July 31 2023

Regarding blockchains, L2s have emerged as the networks of choice for derivatives protocols. In fact, Arbitrum currently tops the charts by hosting 42 protocols, while Optimism and zkSync also demonstrate promising growth. **Notably, top-tier derivatives protocols initially created on L1s are now contemplating their expansion into L2s**. A case in point is Level Finance, which, despite originating on the BNB Chain, recently debuted on Arbitrum. **This trend of deploying on L2s will likely persist among both new and established protocols**.

Indeed, L2s offer several attractive benefits, including rapid transaction processing, minimal gas fees, and high security. The need for speedy transactions becomes particularly significant for protocols offering leveraged trading, as it ensures the execution of prices aligns closely with the trader's expectations. Additionally, lower gas fees ease the expense burden for derivatives protocols when they retrieve asset prices from oracle services such as Chainlink or Pyth Network.

Figure 6: L2s are gaining increasing traction as the platform of choice for derivatives protocols, with Arbitrum noticeably in the lead, hosting 42 such protocols

Please note: Only derivatives and options protocols have been considered, and with a minimum TVL of US$100K.

Source: DefiLlama, Token Terminal, Binance Research, as of July 31, 2023

4 Perpetual Futures

We will start by diving deeper into the most popular derivatives product in crypto markets today. As with any other high-demand product, competing forces are always likely to coexist in the market, and this is certainly the case for perpetual futures. **What makes each player in this space distinct is that each protocol has built its own design for modeling perpetual contracts**. This becomes an important consideration when analyzing the decentralized perpetuals ecosystem.

- **Central limit order book ("CLOB"):** CLOBs stand as one of the earliest methods utilized by decentralized perpetual futures protocols, drawing upon the mechanics of their centralized counterparts. The model aggregates orders and pairs buyers and sellers in an off-chain environment. **While trades and liquidations are reconciled within the network, the management of the order book and the process of matching orders have primarily occurred off-chain.** However, efforts are underway to facilitate efficient on-chain order books. dYdX has championed this model, establishing itself as the current leading perpetual futures protocol in terms of trading volume.

- **Liquidity Pools:** These models rely on liquidity pools, with one notable distinction being whether price discovery occurs internally or externally via oracles.

  - **Virtual automated market maker ("vAMM"):** vAMMs employ a similar constant product formula as traditional automated market makers ("AMMs") like Uniswap. **In this model, assets aren't actually stored within the vAMM. Rather, they are secured within a smart contract vault, which subsequently functions as the collateral backing the vAMM**. Perpetual Protocol was the first to pioneer the use of such a framework.

  - **Oracle-based: First popularized by GMX, this oracle-based approach centers around liquidity providers ("LPs") engaging directly with traders as counterparties**. In this system, the allocation of profits and losses hinges on the outcome of the trades. **When traders generate profits, the liquidity pool collectively absorbs the associated losses. Conversely, when traders suffer losses, the accrued gains are distributed across the liquidity pool**. A distinctive feature of this system is the role of LP tokens, which see their value rise as the pool recovers losses from traders. This model has gained more traction over time and is being adopted by several emerging protocols.

While dYdX and GMX persist as household names, holding over 64.9% of trading volume market share, several innovative players have begun to emerge. In particular, Kwenta, MUX, and Level Finance have gained considerable traction this year, each recording impressive growth and collectively capturing 19.8% of market share. Additionally, Perpetual Protocol, one of the earliest derivatives-based protocols, continues to pioneer its unique vAMM model. Simultaneously, Gains Network maintains a prominent position, carrying the third largest market value, despite recently falling behind its competitors in terms of trading volume and TVL.

Figure 7: Comparative snapshot highlighting key details and metrics of perpetual futures protocols

	dYdX	GMX	Gains Network	Kwenta	MUX	Level Finance	Perpetual Protocol
Protocol Details							
Launch	Apr 2020	Sept 2021	Apr 2021	Jul 2021	Aug 2022	Dec 2022	Dec 2020
Model	**Order Book** powered by an off-chain matching engine	**Oracle-based** liquidity supplied by GLP holders	**Oracle-based** liquidity supplied by gDAI vault	**Oracle-based** liquidity supplied by Synthetix debt pools	**Oracle-based** liquidity supplied by MUXLP holders	**Oracle-based** powered by three low-high-risk tranches	**vAMM** with trades processed through Uniswap V3
Blockchain	Ethereum (StarkEx), dYdX Chain*	Arbitrum, Avalanche	Arbitrum, Polygon	Optimism	Arbitrum, BNB Chain, Optimism, Avalanche, Fantom	BNB Chain, Arbitrum	Optimism
Token	DYDX	GMX, GLP	GNS, gDAI	KWENTA	MCB, MUX, MUXLP	LGO, LVL	PERP
Key Metrics							
30D Trading Volume (US$B)	22.1	2.8	2.3	4.5	1.2	1.9	0.6
TVL (US$M)	345.4	576.0	50.3	-	60.1	25.0	18.1
Market Cap (US$M)	350.4	497.7	139.0	22.9	43.1	16.6	34.7
Daily Users	85	771	304	448	186	49	235
Daily Fees (US$K)	129.1	144.7	45.5	54.5	23.5	35.7	13.0

*dYdX Chain is built using the Cosmos SDK and is part of the upcoming dYdX V4 release.

Source: Project teams, Token Terminal, DeFiLlama, CoinMarketCap, Binance Research, as of July 31, 2023

We will now examine each protocol individually, which will help us understand their specific features and shed further light on the various models in today's perpetuals ecosystem. It is important to note that besides the distinctions in models, there is certainly more than one criterion for protocol design. **Composability, liquidity, token incentives, trading fees, and UI/UX design, for example, are often deemed additional differentiating factors by users in this sector.**

dYdX

With daily trading volumes averaging just over US$1B this year, dYdX stands as the largest player in the decentralized perpetuals space. **Similar to CEXes, dYdX is based on an order book mechanism, which has been a significant part of the protocol's success.** In particular, dYdX employs a hybrid model, combining non-custodial on-chain settlement and an off-chain low-latency matching engine with order books[9]. Order books, as the term suggests, compile all buy and sell orders for each type of crypto asset off-chain. The mechanism initiates trades when buyers' and sellers' prices align, settling the final transaction on-chain.

dYdX deems the order book to be a critical part of its platform given its recognizability with CEXes and ability to provide institutional-grade, familiar trading experiences for individuals and traditional market makers. The protocol provides market makers with flexibility and offers traders more precise control over the prices at which they buy and sell. This model allows dYdX to expand its offerings of order types, including trailing stop and bracket orders, further contributing to an extensive range of trading pairs and increasing the protocol's market depth. Alongside dYdX's critical first-mover advantage, these features have enabled it to attract institutional traders and command the highest daily trading volumes, outpacing its rivals by over fivefold.

Figure 8: dYdX dominates daily trading volumes, averaging over US$1B in 2023, significantly ahead of the second-largest protocol, GMX
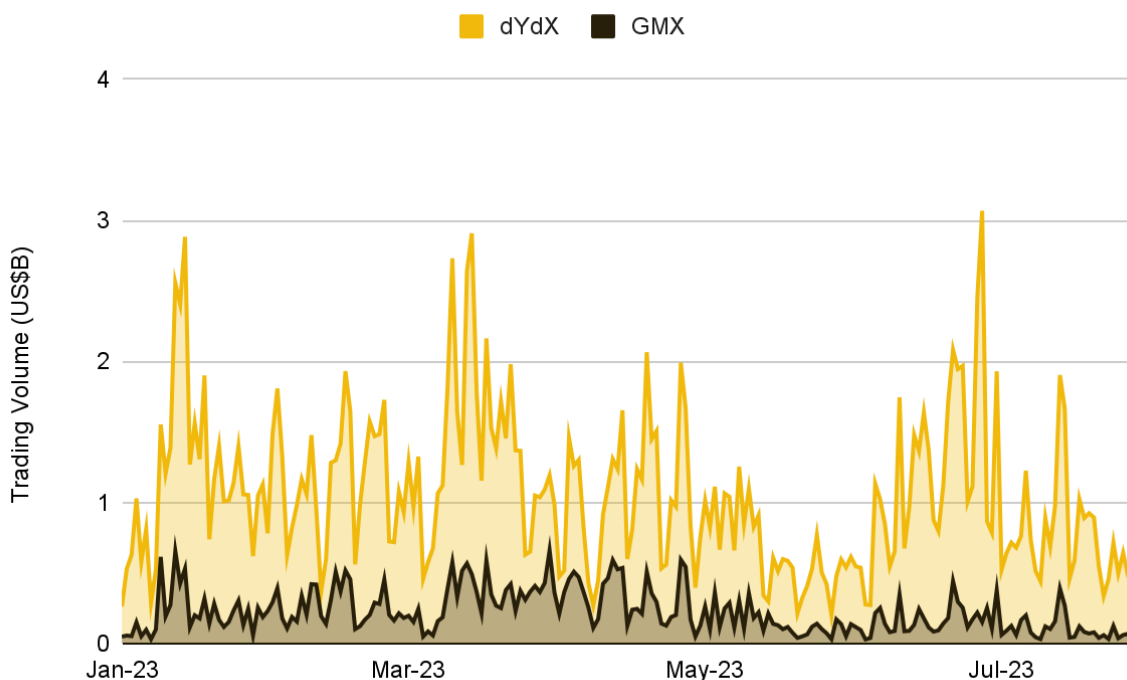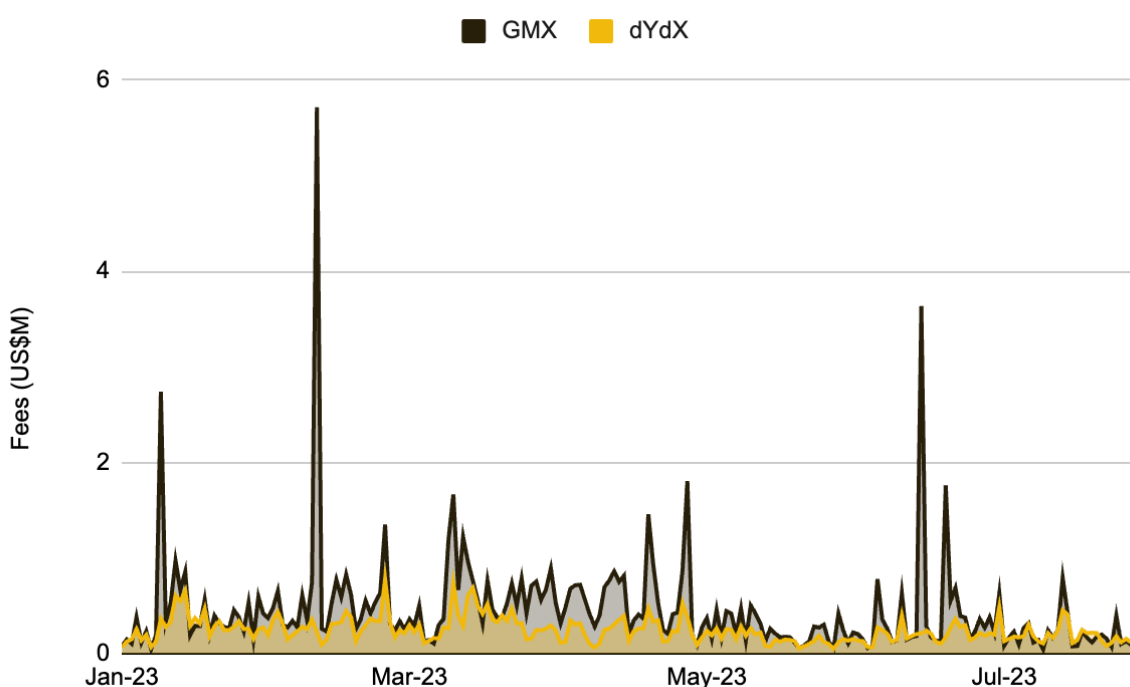

Source: Token Terminal, Binance Research, as of July 29, 2023

In fact, throughout this year, dYdX has consistently demonstrated impressive monthly volumes, even surpassing some leading CEXes like Derbit and Kraken[10]. However,

dYdX's volume is notably boosted by its token incentives and inherent fee structure, resulting in lower fees compared to its close competitor, GMX. GMX applies a flat trading fee of 10 bps based on the notional trading volume[11], while dYdX adopts a volume-tiered fee structure, offering fee exemptions for traders with less than US$100K in 30-day notional volume and a maximum fee rate of 5 bps[12]. **As a result, dYdX has often invested more in incentives than it generates in fees, though recent changes, including a 45% reduction in trading incentives, indicate a strategic shift towards profitability**[13]. It will be interesting to monitor dYdX's volumes, fees, and rewards moving forward.

Figure 9: Despite boasting high trading volumes, dYdX still generates less fees than GMX

Source: Token Terminal, Binance Research, as of July 29, 2023

dYdX employs its own API for market makers to engage with the platform's order book, covering trading spreads for a nominal fee. This enables the protocol to harness deep liquidity and provide low slippage for its traders. **Generally, protocols with the highest liquidity are more attractive as they promote efficient market conditions and effective price discovery, which are important components of derivative markets**. Without adequate liquidity, price discovery tends to be limited, and there is likely to be increased slippage during the execution of trades.

However, utilizing an order book model does not come without trade-offs. **By virtue of the order book design, dYdX is only able to provide standard LP earning activities to particular market makers rather than its wider user base**. Given that this is a core function of today's DeFi market, it may be seen as a disadvantage. Nevertheless, this shortcoming hasn't yet translated into an impact on dYdX's market share. **One factor offsetting this may be related to the protocol's attractive fee structure, which enables it**

to maintain a competitive edge amongst its peers. It is also likely that the unprofitable nature of several LPs in the ecosystem reduces the magnitude of the impact. After all, such a feature is essentially an add-on, and its absence does not markedly hinder perpetual market functionality.

Additionally, while the settlement layer exists on-chain for dYdX, the order book mechanism occurs off-chain through Amazon Web Services ("AWS"). This may not be entirely favorable for users, as it adheres to a more centralized framework and creates a potential source of failure. In fact, imperfections around decentralization transcend to other parts of the protocol as well. dYdX's insurance fund, which provides cover for bad debt, is directly controlled by the project team instead of being decentralized[14]. Such characteristics are bound to unsettle users who value decentralization. Though, in dYdX's defense, it isn't entirely uncommon for protocols to move toward decentralization gradually. **dYdX has recently shown this commitment by prioritizing decentralization over performance, as evident by their plans to launch an appchain on Cosmos**.

dYdX V4

dYdX is acutely aware of its deficiencies on the decentralization scale and aims to fill these gaps with the release of dYdX V4 later this year. **One of the significant upgrades in V4 has to do with the decentralization of their order book and matching engine, as trades will now be committed on-chain**. Put simply, each validator is required to run an in-memory order book off-chain. Orders will be propagated through the network and then matched by the network to ensure they are consistent with the order books of other validators.

The release also sees dYdX migrate from StarkWare to its own standalone dYdX chain built on the Cosmos SDK and Tendermint proof-of-stake ("PoS") consensus protocol. This will enable the protocol to leverage Tendermint's cross-chain capabilities and the potential of scaling its order book mechanism further. While dYdX's V4 iteration is largely untested, it does put the protocol in a fairly advantageous position regarding the maintenance of its dominance in the perpetuals space moving forward.

GMX

Since its inception, GMX has grown to become a major player in the decentralized perpetual contract marketplace. **The protocol stands as the largest dApp within the Arbitrum ecosystem by TVL, holding over US$480M.** Moreover, with a total TVL of US$576M, GMX outperforms other derivatives protocols, possessing nearly twice the TVL of its closest competitor, dYdX[15].

GMX was the first to pioneer the concept of shared liquidity pools, aiming to offer derivatives in some of crypto's most illiquid markets. **The protocol utilizes a unique multi-asset liquidity pool that deviates from the traditional models of multiple single-asset pools.** The rationale behind GMX's model is to maximize capital efficiency.

This approach is powered by a dual token model consisting of GLP, the liquidity pool token, and GMX, the platform governance token. **The success of GMX's model has even prompted over 40 protocols to fork its design and emulate its shared liquidity framework**[16].

The protocol operates a shared liquidity pool in GLP, which is formed by LPs purchasing and staking GLP and is available for users to participate in market-making directly[17]. Traders can borrow assets and open leveraged positions from the shared pool, effectively rendering GLP LPs as the counterparty to traders. **With GLP holders shouldering the risk of trades, protocol fees are divided between GMX and GLP holders at a 3:7 ratio.** GMX incentivizes its LPs by enabling them to earn fees from various avenues, including market making, swap fees, and leveraged trading.

Unlike other protocols, prices on GMX are not based on arbitrageurs or a constant product curve but are instead determined by Chainlink oracles and custom price feeds. This allows GMX to reflect up-to-date market prices without needing sophisticated market makers or deep levels of liquidity. **Indeed, this differentiation holds significance for GMX, as LPs aren't exposed to the impact of price discovery through impermanent loss, often seen in other AMM models**. While GMX relies on third-party infrastructure, its success is attributed to the ease of supplying liquidity and the fact that traders don't need to worry about the depth of liquidity. Considering the difficulty of maintaining liquidity during tighter market conditions, even more so in volatile markets, this is certainly an advantage for GMX.

Owing to the fixed prices supplied by the oracles, GMX can facilitate minimal slippage and zero-price-impact trades across numerous supported cryptocurrencies. **Though, despite onboarding a large number of users as a result of its highly attractive zero price-impact feature, GMX does not reflect the true cost of liquidity, which has at times put the protocol's long-term sustainability in question**.

While GMX's design does bring unique benefits, it also introduces specific risks for its LPs. For instance, during periods when the market is strongly trending either upward or downward, high-value traders might repeatedly open leveraged positions using the GLP pool. In this case, the pool would consistently lend out assets with a funding rate that isn't balanced between long and short positions. This is indeed a risk for LPs, as they could incur amplified losses if the market trajectory follows the traders' open interest. **Therefore, LPs will only continue to engage with GMX if the protocol's trading fees are able to adequately compensate for any GLP losses.** So far, we have seen GLP perform well in terms of maintaining sufficient fee allocations.

Having launched in September 2021, GMX has seen most of its growth in a bear market, and it remains to be seen whether the protocol can withstand the dynamics of a bull market. While the GLP pool design is relatively capital-efficient, its complexities may be a potential barrier to the protocol's ability to scale and support more asset types.

Nonetheless, GMX's apparent shortcomings may indeed be intentional trade-offs that have helped it generate organic demand and achieve product-market fit in the short-term.

GMX V2

GMX V2 introduces changes that markedly deviate from the design of GMX V1, bringing notable implications for high-volume traders and LPs[18]. GMX announced the public availability of its V2 testnet on May 17, 2023[19]. While the effects of these changes and how users will respond are still uncertain, below are some of the key points introduced by the upgrade.

- **Introduction of price impacts and funding fees: This update reduces the risk of price manipulation and helps balance long and short positions, thereby safeguarding LPs and ensuring a more equal distribution of risk.** On the flip side, the additional costs introduced may lower GMX's attractiveness, particularly for large-volume traders.

- **Lower trading fees:** The revised fee structure in V2 will halve the open and close fees to 0.05%, placing GMX on the lower end of the market fee range. **The fee reduction is seen as a concession for traders to counterbalance the newly introduced price impact and funding fee.** This has raised questions around potential impacts on profitability versus attracting more users for long-term success.

- **Isolated markets for each pair: V2 represents a major shift from GMX's multi-asset trading pool to isolated liquidity pools, allowing distinct trading between specific asset pairs**. This move gives LPs improved risk management and control within their selected market. However, bootstrapping liquidity might be a challenge due to fragmentation, with some pools possibly struggling to attract sufficient liquidity.

- **Integration of Chainlink's low-latency oracles: The integration of Chainlink's low-latency oracles into GMX V2 offers more timely data updates and better platform security, along with deterring frontrunning and boosting gas efficiency**. This integration also paves the way for additional order types, enriching GMX's user experience.

Gains Network

Gains Network, originally developed on Polygon and now expanded to Arbitrum, is another well-established platform. **It has emerged as a strong competitor in the market, with a relatively high daily trading volume at US$65.1M**. gTrade is Gains Network's perpetual trading platform, offering an extensive range of products across cryptocurrencies, stocks,

forex, indices, and commodities. **Similar to GMX, Gains Network utilizes a liquidity pool and relies on oracle-fed prices**.

The gDAI vault is the single liquidity pool that powers trading activity on Gains Network, with a collateralization ratio for supported assets dependent on trader profit and loss ("PnL")[20]. While this ratio enhances capital efficiency, it is relatively lower compared to other similar models, thereby introducing additional risk for LPs. Gains Network counteracts this risk through the provision of its unique tokenomics design, which has become an integral part of the protocol's success.

Within the vault, gDAI and other gTokens represent a user's ownership of DAI. **Though depositors in the gDAI vault receive a share of trading fees, they do not directly benefit from trader losses. Instead, losses are retained in the vault to serve as a buffer, safeguarding depositors from potential drawdowns while still earning trading fees.** To enhance the stickiness of liquidity, Gains Network offers incentives to depositors when the collateralization ratio falls below 100%, such as discounts of up to 5% on deposits up to a collateralization ratio of 150%[21]. This approach bears resemblance to MakerDAO's support of DAI loans.

In the event that the liquidity pool becomes under-collateralized, the Gains Network utility token ("GNS") would serve to guarantee the difference by being burned and minted. To protect the value of GNS, these transactions occur over-the-counter and are limited to 0.05% of the total GNS supply daily, with a portion of trader losses used to buy back and reduce the circulating supply of GNS. **GNS derives its value from the protocol's sharing of 40% of market order fees and 15% of limit order fees with users who stake GNS**[22]**.** Furthermore, as Gains Network progresses toward becoming a DAO, it plans to introduce a governance function to its native token.

While such mechanisms help drive the feasibility of the protocol, Gains Network has employed additional functional restrictions to absorb risk and ensure the sustainability of its product. Some of Gain Network's constraints include the following[23]:

- ◆ **Limit of three open trades per pair per wallet**

- ◆ **Subject to open interest caps per pair**

- ◆ **Maximum open collateral per asset**

- ◆ **Maximum upside is capped at 900%**

- ◆ **Minimum of 2x leverage**

Certain traders may find the trade-offs of the protocol undesirable, as it imposes restrictions not found on other platforms. This is evident from the PnL and high liquidation rate of gDAI, which indicate an unfavorable trading environment[24]. While these

restrictions aim to reduce risk for depositors, they have resulted in a notably lower annual percentage rate ("APR") for the gDAI vault compared to other competitors such as GMX's GLP. **It is likely that traders seeking higher leverage would prefer platforms without an upside cap, hindering Gains Network's ability to attract professional and institutional investors**. However, this may not necessarily be a shortfall, as the protocol inherently targets a different user group in retail traders.

For instance, while the Gains Network model shares similarities with GMX, there are certain differences regarding their liquidity mechanisms. **GMX's GLP is more complex and involves higher fees for LPs due to their exposure. On the other hand, gDAI has a simpler liquidity provision mechanism, making it more accessible for general crypto users.** This simplicity allows Gains Network to offer lower fees, making it a preferred option for beginner traders wanting to start their DeFi derivatives journey. **Gains Network sets a strong focus on its UI/UX design, offering a lightweight trading interface and exclusive features such as utility NFTs, guaranteed stop-losses, and one-click trading.**

Additionally, owing to its oracle model, Gains Network has the advantage of easily adding new trading pairs without the need for bootstrapping liquidity. This inherent flexibility empowers the protocol to support a diverse array of asset classes, a niche in which Gains Network has undoubtedly excelled. **In fact, Gains Network has become one of the strongholds in DeFi for on-chain forex trading, with open interest for forex on its platform at times surpassing crypto**. As a result, Gains Network has been able to sustain its growth.

Figure 10: Gains Network has demonstrated steady growth and notably established a strong presence in forex activity
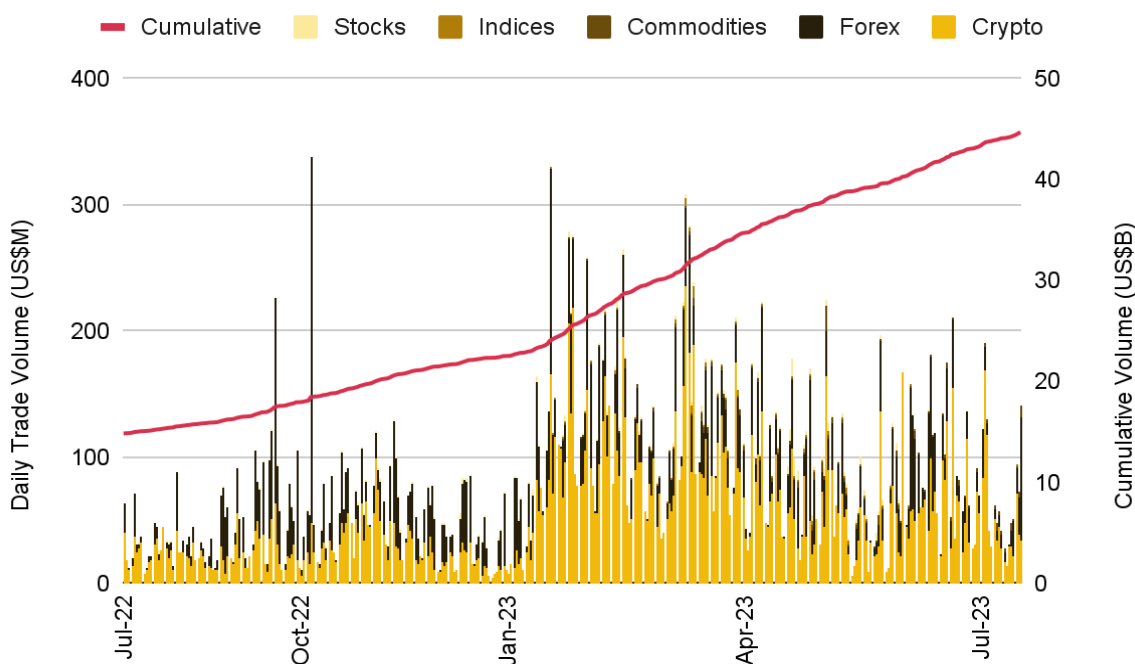
Source: Dune Analytics (@gains), Binance Research, as of July 29, 2023

There is no doubt that the trading constraints are a makeshift solution and a signal to the market of the protocol's fragilities in certain areas. **Nonetheless, recent adjustments, such as raising the upside cap from 400% to 900% and reducing the minimum leverage from 4x to 2x, demonstrate Gains Network's active efforts in filling the aforementioned gaps**. It is important to mention that moving parameters also opens the platform up to more risk, and the Gains Network team will have to be meticulous in ensuring that sustainability isn't impacted going forward.

Perpetual Protocol

Unlike typical AMMs seen on Uniswap and other DeFi platforms, [Perpetual Protocol](#) brings forth a novel concept with its vAMM. It effectively eliminates the need for real asset pools, transforming the conventional AMM model into a virtualized ecosystem. While Perpetual Protocol and its model may have experienced a decline in traction over time due to the emergence of newer players, its unique model still makes it a noteworthy protocol to consider.

At the heart of the vAMM model lies a smart contract vault, ensuring the safe management of all deposited assets[25]. The vAMM offers users the ability to deposit assets and receive synthetic tokens (e.g. depositing USDC gives vUSDC) in return for trading. **This approach creates an illusion of liquidity, mirroring the impact of depositing substantial amounts of assets into a Uniswap pool without actually requiring them.** This leads to a decoupled market structure that enables price discovery to occur independently from the underlying spot price. **A significant hurdle for vAMMs is the issue of liquidity. In situations where liquidity is shallow, opening or closing positions might result in unfavorable price movements**. Perpetual Protocol implements a 0.1% fee on all trades, with 80% of the revenue allocated to LPs and the remaining 20% directed to its insurance fund. This distribution ensures LPs are rewarded for their participation and establishes an insurance fund to safeguard against potential losses, enhancing the overall resilience of the protocol.

Additionally, the vAMM model actively participates in price determination by combining the time-weighted average price (TWAP) from Uniswap with average prices from other reputable exchanges, accessed via Chainlink. This integrated approach advances the simplicity of oracle price feeds used by platforms like Gains Network and enhances market stability through accurate price discovery. **While Perpetual Protocol's vAMM system aims to enable permissionless market creation, only listed assets are currently tradable on the platform.** The project has a long-term ambition to expand the scope of permissionless markets, which could materialize with greater overall market liquidity and the capability to support numerous active markets.

Perpetual Protocol introduced key improvements in its V2 upgrade, solving some of the shortfalls in its initial design. **One notable enhancement was the inclusion of a mechanism to balance long and short positions, setting it apart from competitors like**

GMX and dYdX. By using an oracle index price for funding rate calculations and liquidations, Perpetual Protocol is able to ensure market stability.

Perpetual Protocol differentiates itself from other derivative platforms by introducing single-sided liquidity deposits, a departure from the two-sided liquidity model. While this innovation brings advantages, it also presents associated risks for LPs, such as exposure to market fluctuations. Despite its complexity, the vAMM model in Perpetual Protocol offers a different approach to modeling perpetual futures within this space.

Kwenta

Kwenta is a perpetual frontend built on Synthetix and deployed on the Optimism network. **It has emerged as the primary platform utilizing Synthetix liquidity, contributing over 90% of the trading volume and revenue growth of Synthetix for much of this year**[26]. Kwenta experienced a substantial increase in trading volume beginning in mid-February 2023, sparked by the introduction of a trading incentive program. The incorporation of Optimism ("OP") tokens into its incentives program in late April further fueled an impressive uptick in trading volume[27].

Figure 11: Monthly trading volumes on Kwenta have increased by 1284.6% YTD
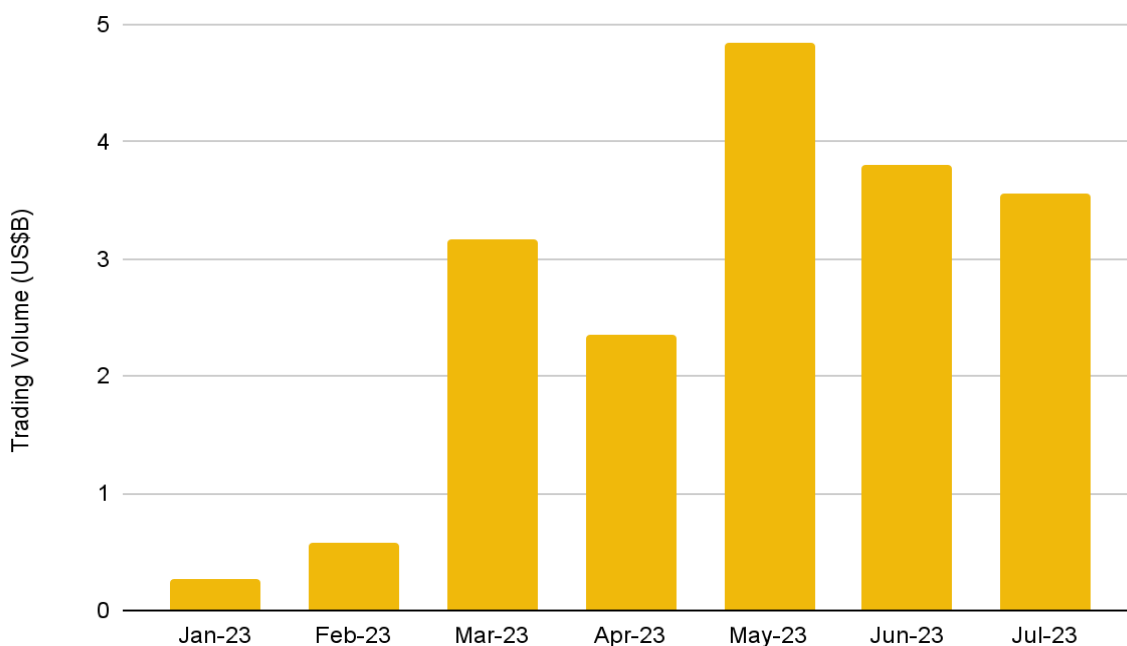
Kwenta operates as a margined DEX, utilizing Synthetix USD ("sUSD") through its proprietary margin engine[28]. **Liquidity for Kwenta is provided by Synthetix's debt pool, ensuring traders have access to the liquidity they require at any given price point**. What sets Kwenta apart from other perpetual models is its application of the skew balance method, which enhances the maximum open interest limit. Furthermore, Kwenta is equipped with an oracle-fed mark price hard-pegged to the index price, ensuring accurate

and real-time price information for LPs. This system empowers users with enhanced execution and funding rates while also mitigating price impacts. **The integration with Synthetix is certainly a differentiating advantage for Kwenta, as it unlocks composability and ensures access to ample liquidity, providing greater flexibility and control for its traders.**

Kwenta's fee structure involves collecting exchange fees and allocating them to Synthetix ("SNX") stakers while charging a dynamic exchange fee during volatile market conditions to protect stakers from front-running opportunities. The KWENTA token plays a governance role within the protocol and allows users to earn emissions when staked. Kwenta also offers trading rewards in the form of emissions, which are complemented by the recently introduced OP token incentives. **These incentives have been instrumental in driving trading activity to Kwenta, particularly in comparison to other platforms that lack a similar magnitude of rewards.**

While Kwenta's model favors LPs, it may exhibit some capital inefficiencies. **Its funding model ensures healthy and balanced open interest over time but leads to higher funding fees during imbalanced periods, possibly disincentivizing trading volumes**. Additionally, Kwenta relies on components from the Synthetix ecosystem, particularly sUSD, which has limited circulating supply and significant amounts locked in liquidity pools across DeFi. To scale further, Kwenta may need to diversify the collateral it supports. **Nonetheless, the platform's incentive program plays a crucial role in offsetting this potential shortfall for traders**. It remains to be seen how Kwenta will sustain its trading volumes post-OP incentives.

Recent developments and roadmap

Kwenta has recently made notable developments and laid out an ambitious [roadmap](#) for the future, with some of these highlighted below. As Kwenta continues to evolve as an independent entity from the Synthetix ecosystem with a strong focus on innovation, liquidity, and user-centric design, it will be interesting to observe the direction it takes moving forward.

- **Smart Margin V2:** The platform recently launched Smart Margin V2, introducing a comprehensive range of trading tools and a revamped trading UI/UX[29].

- **Integration with Lyra:** Collaboration is also a key aspect of Kwenta's growth strategy, as it recently partnered with Lyra to introduce options trading within its spot and derivatives trading tools. **These integrations expand the composability of Kwenta, providing traders with a wider array of opportunities to explore**[30]**.**

- **TWAP Perps:** Kwenta is planning to introduce TWAP Perps, which are perpetual futures designed to utilize Uniswap liquidity. **TWAP Perps will not only reduce fees**

and expand the availability of assets but also introduce new functionalities to Kwenta.

◆ **Synthetix V3:** Kwenta is working to integrate Synthetix V3, which will expand its range of synthetic assets and enhance its liquidity-as-a-service capabilities.

◆ **Kwenta SDK: The Kwenta SDK is set to facilitate third-party integrations, specifically targeting institutional traders by offering a suite of automated trading tools**. New features like Delegated Trading will also be introduced, enabling profit sharing through copy trading or script trading with the Kwenta SDK.

MUX

MUX is a cross-chain leveraged trading protocol available on multiple networks, including Arbitrum, BNB Chain, Avalanche, Optimism, and Fantom. MUX operates on a liquidity pool, MUXLP, and utilizes an index of assets for capital[31]. **With an impressive surge in monthly trading volumes by over 300% this year, MUX's cross-chain functionality and efficient trade execution position it for further growth in the sector**.

What sets MUX apart is its unique leveraged aggregator function, a sub-protocol introduced in its recent V2 upgrade, and its integrations with prominent DEXes like GMX and Gains Network[32]. Complementing the existing MUXLP pool, this function is engineered to optimize trade routing across multiple protocols based on market conditions, position size, and user preferences. **This enables MUX traders to concentrate solely on trading, free from concerns about LPs.** By taking into account multiple factors like price, spread, slippage, and fees, MUX's model is able to significantly mitigate trading costs. The protocol also has a novel universal liquidity mechanism. **Through a broker module, it monitors, calculates, and fills orders based on the available liquidity across networks. This enhances capital efficiency across multiple chains without necessitating the movement of pooled assets.**

Interestingly, MUX incorporates a multifaceted token model featuring MCB, MUX, and MUXLP. Figure 12 below also considers veMUX, a vested token, given its specific role within the MUX protocol.

Figure 12: The MUX Protocol assigns distinctive roles to several tokens

Token	Description
MCB	The primary token of MUX. Vesting MCB results in veMUX, enabling holders to partake in governance and earn protocol income.
MUX	This is a non-tradeable reward token, which users earn by staking MUXLP or holding veMUX.

MUXLP	Plays the role of the LP token. Staking MUXLP supports the platform's liquidity and grants users rewards.
veMUX	Generated by locking MCB or MUX. This non-tradable token offers holders governance power and a portion of the protocol's income.

Source: MUX Documentations, Binance Research

Additionally, MUX offers one of the highest leverages available in DeFi, 100x on integrated protocols, effectively addressing common issues faced in perpetual DEXes such as fragmented liquidity and price volatility. In line with its objective of becoming an all-in-one platform, MUX aims to integrate with an increasing number of protocols, thereby providing traders access to diverse markets. **Therefore, MUX's strength undoubtedly lies in its ability to leverage the composability of DeFi.**

MUX V3

V3 is the upcoming upgrade of MUX's derivatives platform, with a central focus on enabling cross-chain aggregation. This feature aims to integrate derivatives liquidity from multiple networks such as Arbitrum, Optimism, BNB Chain, Avalanche, and Fantom.

With the growing adoption of on-chain activity for perpetual futures, MUX has the potential to establish itself as the sole aggregator for these derivatives, giving it the opportunity to develop a clear product-market fit and niche for itself in the marketplace.
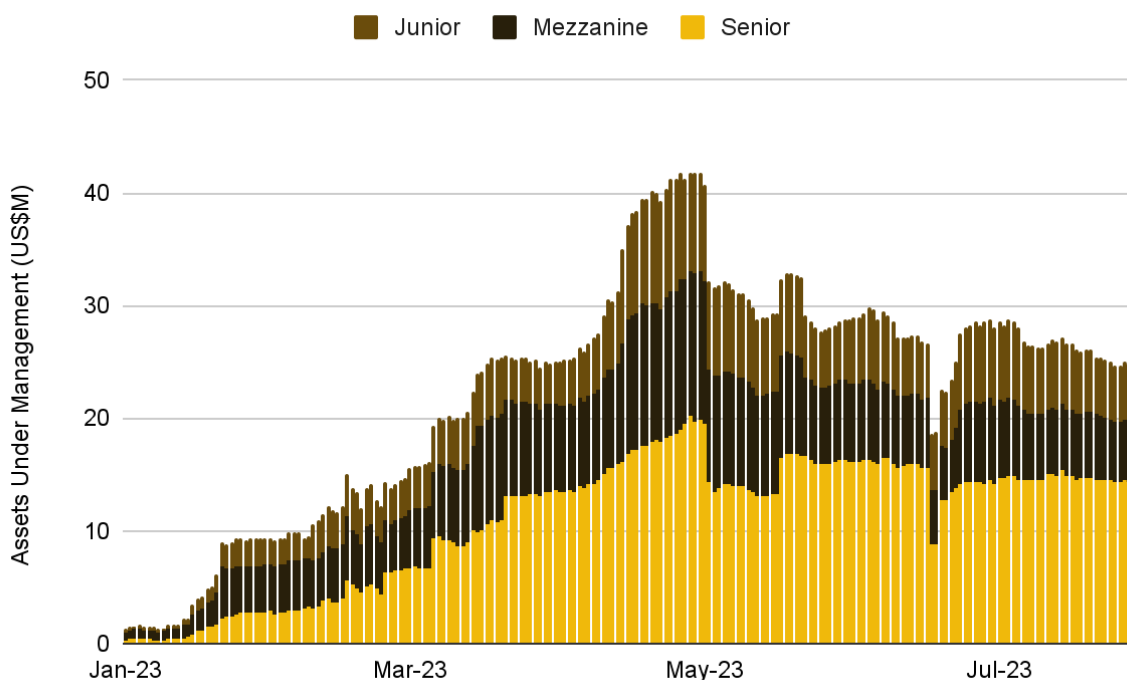
Level Finance

Level Finance is a relatively new entrant, primarily operating on the BNB Chain but having recently expanded to Arbitrum. Since its launch in December 2022, the protocol has shown promising growth, with its daily trading volume often ranking third, trailing only dYdX and GMX. **Similar to GMX's GLP, Level Finance employs a liquidity pool model but distinguishes itself with a unique strategy for managing risk for its LPs.**

Level Finance's standout feature is its novel liquidity provisioning model, dubbed Risk Management for Liquidity Providers ("RMLP")[33]. This system classifies LPs into three risk/reward tranches: Senior, Mezzanine, and Junior. These trenches indicate the underlying exposure of LPs to the assets within each pool, along with the PnL generated by traders on the platform. When a trade is initiated, liquidity is proportionally drawn from these three tranches, with fees also distributed in proportion based on the asset's volatility. **This structure allows for liquidity to effectively adapt to demand; when demand for higher-volatility assets increases, junior tranches yield higher returns, thereby attracting and directing liquidity where it's most needed.** The protocol regularly achieves triple-digit APYs, making it an attractive proposition for LPs, and this is evident from the growth in assets under management ("AUM") across its tranches.

In cases where a tranche needs more liquidity, which often happens with the middle-tier tranche, these incentives are given through the protocol's utility token. **Level Finance adopts a dual token model consisting of a governance token ("LGO") and a utility token ("LVL")**. Both tokens provide 10% of protocol revenue for staking a range of assets, with no lockup. **Ultimately, Level Finance's compartmentalized approach indicates a strong alignment with the broader DeFi trend of enhancing capital efficiency**.

Figure 13: Level Finance's AUM has been steadily rising, driven by attractive yields, with the low-risk Senior tranche attracting the most capital

Source: Dune Analytics (@levelfinance), Binance Research, as of July 29, 2023

While Level Finance presents promising features, it's not without limitations, much like any other emerging protocol. **High token emissions, recent security incidents, and occasional high trading fees pose challenges.** Nevertheless, Level Finance's status as a top-tier perpetual futures DEX on the BNB Chain gives it a distinctive edge in attracting users, particularly given that many competitors operate on other networks. Interestingly, we observe a recurring trend on other networks where one protocol often dominates trading volumes: dYdX on StarkEx, GMX on Arbitrum, and Kwenta on Optimism. Though, this is yet to be seen for BNB Chain. **Ultimately, Level Finance's attractive APYs for LPs, efficient product offerings, and multi-chain initiative build a strong foundation, potentially serving as a growth catalyst for the platform moving forward**.

5 Options

Despite its smaller size compared to the perpetual futures market, DeFi options are a highly sought-after product, having accumulated a cumulative TVL of over US$100M to date[34]**.** Options are an integral part of TradFi, and replicating a self-sufficient decentralized version will certainly be a key milestone for the DeFi industry.

While the potential for options is undeniable, they are inherently complex financial instruments by design. Consolidating liquidity in option markets is challenging due to their non-linear pricing dynamics and fragmentation across several dimensions (e.g., calls and puts, each with multiple strike prices across multiple expiration dates). Add to this the lack of economic incentives currently available for LPs, which leaves options markets with low liquidity, making it difficult to execute large trades. **Such characteristics have made option contracts notoriously difficult to model and contributed to the traction of other types of derivatives in the space**. This is also why crypto options activity has predominantly occurred in CEXes thus far.

Yet, the non-linearity of options provides exposure to volatility and other factors that are not available in perpetual futures, making them highly desirable for advanced investment and risk management strategies. Ultimately, this leaves an immense opportunity for projects to fill the void of options products in a rapidly maturing DeFi ecosystem.

As a result, we are seeing numerous on-chain protocols now offer vanilla options trading utilizing various models, including order books, AMMs, and concentrated liquidity pools. The majority of activity has been centered on AMM and liquidity pool-based models as opposed to order books, which have generally required a higher transaction throughput. **Another emerging category is options vaults, which sit atop option marketplaces, providing structured products with options-based yield strategies like covered calls or cash-margined puts.** While the classification of models used for options is similar to perpetuals, there are slight differences, as explained below.

- ◆ **CLOBs:** To remind ourselves, central limit order books are public marketplaces for recording buy or sell orders, with most protocols today supporting minting and settlement but not the trading of options. **Order book protocols, such as Ribbon Finance's Aevo, provide a platform for trading pre-priced options contracts**. They allow market makers and others to directly match orders at specific prices without needing an infrastructure protocol.

- ◆ **Infrastructure: These protocols provide the underlying order book infrastructure, enabling entities like market makers and options vaults to create, settle, and trade options.** Market makers act as underwriters, while options vaults price and sell options. Opyn is a protocol that adopts an infrastructure order book model.

- ◆ **AMMs:** AMMs leverage algorithms, allowing users to buy or sell assets, with transactions executed at the best available price based on the market's supply and demand. **AMMs for option markets can be divided into two categories:**

  - ○ **First-generation AMM: This model permits only option buying from the AMM, with LPs invariably taking the contract's short side.** First-generation AMMs avoid delta hedging due to its capital inefficiency and favor greater liquidity to boost option sales.

  - ○ **Second-generation AMM: Second-generation AMMs enable users to buy or sell options with LPs, who can hold either short or long positions, serving as the counterparty**. This model hedges exposure or reutilizes collateral for yield enhancement.

- ◆ **Concentrated liquidity pool: While it may be considered a subcategory of option AMMs, this novel model utilizes established AMMs like Uniswap, aiming to capitalize on their deep liquidity to overcome typical liquidity challenges.**

- ◆ **Structured products:** Options vaults are a type of structured product that uses options to automate investment strategies, often through option selling. **These vaults provide users exposure to options through a simplified deposit and earn experience, with Ribbon Finance serving as a prime example.**

We will now explore different projects, providing further insight into the applications of some of the above models in today's options markets.

**Figure 14: Comparative snapshot of key details and metrics of options protocols**

	Lyra	Dopex	Opyn	Ribbon Finance	Panoptic
Protocol Details					
Launch	Sep 2021	Nov 2021	Feb 2020	Apr 2021	TBC
Model	Second-generation AMM	First-generation AMM	Infrastructure Order book	Structured Product	Concentrated Liquidity Pool
Blockchain	Optimism, Arbitrum	Arbitrum, Polygon, Avalanche	Ethereum, Polygon, Avalanche	Ethereum, Avalanche, Solana	Ethereum
Token	LYRA	DPX, rDPX	-	RBN	-
Key Metrics					
TVL (US$M)	23.3	21.4	30.8	26.3	-
Market Cap (US$M)	33.4	23.9	-	62.8	-
Daily Users	36	22	3	5	-

Source: Project teams, Token Terminal, DeFiLlama, Dune Analytics (@ribbon, @rebeca), Binance Research, as of July 31, 2023

Lyra

Deployed on Optimism and Arbitrum, Lyra is a leading options protocol based on a second-generation AMM model. **Despite offering fewer markets than some competitors, the protocol boasts the largest daily trading volume of US$586.6K in today's options market**. The protocol achieved a key milestone earlier this year, as it posted trading volumes totaling US$121.6M during March. Additionally, Lyra's open interest, which serves as an indicator of organic volume, has also exhibited an upward trend for much of this year. **This growth can be largely attributed to its recent deployment on Arbitrum**[35]. Built atop Synthetix, Lyra prizes itself for its composable architecture and familiar options trading experience.

Figure 15: Open interest on Lyra has increased since deploying on Arbitrum, with the majority of users now favoring Arbitrum as the primary chain to trade on
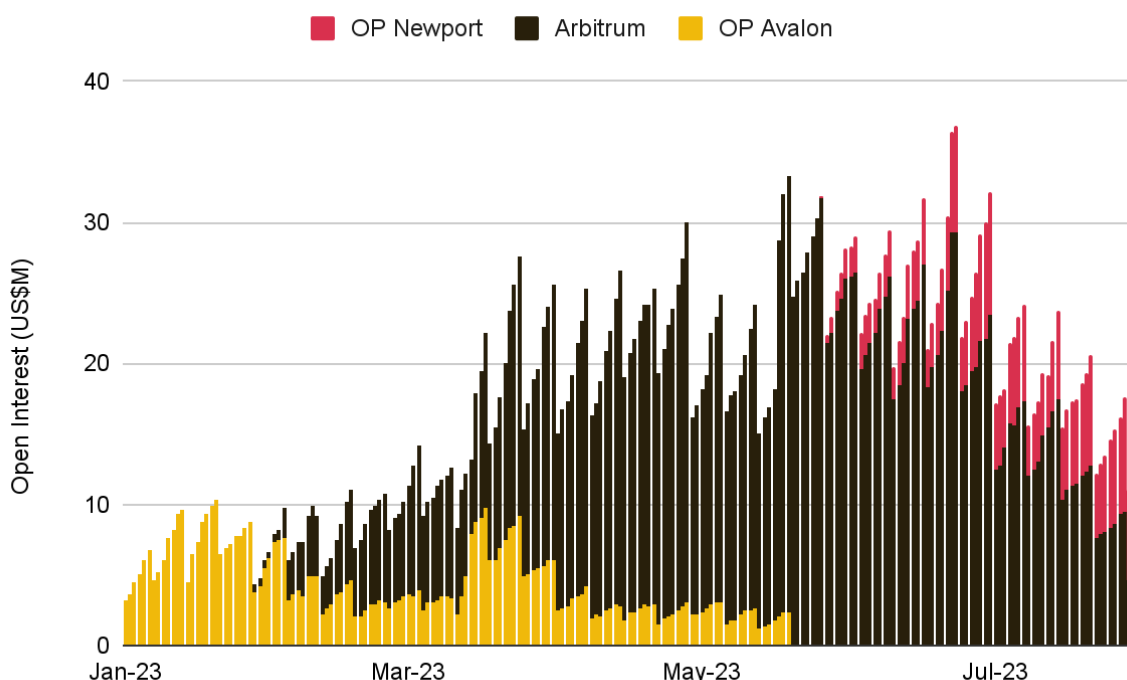
Source: Lyra Finance, Binance Research, as of July 29, 2023

Lyra's second-generation AMM model is centered on asset-specific market maker vaults, with an emphasis on hedging exposure and redeploying capital to enhance yield[36]. LPs deploy either USDC or sUSD to fund the liquidity pool and are incentivized to do so by receiving a share of trading fees and additional yield from option spreads and option value decay. Lyra imposes flat swap fees, variance fees, and dynamic fees tied to vega risk contributions. **Though given the fee's variability, it may result in traders occasionally facing higher costs, similar to how traditional order book models widen spreads during volatile periods**. Since the start of the year, Lyra has generated over US$14m in fees. Lyra's model features two unique characteristics:

- LPs can hold either short or long options contracts.

- Options traders can enter specific short positions against the AMM, similar to the trading experience on CEXes.

This model strives for delta neutrality, enabling LPs to better manage risk and motivating traders to take on the unbalanced side of the trade. The rationale stems from the fact that LPs in options markets are subject to delta risk if the underlying asset price shifts. To counter this, Lyra employs hedging strategies using other derivative protocols like Synthetix or GMX and levies a vega hedge fee for trades that increase the AMM's vega exposure.

Given the liquidity challenges in DeFi options markets, it's important to consider the value of hedging for LPs, as its significance comes into play only if potential losses outstrip premiums earned from option sales. **While hedging via other protocols can mitigate risk, the high collateral ratio requirements of platforms like Synthetix cause Lyra to lock up substantial capital, potentially resulting in capital inefficiencies and constrained access to liquidity for traders**. Additionally, the non-linear aspect of options adds layers of complexity to the hedging process. Nevertheless, Lyra's approach does provide LPs with the benefit of delta neutrality, which is certainly an advantage if the market faces prolonged periods of bullish or bearish trends.

Furthermore, Lyra's support for partially collateralized short positions is another notable feature. Lyra encourages liquidators to manage under-collateralized traders through penalty fees. Upon completion of the liquidation process, the liquidator's account closes, effectively mitigating risk. This approach, together with an insurance fund, safeguards the platform and its users in the event of liquidation mechanism failures.

In terms of option pricing, Lyra employs a combination of an AMM and the Black-Scholes framework. The Black-Scholes model factors in the underlying asset's value, strike price, risk-free interest rate, expiration date, and implied volatility. The latter is extracted from Lyra's AMM and determined by the market's supply and demand for an option. However, as this method relies on moving market variables and operates without a professional market maker, its accuracy may sometimes be called into question.

Overall, Lyra has effectively positioned itself as a key player in the nascent options market. **While it supports a range of features and advocates delta neutrality for LPs, the lack of revenue-sharing mechanisms could potentially drive users toward alternative platforms.** Lyra's heavy reliance on Synthetix may also pose liquidity issues in the long term if no successful pivot is found. Despite this, Lyra's dominance in TVL and daily trading volumes showcase its potential to continue capturing market share in a sector still on the lookout for its own GMX or dYdX.

Dopex

As another derivatives protocol operating on Arbitrum, Dopex has emerged as a strong competitor within the options market and is one of the largest options protocols by TVL at US$20.9M. **Dopex is powered by a first-generation AMM model, and while it does not have the widest range of assets available, Dopex supports more products than some of its second-generation AMM counterparts**.

Operating on a first-generation AMM model, Dopex differs from protocols like Lyra that use a second-generation AMM model[37]. **Users on Dopex can only buy options contracts from the AMM, which effectively places the LPs on the short side of the options contract**. This might seem restrictive, but allowing positions to be sold back to AMMs also has its constraints, such as exposing the trader to amplified risks of price volatility and time decay.

Dopex doesn't maintain a delta neutral position, which means that LPs don't benefit from Dopex's hedging against exposure to maintain a constant delta. This strategy is motivated by concerns over capital inefficiency. Delta hedging often necessitates using a portion of the liquidity pool to back long or short positions based on the net delta of their shorting positions. Instead, Dopex focuses on selling options at higher premiums, which consequently demands more liquidity. However, this approach leads LPs to bear greater exposure to the underlying assets, which may increase liquidity costs and possibly slow down the liquidity pool's growth. At times, this approach has led to weak liquidity, with options selling out quickly due to insufficient depositors.

Dopex's Single-Staking Option Vaults ("SSOVs") have been notable for managing the risks associated with LPs. Here, LPs offer liquidity to chosen vaults, pledging collateral to a smart contract for a specified expiration duration. While this gives users increased control over the options they underwrite, it shifts some of the burden onto end users and may result in additional liquidity fragmentation.

For the pricing of options, Dopex employs a Black-Scholes AMM model that relies on pricing functions built into the smart contracts. Occasionally, this model faces challenges in accurately computing implied volatility as a result of inconsistent demand and supply flows. Unlike CLOB-based models, which can dynamically adjust their quotes as they assimilate fresh price information. Therefore, in volatile markets, LPs may face high impermanent losses as the implied volatility may be substantially lower than the realized volatility.

Furthermore, Dopex offers innovative products such as Atlantic Straddles and Interest Rate Options, reinforced by a token model that offers incentives to option sellers. Benefits associated with its native token include features such as revenue sharing, trading fee rebates, and a voting mechanism tied to liquidity rewards. Despite carving out a relatively strong TVL in a nascent market, Dopex faces increasing competition from second-generation AMMs and concentrated liquidity pool models. Overcoming its liquidity challenges will be a key area of focus as Dopex seeks to build upon its traction.

Opyn

Opyn is one of the earliest option-based protocols and currently holds a commanding TVL of US$30.2M. The protocol utilizes an order book model that relies on an infrastructure layer for the on-chain minting of options contracts[38]. While it has deprecated its on-chain order book via 0x, Opyn's recent focus has shifted to Squeeth, offering structured products via its Crab Strategy vault. Opyn's infrastructure-centric design has been a key driver for its progress, enabling the protocol to offer a broad range of assets. Despite a recent decline in market share, Opyn stands as a key player in the options market, and it has carved out a niche by targeting an addressable market at the protocol level.

Opyn provides the underlying infrastructure for options trading, allowing other protocols to mint, sell, and trade options contracts but not perform any pricing on the options themselves. **Its permissionless infrastructure has proven appealing to market makers interested in underwriting options within decentralized markets**. Ribbon Finance, for instance, leverages Opyn's infrastructure for its decentralized options vaults[39]. Through Opyn's model, users underwrite contracts and determine the pricing and maturity of the option themselves. **While this model provides LPs with greater control, it can be relatively challenging for non-institutional investors to adopt**. This is because individuals are faced with the task of minting, pricing, and marketing the options themselves.

Compared to AMM-based models, Opyn doesn't typically make it feasible for LPs to take a passive stance when deploying capital. Given the constant requirement of checking orders on-chain, order book models tend to encounter issues with scalability and latency, leading to increased costs and time to execute trades. While scaling solutions have alleviated some of these issues, there is still scope for improving the efficiency of on-chain order books further.

Additionally, Opyn made its mark as the first protocol to introduce partial collateralization for DeFi options, allowing traders to engage in the markets more efficiently. By setting conservative margin requirements based on collateral size, premium to volume ratio, and time to expiry, Opyn addressed an issue that typically challenges other AMM-based options protocols. **While Opyn's future is largely contingent on market trends, its distinct infrastructure and focus on the institutional market make it interesting to watch how it will further capitalize on these aspects**.

Ribbon Finance

Ribbon Finance is a leader in the options market for structured products, commanding a TVL of US$26.3M, a figure that surpasses twice the amount secured by its competitors in the options vault space[40]. Despite facing increased competition and experiencing a dip in its TVL over time, Ribbon has retained a large user base and maintains a strong capital base. With a diverse range of products, Ribbon's entry into the options trading space with the recently introduced Aevo signifies its ambition to grow further[41]. The following is a brief overview of Ribbon's product offerings[42]:

◆ **Decentralized options vaults ("DOVs"):** DOVs represent Ribbon's flagship product, enabling automated option selling for depositors, mainly through the sale of covered calls and cash-secured puts.

◆ **R-Earn:** R-Earn vaults are principal-protected vaults that utilize a minor portion of capital and/or yields earned from various options strategies to drive higher returns.

◆ **R-Lend:** This is Ribbon's uncollateralized lending product. It generates yield by lending USDC deposits to chosen institutions. Capital from R-Earn is also channeled through R-Lend.

◆ **Aevo:** Ribbon's recent addition, Aevo, is a fully-fledged order-book options DEX. We will be exploring Aevo a little more depth below.

Ribbon DOVs have gained traction as an accessible channel for novice investors looking for exposure to options markets. By automating investment tools, DOVs circumvent the need for users to navigate through complex choices of expiration dates or strike prices. DOVs allow users to deposit collateral in a smart contract that provides a structured option payoff, typically for a fixed period of time. While Ribbon DOVs enable participation for passive or retail traders, they might dissuade advanced traders, who are likely to represent a substantial portion of the nascent options market.

Ribbon predominantly relies on Opyn and, to a lesser extent, Zeta to create the options sold in its vaults, as well as Market Makers to purchase the options being auctioned by the vaults. Many structured products depend on centralized, non-transparent auctions to sell and price options. Although this process saves time and resources, it also opens the door for potential conflicts of interest as sellers aim to maximize option premiums while buyers, or market makers, strive for the lowest possible price. Moreover, the decision-making on premiums and strikes of the options primarily rests with the teams, exposing LPs to uncertain outcomes.

While DOVs were initially a profitable proposition for both retail and institutional investors, their vulnerability to market volatility resulted in substantial losses. Rising competition and the instability of the market have led to a significant decrease in deposits as DOVs struggle to yield consistent returns. **To put this in perspective, Ribbon's DOVs reached a high of over US$270M in TVL in 2022 and has since plummeted to below US$30M in TVL today**[43]**.** Given these market fluctuations, Ribbon's business model can be thought of as a flywheel, where the creation of yield-generating products propels an increase in deposit inflows to its vaults. Conversely, periods of market volatility leading to losses can trigger a decrease in deposit inflows, subsequently reducing the TVL for Ribbon's DOVs.

Figure 16: Ribbon DOV returns have been affected by market volatility, with lower yields contributing significantly to the decline in TVL
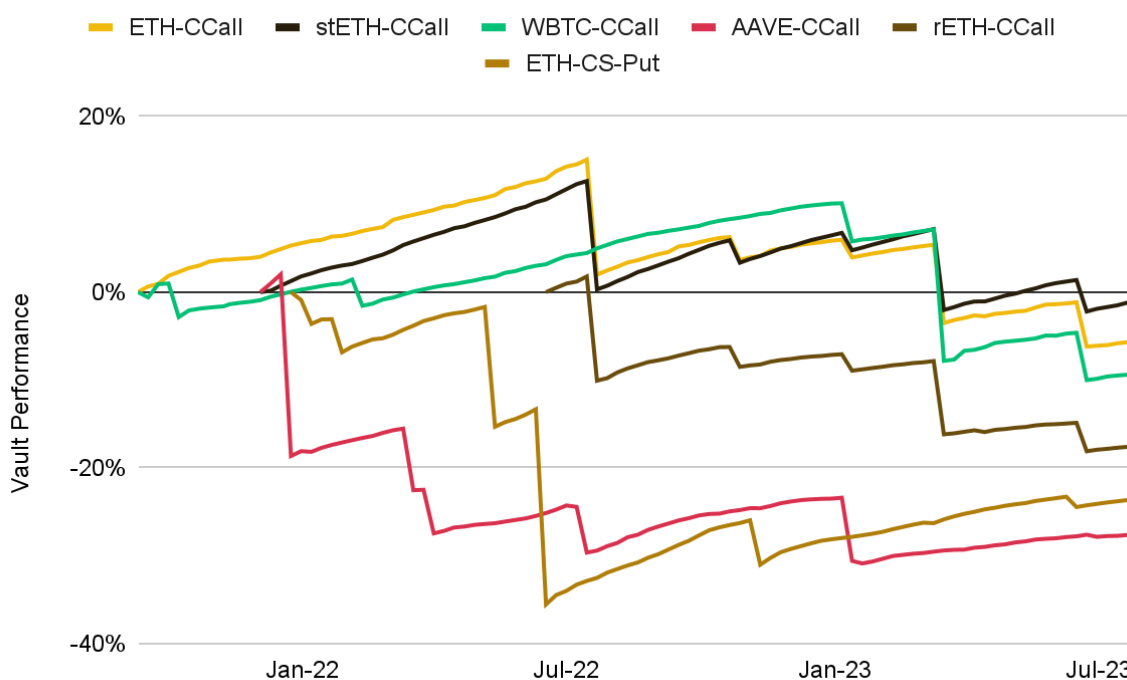
Nevertheless, Ribbon's yield narrative, token incentives, and revenue-sharing mechanism made it one of the first protocols to secure traction in the options vault space. **However, faced with increasing competition and declining TVL, it's clear that Ribbon continues to strategically pursue different avenues in trying to build a highly scalable, liquid venue to trade options**. For example, to diversify its reliance on DOVs, Ribbon introduced R-Earn and R-Lend, offering lower-risk alternatives for its users. **The introduction of Aevo seems to be Ribbon's latest approach to reigniting its positive flywheel, aiming to attract more depositors and generate new revenue streams**.

Aevo

Ribbon officially introduced Aevo earlier this year, which is an order book options protocol. **This new platform is anticipated to serve as the future liquidity venue for Ribbon's DOVs**[44]. Aevo is powered by Ribbon's new optimistic rollup known as the Aevo Chain, which was built using the OP Stack[45]. **Aevo is targeting professional traders interested in trading on-chain options with greater flexibility than that offered by options vaults.** Similar to dYdX, Aevo's matching engine and order book are presently off-chain, although the settlement process takes place on-chain.

Figure 17: Aevo has experienced rapid growth in both user numbers and deposits within a short period of time
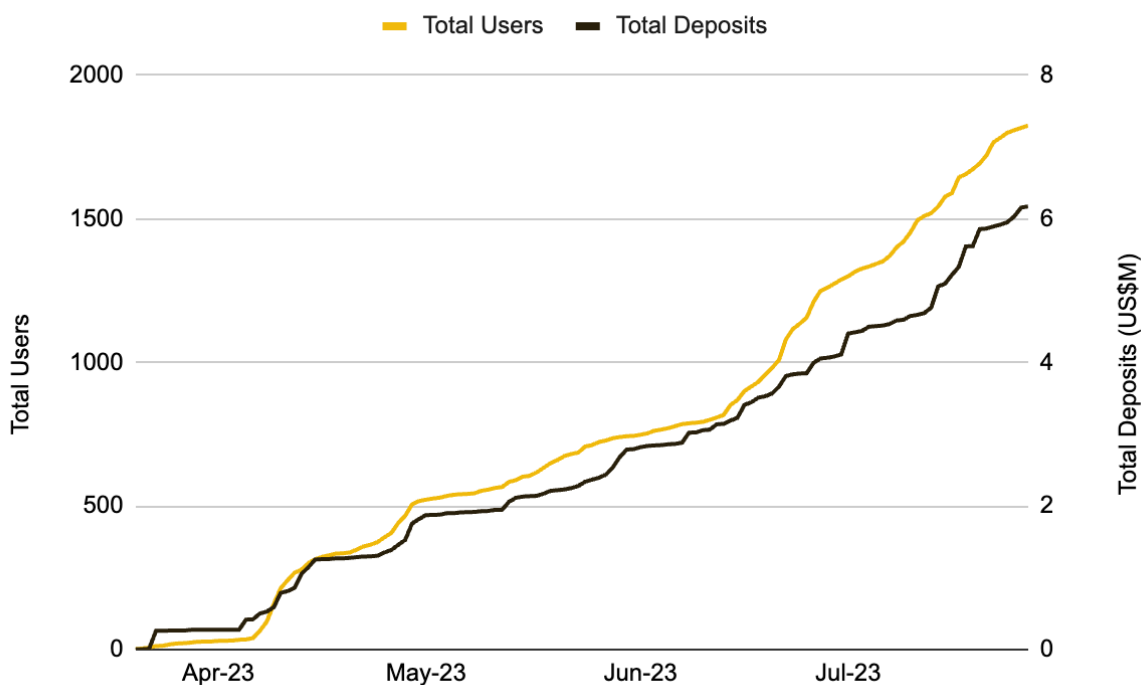
Source: Dune Analytics (@holmberg15a), Binance Research, as of July 29, 2023

Aevo offers both options trading and perpetual products, enabling delta hedging for traders on the same platform. **It plans to offer numerous trading instruments with a variety of strike-expiration options, enabling Ribbon to deliver more comprehensive structured-product vaults than other DOV protocols.** Additionally, Aevo will generate revenue from fees on every trade, liquidation, and settlement, including those implemented through Ribbon's DOVs. Aevo also brings flexibility and capital efficiency to Ribbon DOV depositors and market makers, allowing them the convenience to close their vault positions at any time and use these positions as margin to access leverage.

Aevo presents a valuable opportunity for Ribbon to fill a gap in the options DEX market and provide synergistic benefits for its DOVs. However, it must navigate challenges related to efficient option pricing, liquidity, volumes, and hedging mechanisms. **Though it's early days, Aevo's launch expands Ribbon's product suite, and its potential impact on Ribbon's existing offerings is worth monitoring**.

Panoptic

As Panoptic is a relatively newer project in the space, with its mainnet launch still pending, its performance in the options market remains to be seen. Nonetheless, we will briefly examine the protocol to gain insight into its concentrated liquidity model.

Panoptic incorporates a novel model where AMMs like Uniswap serve as the base layer for options markets[46]. **This model capitalizes on the pre-existing liquidity in AMMs to**

address the prevailing liquidity issues often witnessed in options markets. Therefore, AMMs function as a liquidity layer, which paves the way for other derivatives, such as options DEXes with similar payout attributes, to be developed on top. **Panoptic's solution addresses a problem that often hinders growth in options markets: insufficient liquidity impedes the onboarding of traders, and the scarcity of traders deters LPs**. By deploying liquidity into Uniswap V3, Panoptic not only enables its LPs to reap trading fees but also offers the familiar payoff structure of vanilla options, making the protocol an attractive proposition for options traders. In summary, the Panoptic ecosystem is primarily composed of LPs, traders (option buyers/sellers), and liquidators.

Figure 18: Panoptic utilizes LP positions in Uniswap V3 as a foundational component for trading long and short options
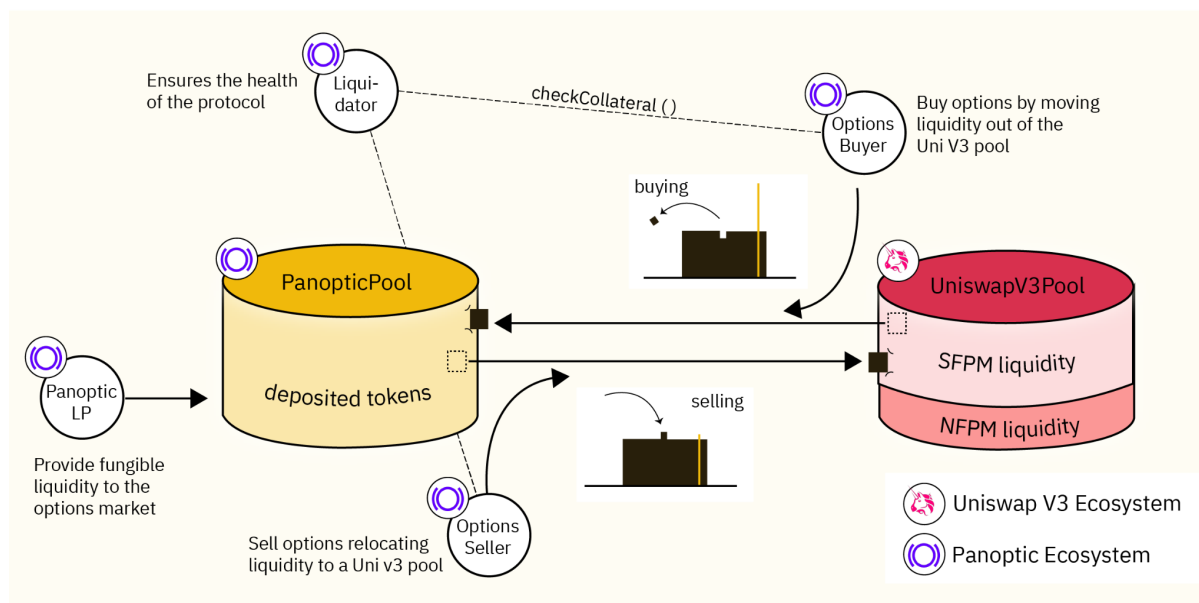
Source: Panoptic Documentations, Binance Research

Panoptic also offers undercollateralized trading with leverage and liquidations, without cross-collateralization, and charges buyers and sellers based on pool utilization. **This feature might potentially make Panoptic an attractive choice for some traders currently utilizing CEXes or DEXes like AMMs or on-chain order books**.

Nevertheless, the performance of this novel model remains to be seen, and it will be essential for Panoptic to convince Uniswap LPs that their risk-adjusted returns are superior to depositing on Uniswap directly. Therefore, as the protocol ventures into tackling the liquidity issue using Uniswap or other AMMs, the success of this model will be one to monitor closely as Panoptic progresses toward mainnet launch.

⑥ Outlook

Market Landscape

The early successes of dYdX and GMX have significantly contributed to their dominance in the perpetual futures market. Indeed, both protocols currently hold 64.9% of the trading volume market share, though this figure was higher at the beginning of the year at 88.6%, indicating a slight erosion of their market share over time. **Meanwhile, emerging protocols like Kwenta, Level Finance, MUX, and Vertex Protocol have been gaining traction, with Kwenta notably surpassing GMX to claim over 11% of market share in July**. The introduction of newer protocols alludes to the market's strong propensity to consume innovative products. Yet, despite the competition, dYdX maintains a substantial lead in perpetual futures trading volume, generating over five times more in monthly trading volume than its competitors.

Figure 19: dYdX leads the market with over 57% of perpetual futures trading volumes, while Kwenta recently surpassed GMX
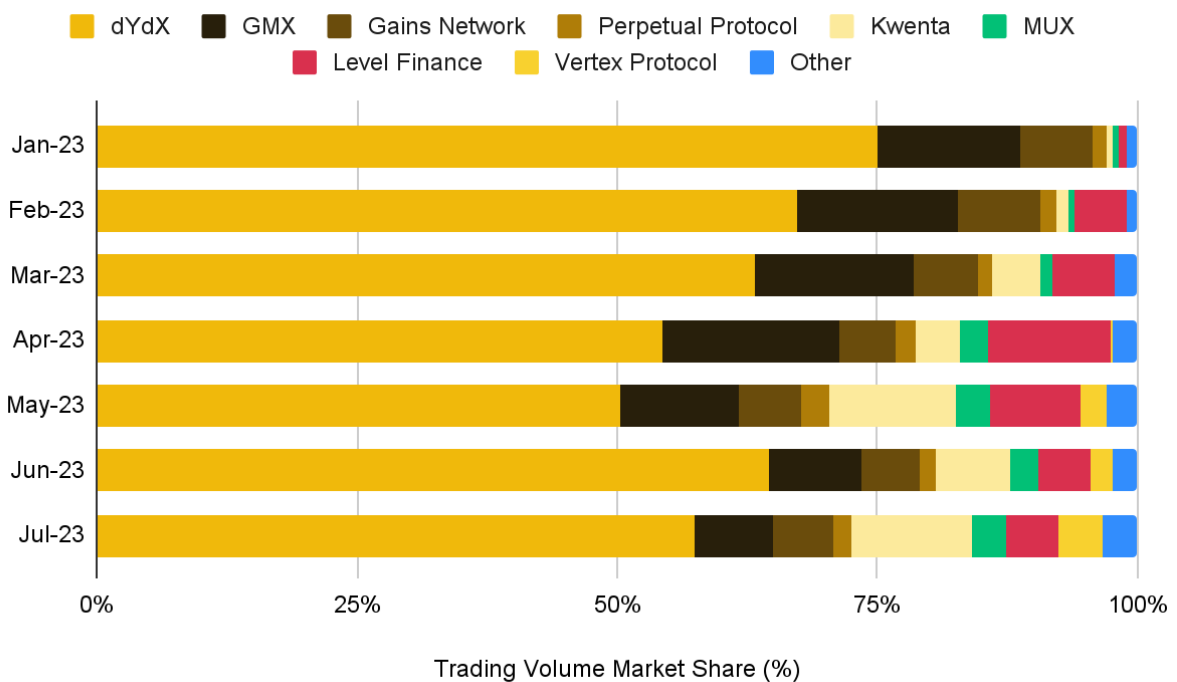
Source: Token Terminal, Binance Research, as of June 29, 2023

Despite dYdX's dominance in trading volumes, GMX has consistently led in fee generation, amassing over US$94M this year. **GMX's high fees contribute to its attractive model, generating lucrative real yields for token holders and LPs**. Notably, GMX also earns more revenue than the token rewards it provides, indicating organic revenue and a sticky user base. **Meanwhile, since its launch in December 2022, Level Finance has rapidly become the third-largest platform in terms of monthly fee collections**.

Figure 20: GMX has consistently generated the highest fees this year
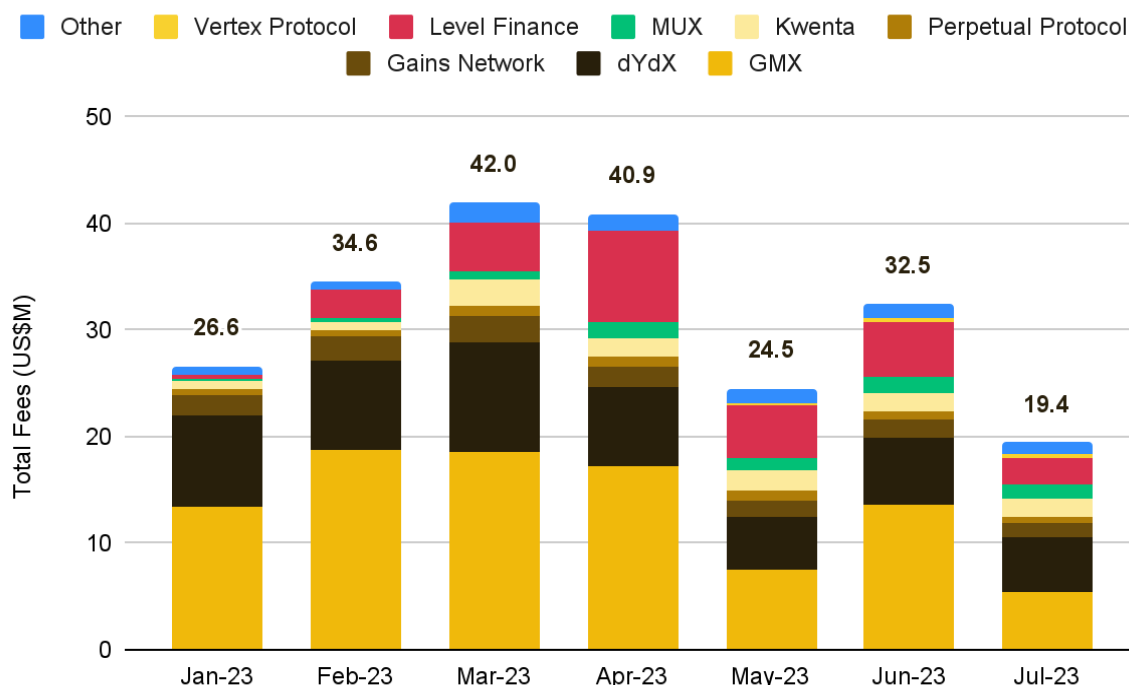
Source: Token Terminal, Binance Research, as of June 29, 2023

Protocol earnings (revenue minus token emissions) are a critical measure of sustainability. **Unsurprisingly, GMX has the highest cumulative earnings due to its superior fee generation**. Gains Network is also among the top earners, largely due to its robust community and ability to deliver yield without resorting to token emissions. Although in the negative, dYdX has started to reverse the trend after decreasing incentives by 45%, earning US$357.2K in July.

Figure 21: GMX has had the highest cumulative earnings since the start of the year
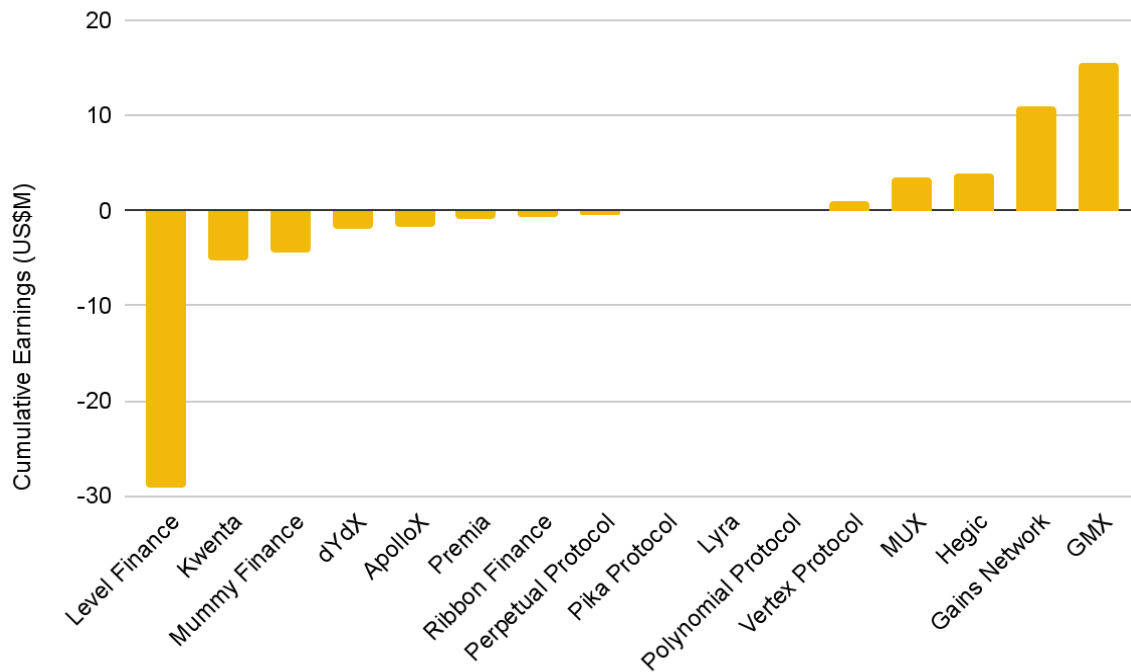
Source: Token Terminal, Binance Research, as of July 31, 2023

Taking a closer look at the options market, Lyra maintains its dominance, contributing over US$580M in trading activity YTD. While Dopex and Opyn attract relatively higher TVL, both protocols are facing decreasing amounts of trading activity. In fact, other protocols such as Hegic and Premia have at times exceeded Dopex and Opyn in trading volume this year.

Figure 22: Lyra has been the primary venue for options trading volume since the beginning of the year
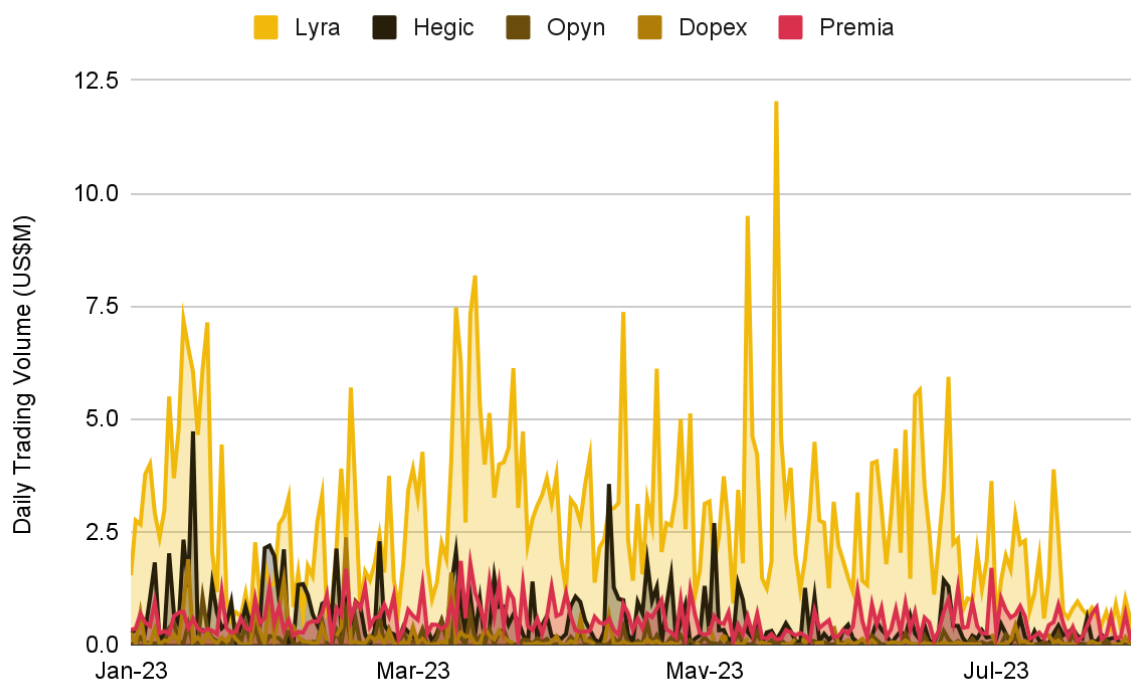
Source: Token Terminal, Dune Analytics (@impossiblefinance), Binance Research, as of July 31, 2023

Lyra stands out as the top performer in TVL growth this year, boasting an impressive 92.3% increase YTD to secure US$23.3M. **Conversely, Opyn has experienced a decline in market share, with a 40.3% decrease YTD**. Nonetheless, the protocol still maintains a significant position in this space, owing to the remarkable traction it gained in the early parts of 2022. **Notably, Aevo has exhibited remarkable growth since its launch, securing its place as the seventh-largest options protocol by TVL with US$4.9M**.

Figure 23: Lyra has grown 92.3% YTD to reach a TVL of US$23.3M, showcasing its growth in a developing options space
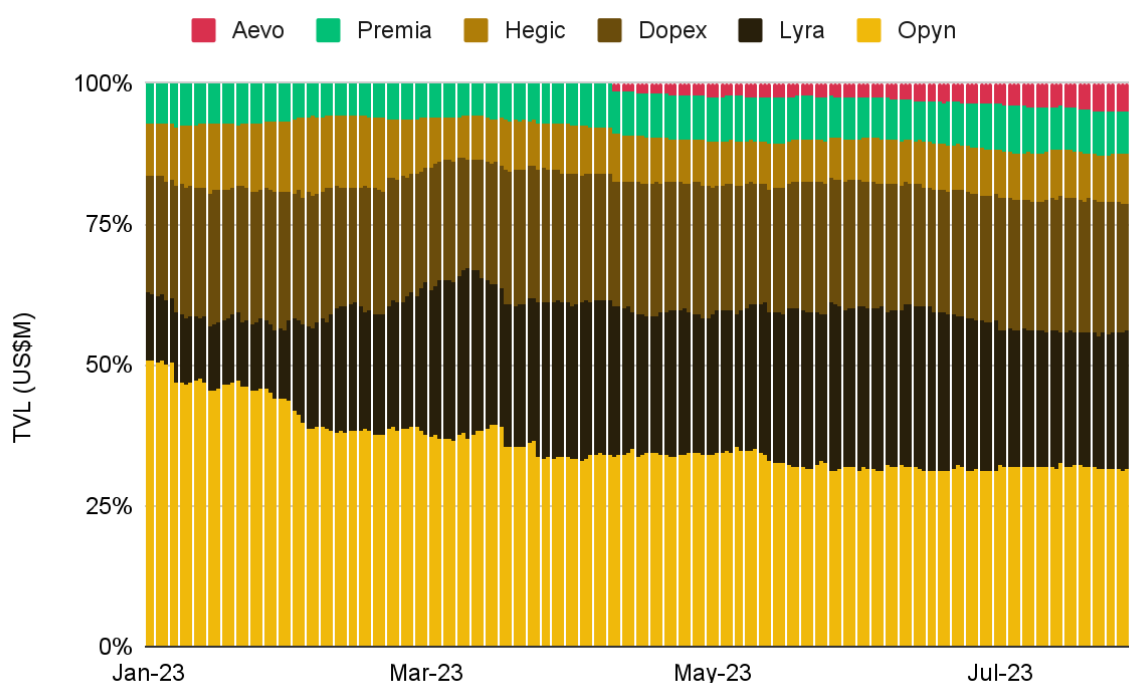
Source: DefiLlama, Binance Research, as of July 30, 2023

Indeed, the top three options protocols contribute over 50% in TVL to their market. This figure rises to 67.3% if you only consider the top two perpetual futures protocols. **This showcases that the current derivatives market is fairly consolidated amongst a few protocols, with many of the smaller players yet to attract the same levels of capital**. Interestingly, this trend is not dissimilar to other DeFi sectors such as liquid staking or lending; user preferences for DeFi products tend to be based on familiarity and trust, meaning that TVL is likely to consolidate within a few protocols in the long term. While this may create an invisible barrier, innovation is certainly one way to overcome this, as seen by the recent growth in some of the newly emerging derivatives protocols.

Prospects Ahead

Although DeFi derivatives exhibit numerous innovations, they remain nascent. **Their potential to rival CEXes is presently curtailed by limitations in liquidity and user experiences. Finding the equilibrium for the most effective model is key, especially as it impacts scalability and the economic incentives for LPs**. Nevertheless, considering the importance of derivatives for DeFi, this sector harbors immense opportunities for protocols capable of delivering sustainable solutions. Drawing from current market observations, the following areas may surface as potential catalysts for encouraging broader adoption:

◆ **Expanding types of collateral:** Expanding choices of collateral beyond stablecoins can improve flexibility and capital efficiency. This may entail the use of yield-generating assets, like AAVE's aUSDC over regular USDC or stETH in place of standard ETH, especially given their growing popularity.

◆ **Cross-margining:** Cross-margining provides traders with the ability to utilize open positions as collateral for additional ones. This can boost profits but also escalate risk, as one position's losses could cover another's margin. However, for some traders, the benefits of utilizing margins across various positions may outweigh the risks, enhancing the appeal of derivatives and improving capital efficiency.

◆ **Lower fees:** Protocols often face high fees due to the need to reward LPs, who take on both counterparty risk and potential impermanent loss, thereby burdening traders with maker and taker fees. Despite temporary mitigations like token rewards or rebates, enduring competitiveness with CEXes will require a rebalancing of this fee structure and a focus on sustainable, low-fee models.

◆ **Onboarding market makers:** In traditional markets, market makers establish structures to assure liquidity and influence key variables that drive efficient markets. While adopting a similar approach in DeFi may address certain limitations, the risk of arbitrage exploits persists. Therefore, the significance of a well-designed system and strong partnerships with market makers is paramount.

◆ **Increase trading tools:** Introducing new trading pairs, undercollateralized trading, and more complex order types not only enhances the user experience but also drives overall platform improvements. Its success, however, relies heavily on overcoming certain challenges, such as low liquidity and the availability of infrastructure.

7 Closing Thoughts

Currently experiencing an uptick in momentum, the derivatives sector is widely perceived as an essential component for DeFi to progress to its next phase. Despite this optimistic outlook, it's important to note that CEXes still significantly outperform DEXes in terms of volume. To compete effectively, DEXes must relentlessly innovate in infrastructure and UI/UX design for more familiar trading experiences. Despite existing challenges around liquidity and volume, the landscape is rapidly evolving thanks to continuous innovation in the sector. Key players in this progression are likely to be perpetual futures and options.

The perpetual futures space is reaching a critical juncture in its rivalry with CEXes. With both volume and development activity accelerating, several protocols are on the verge of groundbreaking advancements that could add significant value to their platforms. Meanwhile, options, whether CLOB- or AMM-based, are still striving to gain similar traction. Nevertheless, there's a clear focus on identifying the most effective model to manage the complexities of options, with concentrated liquidity pools emerging as a notable development.

Looking forward, the trajectory of these developments is uncertain, yet it is undeniable that there are exciting times ahead for the DeFi Derivatives market. As the sector matures, the expectation is a shift toward a more consolidated market structure.

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