DEXSCAPE: SCALING, INNOVATING, AGGREGATING

HELIX MARKETS   native   Velvet Capital

Cointelegraph Research Report

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DEXScape: Scaling, Innovating, Aggregating

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I. INTRODUCTION

DEXs are the crypto-native way to trade assets. They allow traders and liquidity providers to retain pseudonymity and eliminate the trust that needs to be placed in third parties. DEXs have undergone significant technological advancements over the past few years.

Developers have introduced innovations to tackle impermanent losses, high gas fees, security, and composability. However, as a market segment, DEXs did not seem to immediately benefit significantly from these developments and failed to recover after the Terra crash of 2021 (Figure 1):

Figure 1: Total Value Locked on DEXs since April, 2022

In this report, we identify technological developments paving the way for the future of DeFi, including the scalability of the blockchains DEXs are built upon, innovations in AMM mechanisms, and advancements in blockchain aggregator algorithms.

We also delve into the ways of tackling liquidity fragmentation, enhancing user experience, and more.

II. INNOVATIONS THAT HAVE SHAPED THE DEX MARKET

Greater Blockchain Scalability as a Necessity for DEX Growth

Traditionally, the success of a blockchain's ecosystem in DeFi is measured in terms of total value locked (TVL), i.e. the value of all assets accrued by various protocols. Ethereum's dominance in TVL has steadily been increasing from 64% on Jan. 1, 2023, to 70% on Feb. 19, 2024.[1]

However, data that tracks only DEXs and excludes other DeFi protocols paints a different picture.

Ethereum's dominance remained stagnant and changed from 53% in January 2023 to 49% in February 2024. However, many of its competitors have seen significant growth of their respective DEX dominance, including the two up-and-coming chains, Sui and Manta (Figure 2), that were launched in this cycle. Total aggregate TVL on DEXs grew within this period:

Figure 2: Changes in TVL on DEXs across major blockchains

Exchanges	TVL as of Jan. 1, 2023, USD, billions	TVL as of Feb. 19, 2024, USD, billions	Growth / %
Total	14.8	16.6	12%
Ethereum	7.88	8.08	3%
Tron	5.79	5.58	-4%
BSC	2.98	1.87	-37%
Arbitrum	0.31	0.85	174%
Solana	0.044	0.46	945%
Polygon	0.49	0.34	-31%
Bitcoin	0.035	0.065	86%
Optimism	0.2	0.23	15%
Sui	0	0.29	N/A
Manta	0	0.31	N/A

Source: DefiLlama

The impression that smaller chains are outpacing Ethereum's growth solidifies when looking at the performance of individual projects.

We analyzed the annual performance of DEXs, which had more than $1 million in TVL at the beginning of 2023.

[1] *DefiLlama*, as of Feb. 19, 2024

It was identified that merely 20% of decentralized exchanges that demonstrated 100%+ annual TVL growth were built on Ethereum layer-1 as their main chain (Figure 3).[2]

This suggests that more developers are moving toward other blockchains, as higher gas fees and longer transaction finality on Ethereum are significant limiting factors for the evolution of decentralized exchanges. However, the Dencun upgrade, introducing proto-danksharding, may significantly increase the popularity of Ethereum's layer-2 solutions.

Figure 3: Number of DEXs with over $1M TVL as of Jan.1, 2023 and over 100% annual TVL growth since then, sorted by layer-1(0) blockchains
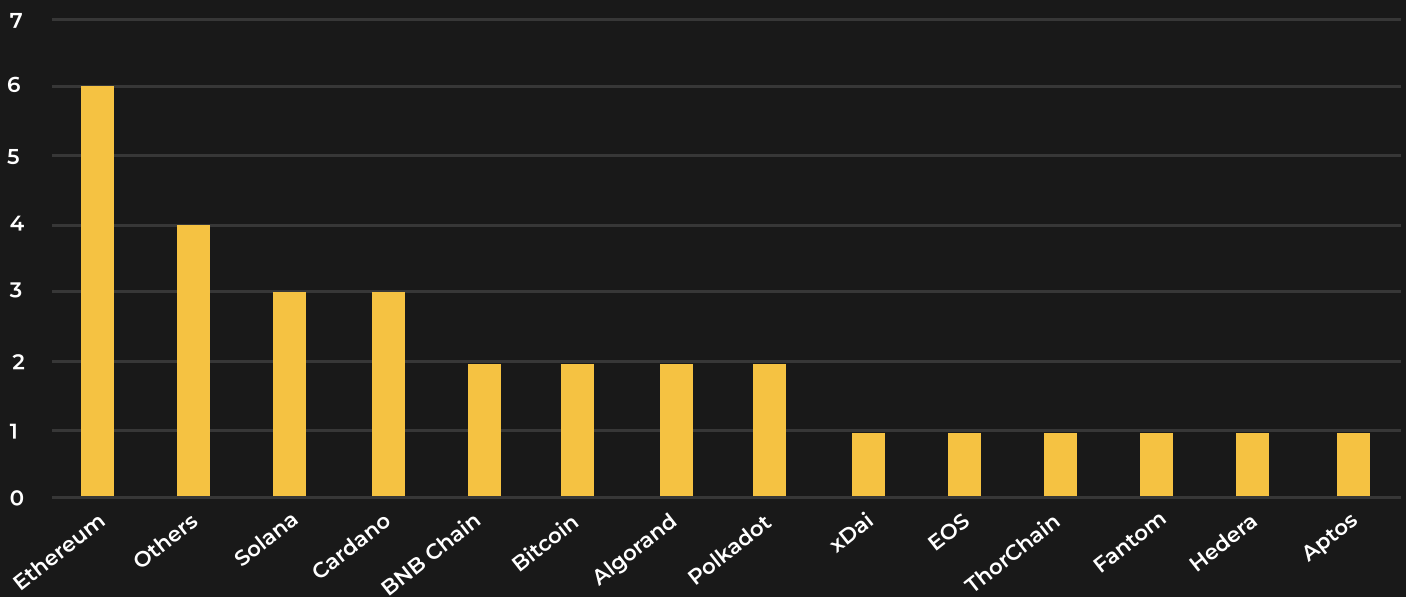
Source: Defillama, Cointelegraph Research (as of Feb. 14, 2023)

[2] Note: such a comparison may not necessarily be a sign of ecosystem growth but instead serve as a proxy of advanced projects' development on a particular blockchain
[3] Learn more about Dencun upgrade *here*

About Velvet Capital:

Velvet Capital is at the forefront of decentralized finance (DeFi), offering a state-of-the-art platform that enables users, including emerging fund managers and DeFi enthusiasts, to effortlessly create and on-chain funds, structured products, and tokenized portfolios. This initiative is backed by prominent investors, including Binance Labs (lead), Blockchain Founders Fund, Mucker Capital, MH Ventures, GateIO Labs, and others.

"Trillions of dollars worth of assets will be managed on-chain, and Velvet.Capital is building a professional-grade infrastructure to streamline this process. Its intent-based architecture ensures flexibility to access any asset & protocol, and account-abstraction features make it simple for both institutions and DeFi enthusiasts."
- Velvet.Capital Team

Ve(3,3) token and its role:

Velvet Capital has introduced an innovative component to its ecosystem with the upcoming launch of the ve(3,3) tokens. Its token mechanism is inspired by the broader DeFi movement, where tokenomics plays a crucial role in governance and utility.

The ve(3,3) token is set to power a "flywheel" effect, where increased participation in the Velvet ecosystem leads to greater utility and value for all involved. This could manifest in various ways, such as improved yield opportunities, enhanced governance features, or exclusive access to new products and services.

Ecosystem development and expansion:

Velvet Capital's recent achievements include the successful launch of its platform on the BNB Chain with the top TVL growth in November and reaching the #1 spot in its category.

The platform's expansion also includes deployments on Arbitrum, whose foundation provided Velvet.Capital a grant, as well as Ethereum, and other EVM-compatible blockchains in the pipeline.

Liquidity mining program:

Velvet Capital has unveiled an enticing liquidity mining program aimed at fostering early support and growth within its DeFi ecosystem. This program is particularly notable for offering double airdrop points for the first $5 million in TVL.

Such a strategic incentive is designed to attract and retain liquidity providers, thereby ensuring a robust and liquid market for Velvet Capital's diverse range of DeFi products and services.

[Website](#) [Twitter](#) [Telegram](#) [Discord](#)

Evolution of Blockchain-Based Market Makers

In 2017, Bancor introduced the first iteration of automated market makers, the constant product market maker. The protocol made waves in the DeFi space and managed to surpass a market cap of $290M and a 24-hour trading volume of $13.46M by Jan. 1, 2018.[4]

Things began to accelerate with the launch of Uniswap v2 in May 2020. It quickly established itself as the cornerstone of trading activity during DeFi summer, a period of explosive growth during which the sector was first widely popularized. The volumes on DEXs increased precipitously in this time period, from $1.71B in July 2020 to $234.98B by November 2021.[5]

Since then, hundreds of additional AMM designs have been released to iterate or build on Uniswap's basic idea. Uniswap v2 alone has been forked more than 550 times.[6]

Competition between decentralized exchanges has resulted in significant innovation in their governing mechanisms.

Some of the most popular mechanisms at the time of writing are presented below (Figure 4). However, multiple solutions incorporate several mechanisms simultaneously or do not strictly fit into these categories. For instance, while Xave belongs to a group of CSMMs, it can also be considered a dynamic AMM due to its use of Chainlink oracle to determine prices within a certain price range.[7] Simultaneously, dYdX v3, one of the largest perpetual DEXs, incorporated order book trading but stored it off-chain.[8]
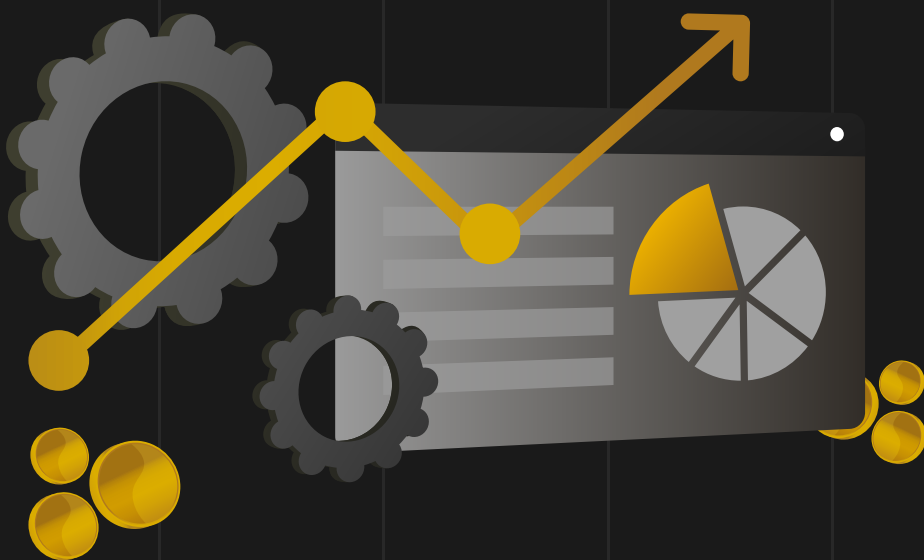
[4] *DefiLlama,* as of Feb. 22, 2024
[5] *DefiLlama,* as of Feb. 22, 2024
[6] *DefiLlama,* as of Feb. 22, 2024
[7] *Xave,* Feb. 26, 2024
[8] *dYdX*, Feb. 26, 2024

Figure 4: Mechanisms governing DEXs sorted by their emergence and complexity

Type	Mechanism	Use Case	Examples
Constant Product Market Maker	Uses the formula $x*y=k$. where x and y - denote the amounts of the two assets in the pool and k is a constant.	Trading of volatile asset pairs.	Uniswap v2 Pancakeswap
Constant Sum Market Maker	CSMMs hold the sum of the number of units of both assets constant, and thus $x+y=k$.	Trading of stablecoin pairs, such as USDT and USDC.	Bancor v1 Loopring v1
Constant Mean Market Maker	CMMMs use liquidity pools with three assets that satisfy the equation $(x*y*z)1/3=k$, i.e. hold the geometric mean of their quantities constant.	Maintaining variable exposure across various assets and swaps across any of the assets in the pool.	Bancor v2 Balancer v2
Other Constant Formula AMMs	CMMMs use liquidity pools with three assets that satisfy the equation $(x*y*z)1/3=k$, i.e. hold the geometric mean of their quantities constant.	Optimizing for slippage and achieving tighter price margins.	Curve v1
Concentrated liquidity AMM (CLAMM)	Liquidity providers can specify price ranges within which to provide liquidity	Greater capital efficiency, reduced slippage and impermanent loss mitigation	Uniswap v3 Sushiswap Kashi
Hybrid DEXs (HEX)	CFMM algorithm and order book trading operating simultaneously on the exchange.	Enabling efficient price discovery and conventional order book interface.	IDEX
Dynamic Automated Market Maker	Input from a market price oracle is used to modify the mathematical relationship between the assets so that the pool price is identical to the market price.	Preventing arbitrage opportunities, to benefit liquidity providers.	Bancor v3 (CPMM) Xave (CSMM)
Virtual Automated Market Makers	Instead of relying on a liquidity pool, traders deposit collateral to a smart contract. vAMMs utilize synthetic collateral and virtual mechanisms to recreate price movements of assets.	Allowing derivatives trading, minimize price impact, mitigating impermanent loss, and enabling single token exposure.	Perpetual Protocol
Active Liquidity Management (ALM)	Provides automatic management of price ranges, asset rebalancing, and reinvestment of earned fees.	LPs are allowed to earn without the need to manually rebalance their portfolios.	GAMMA TraderJoe v2
Proactive Market Maker (PMM)	Utilizes dynamic slippage and changes price curves and pool ratios. Leveraging oracles for price discovery, it proactively purchases extra tokens from external sources at above the market price to meet increased demand before price rises.	Achieving price stability by minimizing a potential price increase fueled by the abrupt rise in buying pressure.	Lofty DODO
On-chain Orderbook DEX	Function as a traditional order book but mitigate the risks of trusting a centralized exchange	Offering advanced trading order types such as stop-loss & trailing stop orders, while mitigating standard AMM risks.	Helix Markets Quickswap
Credit-based PMM	Allows credit-based trading by leveraging funds in the liquidity pool	Higher capital efficiency for market makers, yield potential for LPs, and efficient pricing for traders	Native Labs - Aqua

Source: Cointelegraph Research

HELIX
MARKETS

Helix: Your Crypto Command Center

Helix Markets is a DeFi trading platform that simplifies the complexities of cryptography, security, and interactions across different blockchains. It's designed to be user-friendly and offers a seamless trading experience with minimal friction. Unlike current DeFi solutions, Helix Markets eliminates hidden trading costs, impermanent loss, endless bridging of chains and layers of scaling solutions.

For DeFi to reach its first billion users, Helix Markets offers these key features:
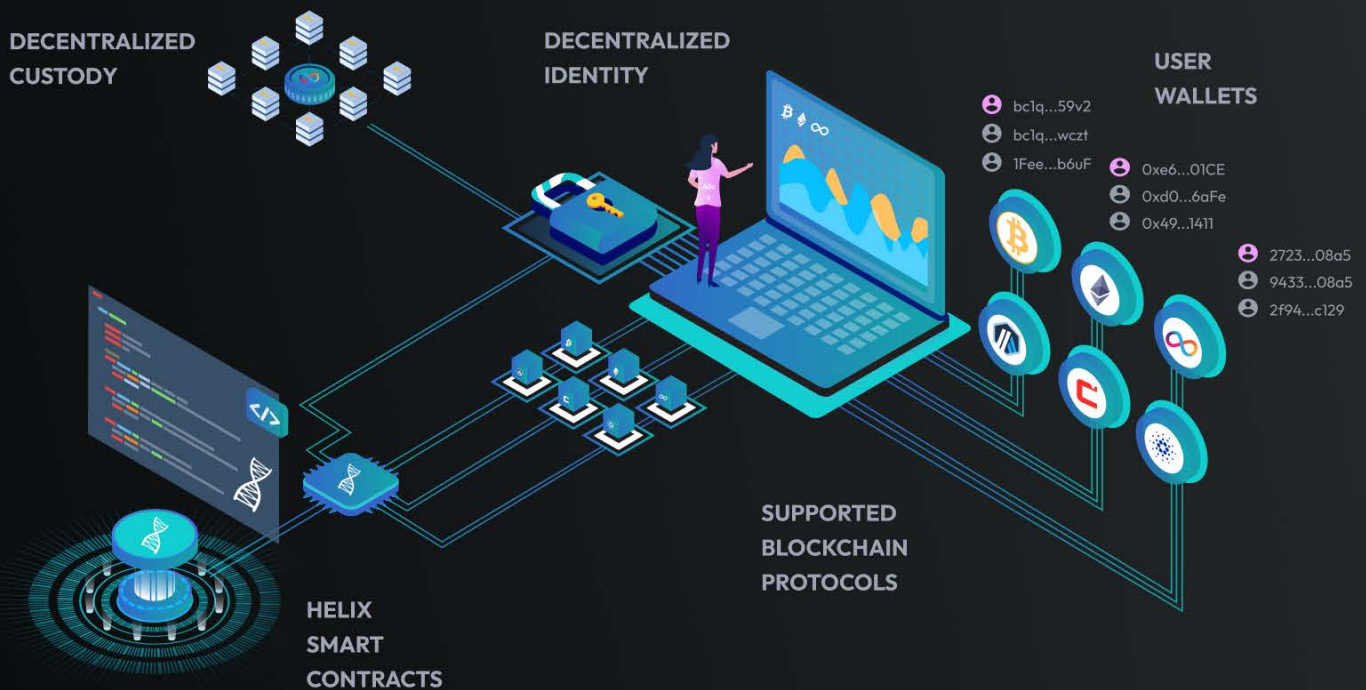
On mobile and desktop

Our user-friendly trading app allows you to trade on the go or from your desktop. Helix Markets adapts to your trading style, keeping you updated in real time.

Supercharge your liquidity

Source the best liquidity on the most active chain. Instantly swap between any tokens without bridging or wrapping. Directly access the orderbooks through the websocket API to enable high-speed algo-trading

Trade on any blockchain

Why limit yourself to any one chain or learn the intricacies of each chain - Helix handles all this so you don't

DECENTRALIZED CUSTODY

DECENTRALIZED IDENTITY

USER WALLETS

bc1q...59v2
bc1q...wczt
1Fee...b6uF

0xe6...01CE
0xd0...6aFe
0x49...1411

2723...08a5
9433...08a5
2f94...c129

HELIX SMART CONTRACTS

SUPPORTED BLOCKCHAIN PROTOCOLS

Whether you are a shrimp, shark or whale,
Helix Markets takes your trading to the next level.

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We can draw some inferences about the success of innovative market maker mechanisms by calculating the liquidity turnover ratio of exchanges that use them, i.e. their trading volume divided by TVL. This ratio gives a measure of capital efficiency and is an important indicator of success when evaluating the performance of an exchange (Figure 5).

Figure 5: Turnover of well-known DEXs on Ethereum and their respective mechanisms

Exchanges	Mechanism	TVL / USD, millions	Trading Volume / USD, millions	Turnover
DODO	PMM	21.46	63.90	298%
Perpetual Protocol	VAMM	8.76	19.09	218%
Uniswap v3	CLAMM	2,493	996.8	40.0%
Uniswap v2	CPMM	2,108	170.9	8.11%
Balancer v2	CMMM	1,188	93.20	7.84%
Curve Finance	CSMM	2,071	113.0	5.46%
Trader Joe v2	ALM	1.53	0.06	3.81%
Bancor v3	DAMM	60.95	0.72	1.18%
IDEX	HDEX	73.17	0.03	0.03%

We did not find many examples of hybrid exchanges on Ethereum with a high level of adoption. However, as shown in the above table, proactive and virtual automated market makers exhibited significantly higher turnovers than other AMMs. Concentrated liquidity AMMs, including Uniswap v3, also display consistently high turnover figures.

The lack of trading activity on Bancor, listed as a DAMM in Figure 5, can partially be attributed to the lack of confidence from crypto veterans. The protocol experienced an exploit which resulted in a $500,000 loss in 2020 and a subsequent class-action lawsuit over impermanent loss protection promises in 2023. No DAMMs of similar size seemed to have appeared since then.

Furthermore, although decentralized order book exchanges are not present at all on Ethereum, we found that Helix Markets, based on Injective protocol, exhibited a turnover of almost 1,000%. We strongly believe that their higher turnover could lead to the adoption of decentralized order books in the near future.

This trend could possibly be accelerated by Ethereum's Dencun upgrade, as well as a general increase in the scalability of the blockchains. An order book's state is significantly more complex than that of a liquidity pool and thus requires more frequent access to storage, resulting in expensive OP-codes. Thus, blockchains would need to be able to process and record more data with high frequency to effectively accommodate order book DEXs, a feature not yet available on the majority of networks.

[9] *Defillama,* as of Feb. 26, 2024   10 *Cointelegraph*, May 16, 2023

Rollups — Enhancing DEX Performance

Optimistic rollups and zk-rollups have long been discussed as one of the most promising ways to scale Ethereum while ensuring nearly uncompromised security. Both types of roll-ups are currently used to build high-throughput layer-2 solutions, although their underlying mechanisms differ.

zk-rollups validate transactions through zero-knowledge proofs and publish proofs of validity on-chain to ensure quick transaction finality.[11] Optimistic rollups, on the other hand, assume that all new commitments to the chain are valid and rely on a fraud-proving scheme to disincentivize falsified commitments. Users can compute a fraud-proof during a challenge period, a specific time window after the rollup batch is submitted on-chain. Submission of a fraud proof, in turn, leads to the re-execution of transactions and an update in the rollup's state.[12] Subsequently, the responsible

sequencer will have their stake slashed.

Multiple DeFi platforms have already started building on rollup blockchains. However, optimistic rollups seem to dominate the market, with Arbitrum and Optimism having a combined 60% TVL dominance among rollups.[13]

This is likely because zk-based Layer 2s are more novel. Yet, as the adoption of the technology rises, we may see the balance shift towards dApps built on zk-rollups, which can offer shorter times to finality and potentially lower fees. [14, 15]

Some zkEVM blockchains have already exhibited significant growth. In particular, the Manta network achieved almost $600 million in TVL, equivalent to 10% dominance across the rollups market. [16] Simultaneously, Polygon's zkEVM already shows high degree of adoption among DEXs as QuickSwap and other platforms try to reduce transaction costs.

Figure 6: Investment Trends in Optimistic and zk-rollup DEXs vs. Others since 2023
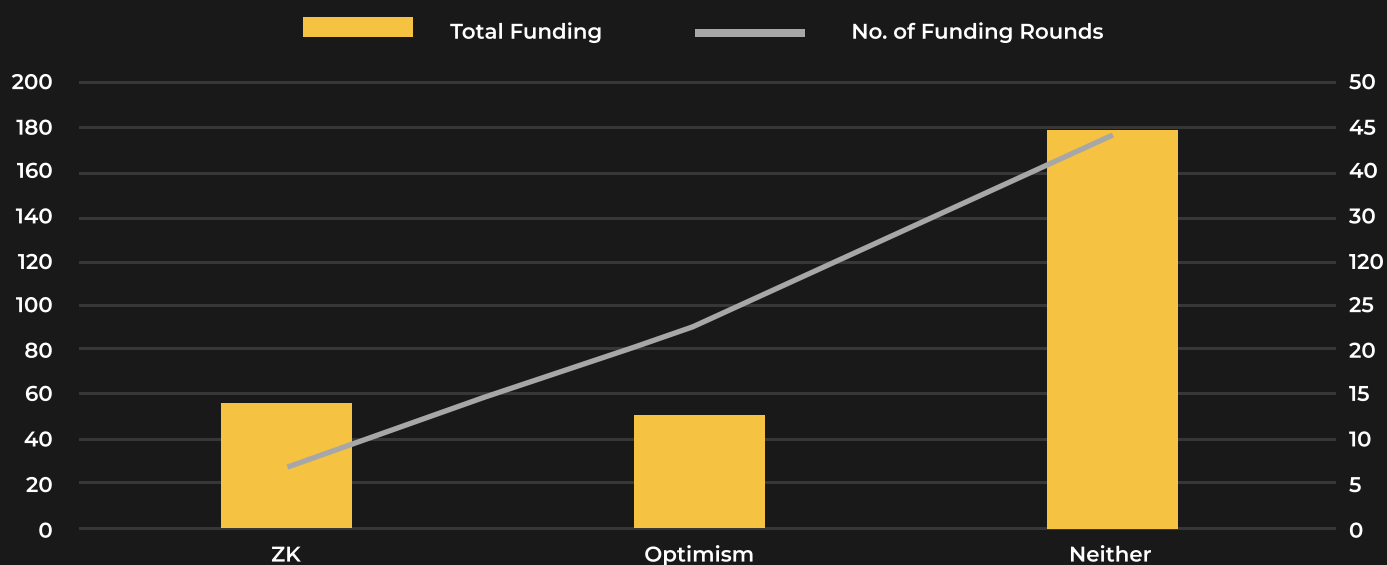
[11] *Ethereum,* as of Feb.27, 2024
[12] *Ethereum,* as of Feb. 27, 2024
[13] *Defillama,* as of Feb. 26, 2024
[14] *CoinMarketCap,* Feb. 27, 2024
[15] *Mina Protocol,* Feb. 27, 2024
[16] *DefiLlama,* as of Feb. 27, 2024

Interestingly, despite a significantly lower number of funding rounds, DEXs building on zk-rollups received more funding since the beginning of 2023, with an average funding round of $7.5 million. However, 'outside-of-rollup' solutions have received over 60% of total DEX funding since the beginning of 2023 (Figure 6).[17]

Thus, despite the vast potential of the rollup solutions in the future, the ecosystems of layer-1 blockchains such as Solana are still deemed competitive by venture capitalists.

One might question the feasibility of integrating decentralized on-chain order books with roll-ups. At the time of writing, we failed to identify any order-book-based DEXs that are deployed on optimistic rollups.

The most likely reason is that while reducing the demands for the execution of contracts, optimistic rollups cannot significantly compress individual transaction records (which need to be submitted as calldata)[18] or reduce the demand on storage that is persistent across commitments to the main chain. However, the Dencun upgrade may resolve this issue.

Developers of decentralized order books on zk-rollup solutions, on the other hand, have made substantial progress. Since zk-based solutions only send a proof of validity and not the whole state on-chain, the calldata limit per block issue is mitigated. For example, tanX (previously Brine) is currently developing a solution that utilizes zk-STARK proofs to allow such functionality (Figure 7).

Figure 7: An example of zk-STARKs used in decentralized orderbook exchange
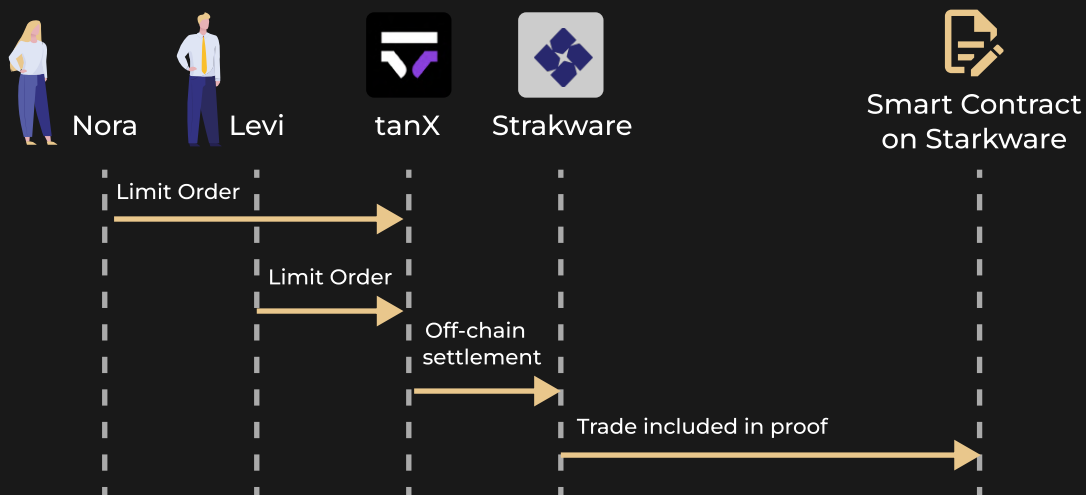
Source: TanX

Moreover, another advantage of zk-based decentralized exchanges is their ability to prevent frontrunning, as privacy is guaranteed by the implementation of ZKPs. In particular, since individual transactions are batched, on-chain validators decrypt only a batch of transactions, i.e. total difference of all accounts between time instances. Individual transactions, however, remain private.

[17] *Cointelegraph Research,* as of Feb. 27, 2024
[18] *Github,* as of Feb. 27, 2024

QUICKSWAP DEX

Overview:

QuickSwap leads as the top DEX and AMM on platforms like Polygon, Polygon zkEVM, Manta Pacific, Dogechain, Immutable zkEVM (testnet), X1 Network (testnet), and Astar zkEVM (testnet). It allows for activities such as swapping, providing liquidity, farming, staking, and engaging in perpetual swaps, all at high speeds and with minimal transaction costs.

Central to QuickSwap is the DragonFi ecosystem, which strives to deliver an extensive array of products and services that go beyond conventional DeFi. This expansion includes a decentralized perpetual exchange and a gaming hub to enhance the overall user experience on the platform.

QuickSwap's mission is deeply rooted in a commitment to nurturing and expanding the global crypto community. The platform is dedicated to collaborating with widest possible range of entities and individuals, providing an inclusive environment where everyone has a voice, regardless of size or possible competitor status. By focusing on removing barriers to entry and fostering widespread crypto adoption, QuickSwap aims to create a more equitable and accessible ecosystem.

Polygon 2.0:

During the past summer, Polygon introduced its grand plan, Polygon 2.0, envisioning a future where it evolves into a vast ecosystem of Layer 2 rollups. These L2 rollups are powered by zero-knowledge technology and will function seamlessly and interoperably, providing projects with a versatile development environment using Polygon's Chain Developer Kit (CDK), while offering users the simplified experience of navigating an entire universe of Polygon chains with unlimited scalability and unified liquidity.

DragonFi 2.0:

However, QuickSwap has its own bright vision to boost growth and advance its position as the leading DEX and dominant DeFi force in Polygon 2.0:

QuickSwap has been at the forefront of the DeFi landscape revolution, pioneering the integration of Polygon technologies since the inception of the Matic Network. Marking a historic milestone, QuickSwap became the first DeFi protocol to achieve $1 billion in daily volume, cementing its leadership position during the exhilarating Polygon summer of 2020.

However, QuickSwap didn't stop there. Continuously setting the pace, it has ventured into new territories within the Polygon ecosystem, launching its insnovative DeFi platform across various chains. This strategic expansion has not only fueled early-stage growth but has also played a crucial role in knitting together stronger, more vibrant communities. QuickSwap's dedication and commitment to the community is expressed in hosting regular All Roads Lead to Polygon events where everyone's voice matters.

With a relentless drive for mainstream crypto adoption, QuickSwap provides equal platform for the whole crypto community, embracing even its competitors in a shared journey towards a decentralized future.

DragonFi 2.0 is QuickSwap's most recent initiative, setting the groundwork for its aim to dominate the Polygon CDK landscape and become an even greater force on Polygon. As QuickSwap expands to more Polygon EVM chains, it will be increasingly focused on QuickSwap Citadels – unique, integrated, and connected deployments that will serve as fortresses on new chains determined to add value to Polygon 2.0. Imagine a world where QuickSwap Citadels dominate the DeFi landscape on an infinite number of Polygon chains - a cohesive piece of interoperable & composable infrastructure as well as the community hub for all of Polygon through Polygon CDK

Figure 8: Explanation of how privacy of individual transactions is guaranteed by zk-rollups
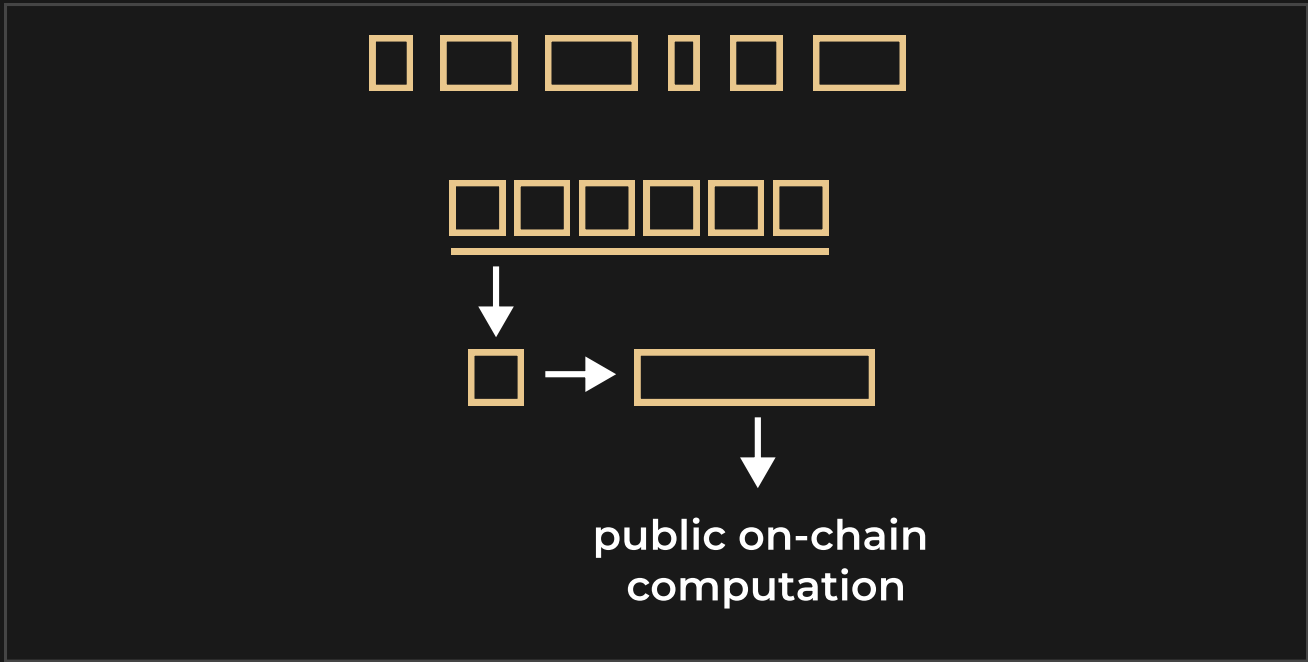
Source: Devcon

Bitcoin DEXs and their Scaling Solutions

Bitcoin DeFi has seen a significant resurgence as a number of sidechains / layer-2s have launched their mainnets over the last few years and are offering next-generation EVM compatibility and programmability utilizing smart contracts.

Through the merge-mining and proof of transfer consensus mechanisms, Bitcoin-secured scaling solutions have become

notable competitors for Ethereum and alt chains in the DeFi space.

In this report, we will focus on the Stacks and Rootstock (RSK), which dominate Bitcoin sidechains / layer-2s in terms of TVL, with a dominance of more than 90%.[19] However, the two protocols are vastly different from a technical perspective (Figure 9):

Figure 9: Comparison of RSK and Stacks Protocol

Feature	RSK	Stacks
Launched	2018	Initially in 2017, re-launched in 2021
Pre-mined	No	Yes
Native Token	RBTC (two-way pegged Bitcoin)	Stacks (STX), sBTC
Consensus	Merge-mining + DECOR	Proof-of-Transfer (PoX)
Compatibility	Ethereum (EVM)	Supports various VMs through subnets
Average Block Interval	30 seconds	10 minutes

*Source: Medium*

19 *Defillama,* as of Feb. 29, 2024

In addition, the solutions target slightly different use cases. RSK focuses on preserving BTC as the native asset of the sidechain while adding more expressive smart contract capabilities. Stacks, on the other hand, leverages Bitcoin for its security, but creates a largely independent layer-2 solution with STX as the native asset.[20]

RSK's leading platform is Sovryn, a vertically integrated application that connects Bitcoin with other blockchains through a complete set of DeFi functionalities, from lending and stablecoin development to trading and swapping.

With a total set of 13 assets, the exchange allows AMM swaps, as well as decentralized order book spot and derivatives trading. At the time of writing, Sovryn achieved almost $2 billion in trading volume. Yet, the TVL of the DEX is a mere $34 million, less than 50% of Alex, the largest DEX on Stacks.[21]

Moreover, it should be noted that Stacks has been increasing its dominance over Rootstocks since 2023, eventually becoming the largest scaling solution on Bitcoin in 2024 (Figure 10):

Figure 10: Dominance of Bitcoin Scaling Solutions in Terms of TVL
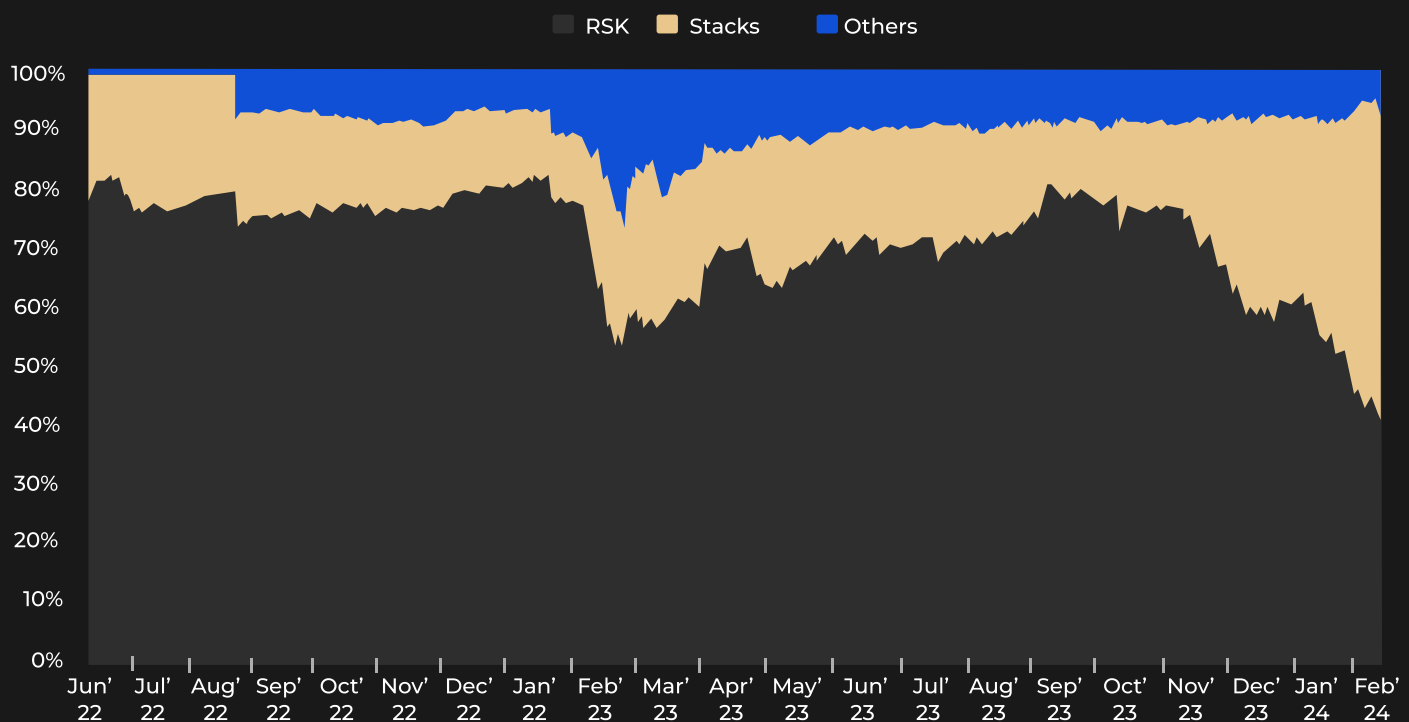
In the case of Alex DEX, a potential reason behind market dominance may be the greater variety of tokens available on Alex DEX (44 trading pairs, including PEPE, ORDI, and more), IDO/launchpad availability, and initiatives supporting Stacks-based projects.[22] Yet, both Alex DEX and Sovryn combined only have an approximate $100 million in TVL, suggesting that they are still early stage projects.

Significant venture capital inflows into Bitcoin based DeFi could be observed recently, suggesting that breakthroughs in the Bitcoin DeFi space may be on the horizon in the next few years. Some of the most notable examples include Velar, which wants to become the first perpetual DEX on Bitcoin and recently closed a $3.5 million funding round, as well as Bitfinity, a novel EVM-compatible layer-2 solution on Bitcoin, which gathered $7 million in funding and plans to offer DEX and AMM functionality.[23]

[20] *Rootstock, Stacks,* as of Feb. 29, 2024
[21] *Sovryn,* Feb. 29, 2024
[22] *Alex DEX,* Feb. 29, 2024
[23] Cointelegraph Research, 2024

DEX Aggregators — Fighting Fragmented Liquidity

As various mechanisms were devised to address the issues of slippage and impermanent loss, one problem remained persistent as a challenge to the native ecosystems of DEXs: fragmented liquidity.

1Inch pioneered in 2018 as the first DEX aggregator to launch and address fragmented liquidity. It attempted to bring together various liquidity sources by utilizing a pathfinder and aggregator algorithm, which gave DeFi users the ability to use smart order routing:Their algorithm collected data from a predefined list of DEXs using APIs, to allow for better order execution prices and minimal slippage.[24] Importantly, the trustless nature of blockchain transactions remained uncompromised.

Ratio of order size to the size of liquidity pool, token price across DEXs, and gas fees are all taken into account by contemporary aggregators algorithms analogous to the first one created by 1Inch. This ensures that the trade is least detrimentally affected by various forms of slippage and different exchange rates across liquidity pools and DEXs (Figure 11).[26]

Figure 11: Effect of the aggregator use on a resulting price curve for trade execution
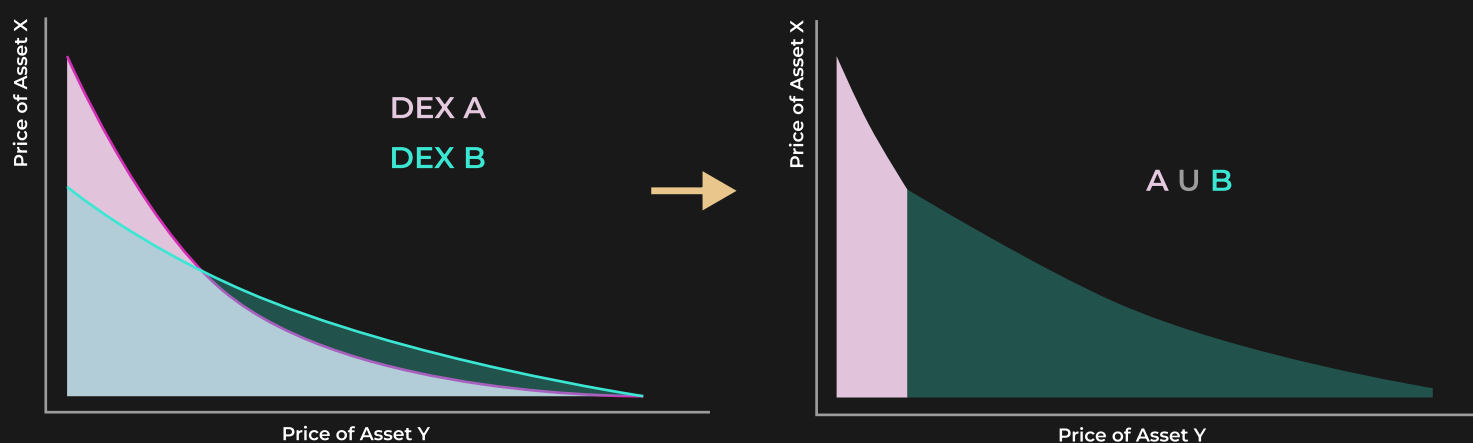
After the optimum route across exchanges is identified, a user's order is executed as a single atomic transaction across multiple exchanges. Various exchanges utilize such mechanisms as multi-hops, multi-leg, and multiple split-routing within the same transaction.

[24] *1Inch*, Feb. 29, 2024
[25] Ende et al., *A Methodology to Assess the Benefits of Smart Order Routing*
[26] *0xProtocol*, March 2024

DEX aggregators can source from tens of thousands of liquidity pools, aggregating their relevant data and the chain-associated fee data. Routing is thus a computationally challenging problem and algorithms may have to handle 20-160 hops in a single transaction and up to 8 splits per trade.

Such configurations also have high chances to identify paths that can reward a swapper with a trade surplus.[27] This complexity creates a use case for the application of various AI technologies to DEX aggregators.

An example of this is IcecreamSwap, whose vectorized off chain calculations enable the use of more sophisticated graph algorithms like a customized Bellman-Ford algorithm. The application of this algorithm means the router does not have to restrict the number of liquidity pairs, hops or splits involved in the trade.[28]
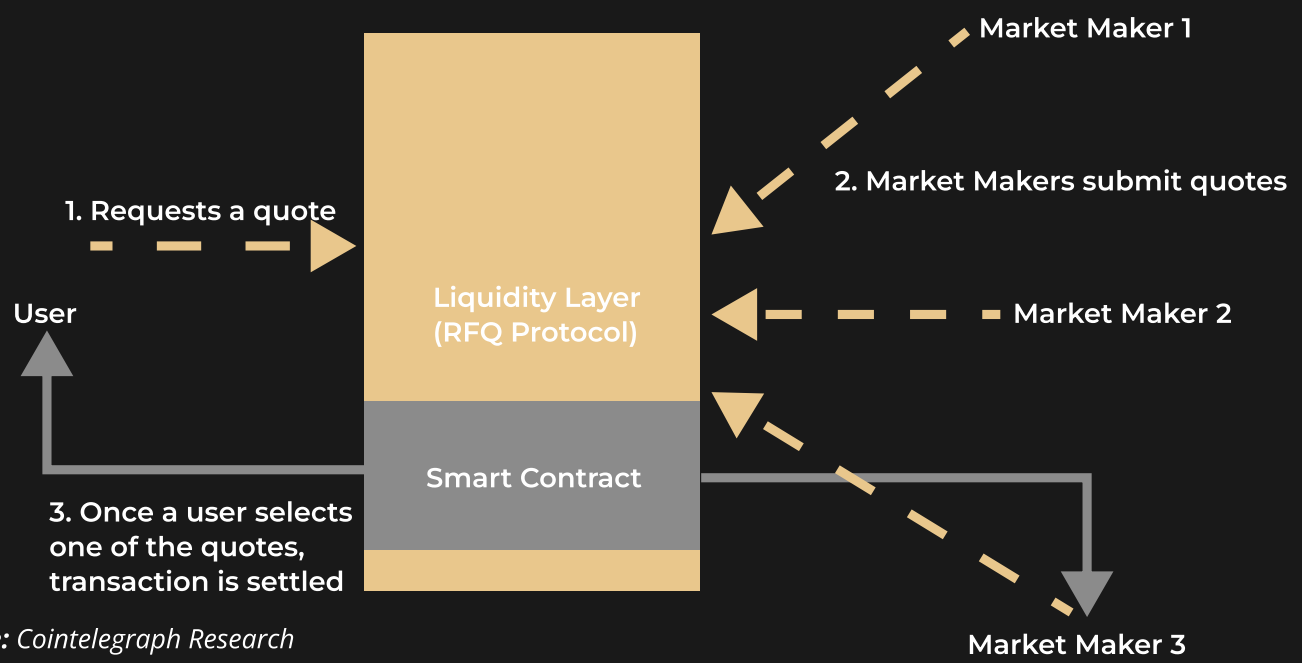
Another feature introduced by aggregators is a Request-for-Quote, which moves the liquidity provision requests off-chain, guaranteeing private negotiation of the trade while ensuring on-chain execution (Figure 12).

Thus, the risk of front-running by MEV bots is mitigated. Moreover, liquidity can also be sourced from private market makers (PMMs) such as centralized exchanges. Hence, a trader has greater chances to execute a transaction at a better price, while market makers unlock more trading volumes.

Figure 12: A schematic of how RFQ Protocol Operates

1. Requests a quote

User

Liquidity Layer (RFQ Protocol)

Market Maker 1

2. Market Makers submit quotes

Market Maker 2

Smart Contract

3. Once a user selects one of the quotes, transaction is settled

Market Maker 3

Source: Cointelegraph Research

[27] *IceCreamSwap,* March, 2024
[28] Cointelgraph Research, IceCreamSwap, 2024

Programmable Liquidity on All Networks:

Step into the future of DeFi with Native's new product Aqua, where capital efficiency meets maximum yield. Aqua is Native's revolutionary liquidity hub designed to unite these two critical aspects of decentralized finance, providing a platform for market makers, liquidity providers, and retail traders alike.

Aqua allows Market Makers (MMs) and Solvers to engage in credit-based trading by leveraging liquidity deposited by retail investors into a liquidity pool. This innovative approach enables Market Makers to offer more diverse pricing strategies, which in turn boosts capital efficiency and maximizes returns with leverage.

How Credit-Based PMM works?

For Market Makers: A Leap in Efficiency and Profitability

With Aqua's innovative credit-based trading, Market Makers can easily switch between CeFi and DeFi, allowing quick adaptation and efficiency in their market-making activities. Aqua provides a chain-agnostic credit system to increase efficiency and streamline operations drastically. By focusing more on strategy rather than being bogged down by immediate liquidity, Aqua opens up avenues for greater profits and flexibility.

For Liquidity Providers: Sustainable High Yields

Liquidity Providers will maximize their yields by depositing funds with Aqua. Aqua will have incredible yield opportunities powered by market-maker financing fees. Unlike fleeting yield opportunities on other platforms, Aqua provides a sustainable profit-sharing model, ensuring that your earnings are not just substantial but also lasting.

For Retail Traders: The Gateway to Optimal Pricing

Retail Traders will have access to competitive pricing on a wide range of assets through Native's advanced Request for Quote (RFQ) model and other DEX aggregators. Aqua's credit-based system ensures market makers can offer the best prices, making trades more profitable.

Aqua seamlessly integrates traders, liquidity, and credit into a unified system, depicted in the flow chart, thereby fostering efficiency and profitability within the DeFi landscape.
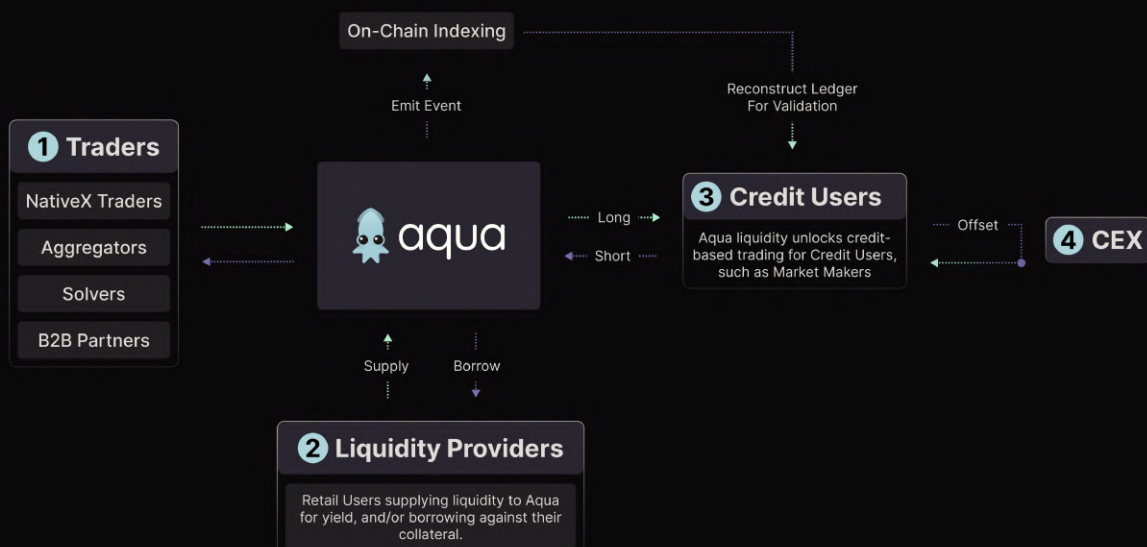
The evolution of meta aggregators and liquidity layers such as Native can resolve the liquidity fragmentation issue across chains, leading to cost-efficient and smooth cross-chain transactions even between less popular chains.

DEX aggregators can enhance a user's experience significantly, as the manual process of going through swaps on each chain and bridging is handled in a single and quick transaction (Figure 13).

Figure 13: An example of Native meta aggregator facilitating a cross-chain transaction
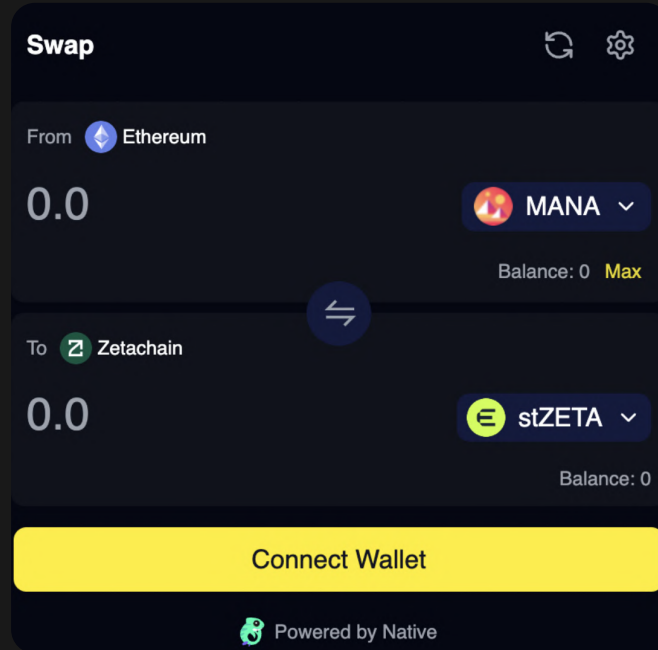

Source: Native Labs

These developments across DEX aggregators have resulted in a substantial increase in trading volume dominance across the broader DEX market rises (Figure 14).

Jupiter DEX on Solana has recently set a precedent in the industry, having reached the record number of over 260K unique active wallets UAW interacting with the aggregator.

Figure 14: Trading volume dominance of DEX aggregators compared to DEXs
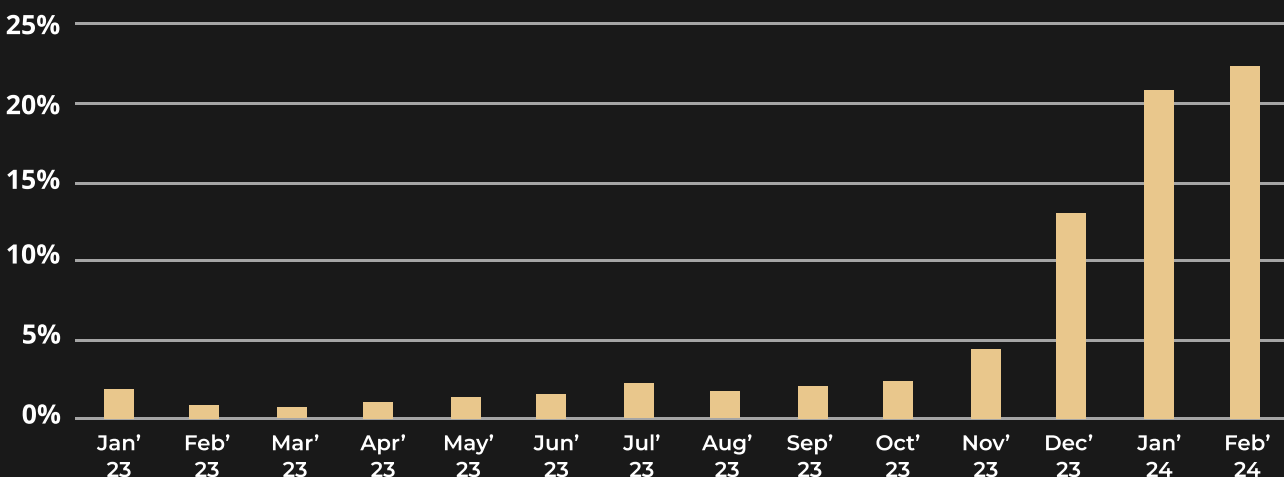
Source: Cointelegraph Research, DefiLlama

[29] DappRadar, as of Mar. 5, 2024

III. CONCLUSION

In this report, we identified several of the key recent developments in the decentralized exchange industry. We project that DEX volume on layer-2 EVM-compatible solutions will rise and take market share from L1s, especially due to lower transaction fees after Ethereum's Dencun upgrade. Despite this, the data for alternative L1 chains, including Solana, Arbitrum, and others, displayed surprising market performance in the last year.

On the other hand, the importance of a DEX's operating mechanism was signified, as some of the most popular proactive market makers, virtually automated market makers and more conventional concentrated liquidity AMMs present exceptionally high turnover figures of 40-300%. Nevertheless, the development of on-chain decentralized order book exchanges may start yet another revolution in the field.

The development of decentralized order book exchanges on optimistic and zk-rollups may radically change the industry as more investment flows into these solutions. Moreover, while the feasibility of these on optimistic roll-ups is uncertain, zk-STARK proofs have already been utilized to create these.

While Bitcoin DeFi is still in its infancy stage, promising Stacks and RSK solutions may also serve as a basis for the new DEX narrative. However, Stacks is already leading the Bitcoin sidechain/layer-2 DEXs market.

Lastly, DEX aggregators are expected to grow their dominance due to the ever-increasing need to fight liquidity fragmentation issues. Likely, the onset of more optimized smart routing protocols and the evolution of omnichain meta aggregators would enhance solutions' popularity across wider DEX markets.

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