Quarterly State of the Market 3Q’22

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Introduction

Entering the last quarter of 2022, Crypto is balanced on the precipice of uncertainty. A combination of macroeconomic issues, global regulatory uncertainty, and unfriendly markets make the coming quarter all the more impactful for the digital token economy.

Rising interest rates in the United States raise the opportunity cost of digitizing funds at a time where on-chain activity and yield is lower than it’s been in years. A rising Dollar Index places the Fed in the difficult position of balancing domestic inflation, and piling additional pain on countries attempting to sustain Yield Curve Control amid skyrocketing Energy costs.

Many crypto startups raised last cycle in tokens, the majority of which have fallen 95%+ in price, dramatically shortening their expected runway. For those that allocated more conservatively, fundraising hasn’t necessarily gotten friendlier. While there is still plenty of capital waiting to deploy in the space, rising rates mean private market valuations aren’t quite as friendly as they were a year ago.

While fundamentals have changed, projects and ecosystems will continue to build, each attempting to create efficiency through variations of the same core goal. In these environments, circling the wagons and understanding the core drivers of success for blockchains is more important than ever.

For our first ever Quarterly Report, we broke down the core theses for six ecosystems: Bitcoin, Ethereum, Avalanche, Solana, Polygon, and Arbitrum. From there, we looked at the raw numbers to see how effectively that thesis was realized over the last quarter, as well as what the outlook is moving through the end of the year.
Bitcoin Overview

BASE STATS

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<tr>
<th>Market Capitalization</th>
<th>$192bn (+9.0% q/q)</th>
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<tr>
<td>Nakamoto Coefficient</td>
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As the crypto industry matured, narratives always grew and developed around Bitcoin first and foremost, determining the direction of the digital economy. However, as the effects of mass liquidations and industry-wide contagion faded into semi-distant memory, momentum around Ethereum’s transition to Proof of Stake grew. Suddenly, it was Ethereum’s bid carrying the market, with Bitcoin lagging behind.

This isn’t the only uncharted territory for Bitcoin- historically, the asset hasn’t been closely correlated with markets, but growth into the mainstream has changed that. The global macro environment has been the key driver of price as of late, with Bitcoin showing a strong relationship to the performance of the dollar and (bearish) traditional markets.

That said, there remain a number of fundamental Bitcoin-specific factors that make the argument for Bitcoin as unique a Store-of-Value stronger than ever. With Fiat everywhere in flux, and Bitcoin down heavily from all-time-highs, expect investor focus on these metrics to increase.
Digital assets like Bitcoin historically have shown little to no relationship to traditional markets. Over the past quarter we've seen unprecedented levels of correlation to the Nasdaq and S&P 500.

Despite meaningful underlying inflation-hedging characteristics, Bitcoin is now thrown in the bucket of “risk” assets. As investor appetite sways between risk on and risk off, so does overall interest in Bitcoin. Throughout the past few months we've seen Bitcoin's correlation with the S&P 500 hit a high of 0.49, the highest it's been over the last two years.
Continued Dollar Strength

The Dollar Currency Index (DXY) measures the value of the US Dollar against a basket of major currencies. Foreign interest rate policies have remained accommodating, amid energy uncertainty, while the Fed remains hiking and hawkish. Fundamentally, without a CBDC, investing in digital assets is a bet on lower rates. As interest rates rise, the relative value of dollars as a yield generating store-of-value increases relative to both stablecoins (on-chain dollars that don’t capture rising Fed rates) and tokens (BTC & ETH).
Max Price Drawdown

At its low this quarter, Bitcoin was down almost 72% from highs.

Post-2015, Bitcoin's largest drawdowns have been -85% (1Q'15), -83% (4Q'18), and -82% (1Q'19). While that framework paints a compelling picture for risk/reward, the reality is much more complex. Unlike prior cycles, this drawdown is accompanied by a significantly less accommodative rates environment. In tandem, increasing correlation with bleak equities markets creates additional downward pressure on Bitcoin.
Bitcoin Dominance is an indicator that measures Bitcoin’s overall share of the total crypto market cap. This provides useful color on how bullish investors are on Altcoins, relative to Bitcoin as a ~1-Beta asset for the space.

Bitcoin dominance has approached historic lows, as Ethereum’s merge was a major catalyst for investors to overweight spot Ether in Q3 portfolios. Following the merge, Bitcoin dominance bounced slightly, but continues to reflect increasing investor appetite for non-BTC digital assets.
Market dominance and price aside, the robustness of the Bitcoin network is better than ever, as hashrate continues to hit all time highs. Hashrate represents the overall computing power devoted to the Bitcoin network; the higher the hashrate, the more resistant Bitcoin.

In the last month alone, hashrate has risen by 50%. While Bitcoin’s price and hashrate have no direct correlation, rising hashrates put margin pressure on miners. Rising mining difficulty means that a greater proportion of every Bitcoin earned must go to cover costs (sold), instead of potentially pocketed.
Bitcoin as a Store of Value

For Bitcoin to buck the trend amid a difficult macro environment it will need to lean into and reinforce its role as the de-facto digital store of value. Despite meager yield in DeFi, Bitcoin dominance is close to all time lows. Bitcoin has even lost share relative to its ‘outdated’ counterpart, gold.

While the underlying data isn’t what cryptoasset believers would’ve hoped to see, Bitcoin has a remaining important differentiators that could affect dominance over the coming months. Relative to Ethereum (and other Proof-of-Stake blockchains, broadly) it has a potentially meaningfully different regulatory status, which could remove US-based headwinds for investing. Combine that with global fiat volatility and low rates outside of the United States, and investor appetite for stable stores of value could be higher than expected.
Ethereum Overview

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<td>NFT Volume</td>
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<td>Nakamoto Coefficient</td>
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<tr>
<td>Average Daily Trading Volume</td>
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<td>-23.5% q/q</td>
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Ethereum’s narrative over the last quarter was entirely dominated by the merge. On September 15th, Ethereum abandoned Proof of Work, and took a major step toward becoming a ‘full’ Proof of Stake chain. After clearing that overhang, narratives around Ethereum have shifted toward sustainable on-chain yield (or lack thereof), centralization vectors, and staking.

Unlike Bitcoin, Ethereum’s market cap dominance is trending near all-time highs. Post merge, the differences between the two ecosystems have never felt more pronounced. Bitcoin is the status-quo digital store of value, focused on decentralization, security, and maintaining ethos above all else. Ethereum is the status-quo representation for the smart-contract digital economy of NFTs, DeFi, and Gaming.
Q3 / The Rise of Liquid Staking

Liquid staking was one of the most popular themes for Ethereum last quarter, with both Centralized and Decentralized options growing balances significantly. As the blockchain continues along the path to full Proof-of-Stake (PoS), liquid staking platforms offer investors the ability to easily stake, unstake, and trade staked Ether, without having to deal with lockups.

While the merge officially transitioned Ethereum to PoS, the ability for validators to officially unstake ETH will likely not go live until early 2024, based on projections from the core dev team.
Despite a second quarter that saw relative strength in the Ethereum ecosystem ahead of the merge, liquidity has been drying up. When normalizing Uniswap TVL with our Ethereum Ecosystem basket to adjust for price changes, we see a 22% decrease in ‘real liquidity’ on the DEX. On-chain activity remains quiet, leaving investors turning away from liquidity provision for yield.

This highlights a battle that many PoS blockchains have been facing. When on-chain activity is low, yields available in the ecosystem tend to come down. When adjusted for long-tail risk, staking tends to be (by far) the best risk adjusted yield in many PoS ecosystems (Ethereum included). Long term, staking yields will compress as new validators come online, but that’s a process measured in years, not months. Near term, expect growing access to staking to cause liquidity to continue to drain out of DeFi in search of safer yield.
Merge Positioning

One of the biggest questions into the merge was whether investors were positioned long or short. While there were a number of signs that pointed toward net long positioning, the biggest flag was in funding rates on Ether pairs. By September 13th, two days before the merge, funding rates on many exchanges were -50%, annualized, or lower. On the day of the merge, funding rates on many exchanges hit lows of -300%, annualized, with some exchanges clearing lows of -500%+

Why such meaningful net long spot exposure into the merge? Two major reasons, neither to do with price. First, Ethereum’s move to PoS represented a ‘fork’ of the main chain. A significantly smaller contingent of Ether miners elected to either move their hashpower to Ethereum Classic, or to the legacy Ethereum PoW chain. This created an ‘airdrop’ opportunity for EThW (PoW Ether, post merge), and the quickest traders sought to arbitrage the opportunity. The second major factor was around liquid staking. While the liquid staking opportunities mentioned above will almost certainly continue to grow in popularity, holding a liquid staked ETH meant both forgoing the EThW ‘airdrop’ and opening up to additional risk. If there was a major issue with the deployment of staking, investors could either have had assets stuck in the custody of a third party or be forced to take a major loss exchanging the staked Ether on the secondary market.
Q4 / The Future of Ether Staking Rewards

ETH Staking rewards will continue to be a safe-haven for investors given the lack of sufficient risk adjusted returns in the space. Using assumptions based on Vitalik’s Github commits and the fact APR is inversely proportional to the number of ETH staked, we created a line of best fit to estimate the timeline for staking rewards falling post-merge.

By the end of 2022, base reward rate for validators should be under 4.5%. Assuming max validator growth, the market should hit Vitalik’s predicted steady stake of ~30mn staked Ether around May 2024 with an expected base reward rate of 3.3%. This baseline will understate total yield to validators as it doesn’t include additional priority and MEV fees paid to stakers post-merge.
Ethereum Going Deflationary

Between EIP 1559 and the merge, Ethereum will have made a significant step toward consistently becoming deflationary. Using data on the total number of Ether staked among active validators, the rate of validators coming online, and average gas metrics, we can predict the minimum gas fee (in gwei) needed for Ethereum to be deflationary. The minimum gas fee grows as the number of ETH staked rises and inflation liability increases. Vitalik expects a steady state to settle in at ~30mn staked ETH, which at max validator activation rates would occur sometime in late April 2024, and would correspond to a base validator return rate of 3.30%.
One of the long-term hurdles that Ethereum will have to overcome is centralization across a variety of fronts: validation, consensus, execution, and hosting, each bringing its own unique set of difficulties. The rise in popularity of liquid staking has concentrated validating power in the hands of centralized organizations like Coinbase and Lido. While the organizations both have some degree of internal validator diversification, it’s certainly worth keeping an eye on. Centralization of the consensus layer was formerly a concern, as 70%+ users were estimated to be running Prysm for the majority of 2021. At this point, the number sits at a healthier 43%.

In execution, Geth remains the client of choice, with almost 78% market share, a meaningful difference over Besu, in second (8.3%), and Erigon, in third (7.4%). Numbers over 50% share are considered to be unhealthy, so expect further focus on decentralization of execution. Hosting remains a non-trivial issue as well, with many critics questioning the decentralization of a blockchain hosted on centralized services. This problem has yet to be resolved, with ~33% of hosting currently done through Amazon, which is actually up from the 25% reported in late 2020.
Avalanche Overview

**BASE STATS**

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<td>NFT Volume (Last 3 Months)</td>
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<td>Nakamoto Coefficient</td>
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<tr>
<td>Average Daily Trading Volume Across Major DEXs</td>
<td>$25mn (-68.0% q/q)</td>
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Avalanche is a Proof of Stake, Ethereum-compatible platform created by Ava Labs that launches project-specific blockchains called subnets. Subnets serve as the database layer for a set of decentralized applications, isolating network activity, reducing fees, and increasing throughput for users.

Through a combination of subnet infrastructure and an Ethereum-like smart contract chain called the C-Chain, Avalanche achieves short time-to-finality and low fees, while maintaining a high level of decentralization. At its core, Avalanche aims to create an environment that fosters new projects to grow natively, before ultimately hitting scale and moving onto a customized subnet. This prevents any individual successful application from 'growing too large' by demanding network resources and increasing network fees for other ecosystem projects. This approach also facilitates an ability to scale through either internal growth or onboarding partners.

Additionally, each subnet has an agnostic execution layer, granting flexibility to the different kinds of potentially deployable blockchains including public/private blockchains, blockchains that adhere to a set of regulatory requirements, or blockchains that use different state machines.
Q3 / C-Chain to Subnet Migration

Viewing transaction data on Avalanche’s C-Chain as a summary of network traffic is incomplete. A core part of Avalanche’s thesis revolves around their ability to effectively transition applications and their existing user base onto subnets to help them scale. When looking at the normalized data, which includes both C-Chain and subnet transaction data, the transition to subnets has resulted in both a decline in C-Chain transactions and a rise in cumulative transactions across all Avalanche chains.
Low fees and fast time-to-finality make Avalanche a popular ecosystem for DeFi. Like Ethereum, Avalanche has seen volumes drop significantly over the past quarter, with average daily volume transacted on Trader Joe, the ecosystem’s largest decentralized exchange, down 68% q/q. Volumes here are worth watching as the DEX rolls out their new ‘Liquidity Book’ AMM, which aims to increase capital efficiency and mitigate impermanent loss.

Amid quiet on-chain markets, Avalanche has also found a relative bright spot in GMX, the largest decentralized perpetual exchange on Avalanche. The protocol has facilitated the trade of $4b worth of assets in the past 3 months, a 10.1% decrease q/q. By continuing to play to its strengths on fast, secure, and cheap execution, Avalanche can continue to onboard complex DeFi protocols, particularly startups that may get priced off of Ethereum.
Growing NFT Demand

Compared to Ethereum or Solana’s NFT volume, Avalanche’s NFT volume is low. In the last quarter, the GameFi game Chikn, Joepegs, and NFTrade were the largest contributors to NFT volume comprising 55.9% of NFT marketplace volume. Given Solana’s successful playbook of growing an NFT economy off of Ethereum, there is precedent for meaningful growth in the sector.

Avalanche hopes to grow the NFT ecosystem through two major facets- native NFT creation and onboarding GameFi. If successfully on boarded, large Web2 games could potentially drive volume. Additionally, the rollout of Joepegs as both a competitive NFT marketplace and launchpad, amid a relatively limited set of existing options, has helped promote creators releasing on Avalanche.
The C-Chain has historically dominated active wallet share across Avalanche subnets. However, its share has started to decrease and should continue to wane over time as more subnets are onboarded. - Source

There are at least two major platform upgrades that need to reach scale for Avalanche to reach maturity: permissionless subnets and native-subnet bridging. Currently subnet validators are permissioned, which increases centralization, but allows users and operators to assume a higher level of network trust. In a decentralized system, there cannot be a centralized entity that gatekeepers network participation.

Native-subnet bridging is another major milestone reducing friction onboarding new users onto subnets, reducing risk for moving assets between ecosystems, and helping create a more interoperable ecosystem. Native-subnet bridging enables the transfer of digital assets across subnets without relying on wrapped assets from smart contracts as intermediaries of value.

While not a platform upgrade, another important development for the ecosystem is the adoption of a subnet using a non-EVM virtual machine. Avalanche’s agnostic execution layer is a differentiator from monolithic blockchains. Monolithic blockchains have no flexibility in running multiple state machines, but the benefits of Avalanche’s execution layer have not yet been realized. Avalanche leadership has publicly stated they are developing EVM++, an Avalanche-developed EVM alternative, but the adoption of any non-EVM subnet would mark a win for the ecosystem.
Mainstream Adoption of Curated DeFi Products

In September, KKR & Co, announced it will tokenize a portion of its Health Care Strategic Growth fund on the Avalanche blockchain. This movement could herald the oncoming of a more significant movement- digitization of formerly illiquid assets, a market that BCG recently wrote could grow to be 10% of GDP by 2030.

While we remain in the very early stages of development, capturing value in this market represents a long-term value proposition for the space.

1Relevance of on-chain asset tokenization in ‘crypto winter’, by Sumit Kumar, Rajaram Suresh, Darius Liu, Bernhard Kronfellner and Aaditya Kaul (BCG)
Collaboration with Web2.5 and GameFi

GameFi games potentially require nonstop state changes on the blockchain. Cheap fees and fast transaction speeds are ideal for making frequent state changes, making Avalanche a strong candidate for GameFi builders. Subnet customizability enables gaming ecosystems to create treasuries, incentive network contribution, or create community rewards through fee allocations from native tokens.

Avalanche has already publicly announced a handful of AAA games to be released in the ecosystem; however, AAA games take years to develop, especially on a new technology stack in an unestablished market. While AAA game titles are in development, Web2.5 games are a prime medium for onboarding new player bases.
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Polygon Overview

BASE STATS

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<tr>
<td>Average Daily Trading Volume Across Major DEXs</td>
<td>$120.37M (-23.56% q/q)</td>
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Polygon is a decentralized Ethereum scaling platform powered by the $MATIC token. Polygon aims to create a suite of scaling solutions that will enable developers to build scalable applications (cheap transaction fees) without sacrificing security.

This blockchain technology includes:
- Polygon Mainnet: a modified Proof-of-Stake blockchain
- Polygon Supernet*: an application dedicated blockchain
- Polygon Avail*: a data availability-focused blockchain
- Polygon Zero*, Polygon Miden*, and Polygon zkEVM*: zk-rollup blockchains
- Polygon Nightfall*: a privacy focused rollup chain

*In development

Polygon’s crown jewel, the PoS blockchain, has consistently provided users with lower transaction costs and higher throughput than Ethereum. Polygon’s guiding principle has been to increase its adoption worldwide. While the PoS chain was the first exploration in scaling Ethereum, the Polygon team is now focused on the rollout of a zero-knowledge Ethereum Virtual Machine, or zkEVM, that will provide a major technological differentiator against other Layer Twos.
Polygon's nominal decline in Total Value Locked on the chain is in-line with the broader crypto landscape. Interestingly, when normalizing data for asset price to more accurately capture changes in liquidity, Polygon’s TVL for the quarterly is flat and up significantly from the lows.

Expecting blockchains to near all-time high DeFi metrics amid a significant slowdown in on-chain activity is unreasonable. The ability to protocols and chains that are able to continue to incentivize builders and investors through value capture or creative partnerships remains a primary differentiator leading through the next cycle.
Sustaining User Growth

Amid a slow quarter for on-chain activity, Polygon’s core metrics held up well. Over the last quarter, the network maintained over 200,000 daily active addresses, up 10% q/q, alongside 2.5mn daily transactions and 171mn unique addresses.

Even more notable was DEX volume, which held consistent at ~$4B q/q, with Uniswap gaining significant market share within Polygon Ecosystem (69% market share last quarter). Relative to the drawdowns in DEX volume that nearly every other chain is facing, Polygon’s consistency is worth noting.
In mid-August, Polygon’s bridge saw massive USDC inflows of nearly $250mn before flattening. The initial jump came in the form of a $70M USDC inflow as a result of an integration with Circle to create a Polygon-native version of the popular stablecoin. This initial liquidity seed likely assisted USDC uptake within the ecosystem, and created ease for further USDC to be bridged onto Polygon. While they may have ceded some market share in DeFi relative to other L2s over the last cycle (especially compared to new peers Arbitrum and Optimism), Polygon continues to do an exemplary job onboarding new liquidity into the ecosystem.

This growth trend has helped Polygon maintain share, and even quietly grow, relative to these other scalable chains. As zkEVM tech launches and Polygon’s tech stack grows for builders, they will have an opportunity to create network effects from their efforts to scale liquidity.
This quarter, the Polygon team struck deals with numerous traditional industry-leading brands like Mercedes-Benz, Disney, and Starbucks. In tandem with these deals, Polygon spent more time than many other chains focusing on capturing the retail and non-crypto native audience.

Like Avalanche, a large part of Polygon’s long-term thesis is predicated on their ability to continue to onboard new institutional & corporate capital, while simultaneously building infrastructure that entices DeFi-native builders to include Polygon on their deployment stack. Prior to the full rollout of zkEVM in 2H’23, focus on Polygon’s Business Development team as a primary differentiator and measure for success of their thesis.
With the Merge finally going live at the end of Q3, the coming quarter should bring meaningful development for Polygon. Of particular note is the continued expansion of its suite of scaling solutions. While the Polygon PoS chain was a first step toward the team’s goal of Ethereum scalability, the future of the thesis revolves around zkEVM rollups. This privacy-focused scalability title represents a broader set of products simultaneously in development:

- **Polygon Avail**: (Testnet launched) Scalable data availability for blockchain
- **Polygon Zero**: a ZK Rollup with the speed of Plonky2
- **Polygon Miden**: a STARK-based zk rollup
- **Polygon zkEVM**: an EVM equivalent zk-rollup

Polygon zkEVM will be fully EVM-equivalent, which means developers can deploy any smart contract without major changes.

The impact on industry discussion of zkEVM as a result of Polygon’s announcement was evident when tracking engagement data. Although the conversations on the topic have cooled off amid other popular themes, the meaningful initial discourse shows Polygon’s extensive investments in upgrading tech could prove timely.
On November 1st, the Polygon Foundation will receive the last MATIC distribution of 273mn MATIC, or $200M, at current MATIC price. Based on standard Foundation practice and historical wallet activity from Polygon, this distribution will likely be sold over a long period of time to continue to fund development. Currently the foundation contract holds 6.9% of supply; after the final distribution that number will rise to 9.6%. Given an average daily trading volume of around $200M, this unlock is unlikely to significantly impact the MATIC price over the next quarter.

More notably, this unlock marks a new milestone for MATIC tokenomics, as all the vested tokens of early participants will be released (95% of total supply). This removes a major overhang from the token, and should help create investor trust, particularly amid high incentives and inflation from other newly launched L2 competitors. The remainder of the locked tokens will be gradually unlocked to incentivize Polygon network security until 2025.
Solana Overview

BASE STATS

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Solana is a public blockchain that adopts a monolithic design, wrapping transaction execution, network consensus, proof settlement, and data availability on one main-chain. This is distinct from modular chains, which aim to outsource some of these functions to a separate layer. Solana believes that in the long run, the modular approach will become redundant as they serve as a solution for issues that could be later resolved with hardware developments. In order to support this thesis, Solana’s speed is scaled based on Moore’s law, which states that the performance capabilities of computers will double every two years.

Solana distinguishes itself from other Layer Ones through its Proof-of-History (PoH) timing, which is used to improve the performance of Solana’s Proof-of-Stake (PoS) mechanism. Proof-of-History creates a historical record that proves the existence of a particular event at a particular point in time. Each validator records their individual time by encoding it through a sequential-hashing verifiable delay function (VDF). As a result, there is no need to wait for validators to communicate with one another for confirmation before proceeding, which improves its efficiency in terms of speed and capacity.

Since its launch, Solana has held its position as an L1 network offering one of the highest transaction throughputs (TPS), the shortest time to finality (TTF), and the most monthly-active contributors of any ecosystem. This has created a robust DeFi and NFT ecosystem.
The core promise of blockchain technology involves a constant battle to balance data security, decentralization, and speed. Healthy validator participation is a requirement to achieve these feats in tandem. The Solana Mainnet Beta network went live in March 2020 and has since scaled into a network consisting of over 3,400 validators across six continents. Additionally, there are over 1,900 consensus nodes, with an average of 95 RPC nodes joining every month since June 2021.

A crucial part of the Solana thesis revolves around the use of larger block size to create higher maximum throughput than previous generation chain- in line with the team's tenet of scaling with Moore's law. This improves the long-term theoretical scalability of the blockchain relative to existing options, but imposes higher hardware requirements on validators. Sustained validator growth, particularly decentralized validator growth, suggests that hardware costs haven't pushed the cost of validation too high.
The Nakamoto coefficient measures decentralization by depicting the minimum number of nodes required to be compromised before a blockchain’s network is susceptible to disruption. Due to this, Nakamoto coefficient has emerged as a popular way to contextualize relative decentralization among blockchains. The more decentralized a blockchain is, the higher its coefficient.

Solana’s score has been steadily increasing since launch, and currently leads relative to other smart-contract L1 blockchains with a coefficient score of 32.
NFT uptake on Solana grew substantially over the past year before finally cooling off amid tougher market conditions. Solana processed total NFT secondary sales volume of $230 million during Q3, which was down ~68% q/q. Given that transactions are processed in SOL, which is down significantly over the same time period, this difference in volume likely overstates the real drawdown in activity.

While Ethereum still engulfs Solana in total NFT sales volume, it’s important to note that Solana’s NFT marketplace is still in its infancy when compared to Ethereum. Solana’s best month of the quarter came in September (40% of volumes) amid stable token price, and newer ecosystems will naturally sustain higher volatility.
Since their launch in 2020, Solana has experienced seven network outages, 5 of which have been in 2022 alone. These network outages result from validators being unable to process transaction loads at peak periods, along with congestion and spam events. That being said, Q3 turned out to be a good month for Solana’s network uptime, with no network outages occurring.

Despite the volatility in general performance metrics, largely due to macroeconomic events, Solana has continued to work towards optimizing its network infrastructure. There are currently three upgrades being developed that will not only directly address primary pain points such as network outages, but also introduce novel mechanisms that will affect the overall reliability of the blockchain. These upgrades include QUIC, a stake-weighted QoS, and a novel fee prioritization mechanism. QUIC introduces the ability to verify IP addresses, meaning if a malicious actor is intentionally or unintentionally spamming the network, validators can identify the source and apply policies to limit the number of messages from said source. Stake-weighted QoS is in parallel development with QUIC and is expected to be rolled out on mainnet beta soon.
One of the major points of Solana’s thesis revolves around scaling throughput as demand for blockspace grows. This creates a give-and-take between higher base throughput than most other chains, but also imposes higher hardware requirements for validators. While there hasn’t been an immediate impact in decentralization (visualized via Nakamoto), exponentially rising hardware costs could ultimately be a vector for centralization for validators.

If blockchain technology is successful in onboarding legacy platforms in payment, fintech, and gaming on its roadmap it will need the capacity to process significantly more transactions than currently possible. Existing blockchains, like Ethereum seek to scale this capability long-term through upgrades like Sharding and rollups, which creates a different set of risks. Even post-upgrade, proponents for next generation chains believe that many chains will ultimately still face fundamental barriers due to smaller block size and architecture.
In its current state, fees on Solana are fixed and are executed on a first-come-first-serve basis. During competitive network events such as NFT mints, it isn’t uncommon for users to find transactions failing. Without a means to communicate priority to the network, users (primarily bots) tend to spam transactions to the leader with the hopes of a successful execution. This process creates more traffic than the network can efficiently handle.

Solana is in the process of rolling out a novel priority fee structure that will enable users the ability to set an additional fee, collected upon execution of the transaction and its inclusion in a block. The ratio of this fee to the requested program’s computational cost to perform all operations will be used to determine the priority weight of a transaction’s execution. Once implemented, Solana’s network should see a significant improvement in the amount of invalid or duplicated messages sent to the network. Fee markets will be implemented after QUIC is fully adopted and UDP is disabled.
Arbitrum Overview

BASE STATS

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Capitalization</td>
<td>n/a</td>
</tr>
<tr>
<td>TVL</td>
<td>$915.17M (+12.02% q/q)</td>
</tr>
<tr>
<td>Cumulative NFT Volume</td>
<td>$100.87M (+25.28% q/q)</td>
</tr>
<tr>
<td>Cumulative Verified Contracts Deployed</td>
<td>2249 (+12.9% q/q)</td>
</tr>
<tr>
<td>Cumulative Top 3 DEX Volume</td>
<td>$2.75B (20.85% q/q)</td>
</tr>
</tbody>
</table>

Arbitrum is a Layer 2 blockchain built on top of Ethereum, with the objective of enabling faster transactions and greater scalability. Arbitrum comes loaded with a unique set of benefits:

- **Trustless Security**: Ethereum-based security, in which any one party can assure proper Layer 2 outcomes.
- **Ethereum Compatibility**: Capable of running unmodified EVM contracts and Ethereum transactions.
- **Scalability**: Achieved by offloading contract processing and storage from the main Ethereum chain, allowing for substantially larger throughput.
- **Minimum Cost**: Developed and constructed to reduce the system’s L1 gas footprint, lowering per-transaction costs.

A leader in the layer 2 space, Arbitrum has a 51.72% control of the marketshare. This is a result of its successful marketing and promotional campaign, as it currently has over 297k followers on Twitter and more than 100k discord server members. Additionally, Arbitrum’s ecosystem consists of over 80 decentralized applications, by far the largest in the layer 2 arena. Under the hood, Arbitrum provides the fastest recorded transactional throughputs as well as the shortest time to finality, compared to other layer 2s.
Nitro is the most recent development of Arbitrum technology. It is a fully integrated layer 2 optimistic rollup system that includes fraud proofs, a sequencer, token bridges, enhanced calldata compression, and more. Nitro's primary element is a new prover that can do traditional interactive fraud proofs of Arbitrum via WebAssembly (WASM) code. This means that the custom-designed language and compiler currently in use can be replaced by standard languages and tools for writing and compiling the L2 Arbitrum engine.

The combination of successful promotional campaigns and marketing has led to strong user growth, retention of current users, as well siphoning users from competitor ecosystems like Optimism. Launch of Arbitrum Nitro enabled DEX volume to surge as a result of near zero gas fees, with this quarter seeing more than $2 billion in cumulative trading volume across three major DEXes (+21% q/q). Arbitrum transactions are currently 90-95% cheaper on average than Ethereum, with gas fees set at a standard 0.1 gwei.
Arbitrum’s Total Value Locked for the quarter was roughly flat, noteworthy given that Arbitrum, unlike its peer Optimism, hasn’t launched a token that can be used to incentivize TVL natively. Relative to L2s with tokens, we would expect that Arbitrum would have a lower average incentive emissions per dollar locked (measuring the cost of acquiring liquidity).

Like Avalanche, the standout project on Arbitrum this quarter was GMX, which deployed multichain (Arbitrum & Avalanche). The protocol generated more than $18 million in fees for holders, and maintained a cumulative TVL of $323,301,247. Arbitrum’s healthy DeFi scene should continue to see new user growth driven by token launch and resumption of onboarding campaigns.
Without a token, tracking Arbitrum is focused more on analyzing the user growth and development taking place in the ecosystem. Quarter-over-quarter daily transactions are up 62.7% despite an unfavorable macroenvironment. Optimism, a competing L2, launched a token launch campaign earlier this year, which helped draw attention to scalability developments broadly.

Arbitrum’s ability to maintain consistent growth without some of the incentive advantages of its peers make it especially noteworthy. Fading rewards from Optimism have caused influxes in Unique Addresses and contract interactions to fall, further stressing sustainability as a long term goal for ecosystems.
Q4 / Nitro Post-Merge

The Merge is set to allow for efficiency and increased throughput throughout the Ethereum network. As L2s use Ethereum for their security layer, layer 2s should see a bump in efficiency as well. Towards the beginning of the Q3, there was a jump in block count as a result of the influx of Odyssey users resulting in high block time. Inversely, there was a steep decline in block time and rise in block count post-upgrade. As Nitro continues to develop and as Arbitrum onboards new users, we can expect to see block count further rise, while block time continues to descend.

While Nitro brings many improvements, it is by no means the be-all-end-all for Arbitrum. Decentralization has suffered as a result of Arbitrum’s innovation; currently only nodes authorized by Arbitrum may validate transactions, and the sequencer remains internal. Decentralizing fair sequencing is simple when viewed from a distance, but is more difficult in practice. Many expect Arbitrum to follow in the footsteps of its rival Optimism in releasing a token to instigate decentralization.
On April 13th, Arbitrum announced The Arbitrum Odyssey. In it, they took 56 of the most active projects on Arbitrum and had the ecosystem vote on which projects get to participate. In the 8 week event, users must complete tasks on-chain to get NFT rewards. The initial launch was more successful than expected- by the end of the first week of Odyssey, the decision was made to halt it as gas prices rose significantly above expected levels.

Now that Nitro has fully launched, improving scalability and throughput, the plan is to continue the remainder of the seven week program. Assuming macroeconomic factors haven’t notably affected user conviction from April, expect Odyssey to be a crucial catalyst for Arbitrum’s DeFi onboarding and eventual token launch.
NFT Ecosystem

There is a fairly limited selection of NFT marketplaces on Arbitrum, consisting of largely smaller, native platforms like TofuNFT or Stratos. Opensea, which announced that it will launch Arbitrum NFT support starting September 21st, bodes well for ease of onboarding new users. Among the first collections to be brought on will be Smolverse, GMX Blueberry Club, and Diamond Pepes.

The combination of new infrastructure, incoming users with new NFTs from Odyssey, and a token launch create a perfect storm for growth in the sector on Arbitrum.
<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
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<tbody>
<tr>
<td>New Stories</td>
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<tr>
<td>New Sources</td>
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<tr>
<td>Unique Tags</td>
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<tr>
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<tr>
<td>Reddit Comments</td>
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<tr>
<td>Tokens Added to Coverage</td>
<td>68</td>
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</tbody>
</table>