

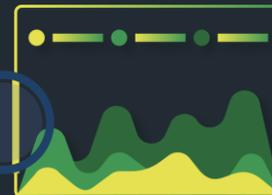
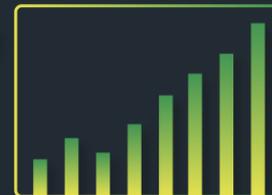
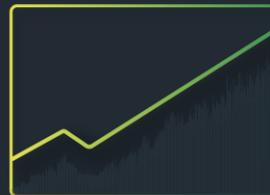


CoinGecko

Yearly Report

2021

FULL REPORT



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Analysts:



Win Win



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Shaun Lee



Dillon Yap



Weng Dee



Yi Hong



Zhong

Founders' Note

2021 saw the crypto industry continue to scale new heights, extending momentum from 2020. While an end of year dip may have dampened spirits, overall industry market capitalization grew by >3x in 2021 to close at ~\$2.4 trillion, briefly reaching an ATH of \$3 trillion.

Bitcoin ended the year at ~\$48,000, down from its ATH but still representing a 2x increase during the year. However, its dominant market position has waned, falling to below 40% at the end of 2021. Much attention has shifted to Ethereum, its many forks and L2 chains which claim to fix its scalability issues, as well as new L1 chains such as Solana and Terra. Pour one out as well for meme coins which seem to have captured their own following.

DeFi projects continued to innovate in 2021, bringing new features with each new version upgrade, as well as new decentralized models of finance altogether. DeFi also successfully branched out from Ethereum onto other chains, quickly becoming "table stakes" for any network. Overall, TVL in DeFi protocols rose to \$234 billion, showing healthy growth.

The killer app for crypto in 2021 though was undoubtedly NFTs. Outsized sale prices, participation from well-known artists, and Axie Infinity firmly vaulted crypto into mainstream consciousness, bringing in a new wave of users to the space. Total traded volume for NFTs in 2021 reached \$23.9 billion, capping off a banner year for this new asset class. We recently released a "How to NFT" book which lays out a beginners' guide to this space, so check that out if you're looking for a way in. NFTs and DeFi have also started to collide with GameFi, SocialFi, and other interesting use cases, and we're excited to see how that continues to unfold.

It's impossible to talk about NFTs without also mentioning the metaverse. Facebook's rebranding to Meta dominated headlines and generated a million think pieces on the next evolution of the internet, the elusive Web 3.0, while also at the same time attracting more talent and investments than ever before into the space. With broad acceptance that an open metaverse will not be possible without NFTs and blockchains, expect both to continue to flow into the industry.

And if you thought that was all, let's not forget related developments "off-chain" in 2021. While the cautious optimism which met Gary Gensler's appointment as SEC Chair quickly evaporated, it also led to the approval of US Bitcoin ETFs. Coinbase's IPO and the crypto investments of MicroStrategy and (briefly) Tesla continued to garner attention and coverage from traditional media, but perhaps none more so than Bitcoin becoming legal tender in El Salvador. In China, the government continues to expand its e-RMB CBDC experiment, with a wider rollout expected soon, while at the same time cracking down on cryptos and crypto-mining, triggering the great mining migration out of China.

Crypto never sleeps, and that saying has never been truer in 2021! We now track >12,000 coins across 500+ exchanges, started a new NFT section, rolled out a new app, and hosted our first GeckoCon, amongst many other new features and updates to our website. As the crypto industry stretches out across broader horizons, we continue to expand our team and offerings towards serving the community and enabling a decentralised future for everyone. Expect more to come in 2022!



Bobby Ong
COO

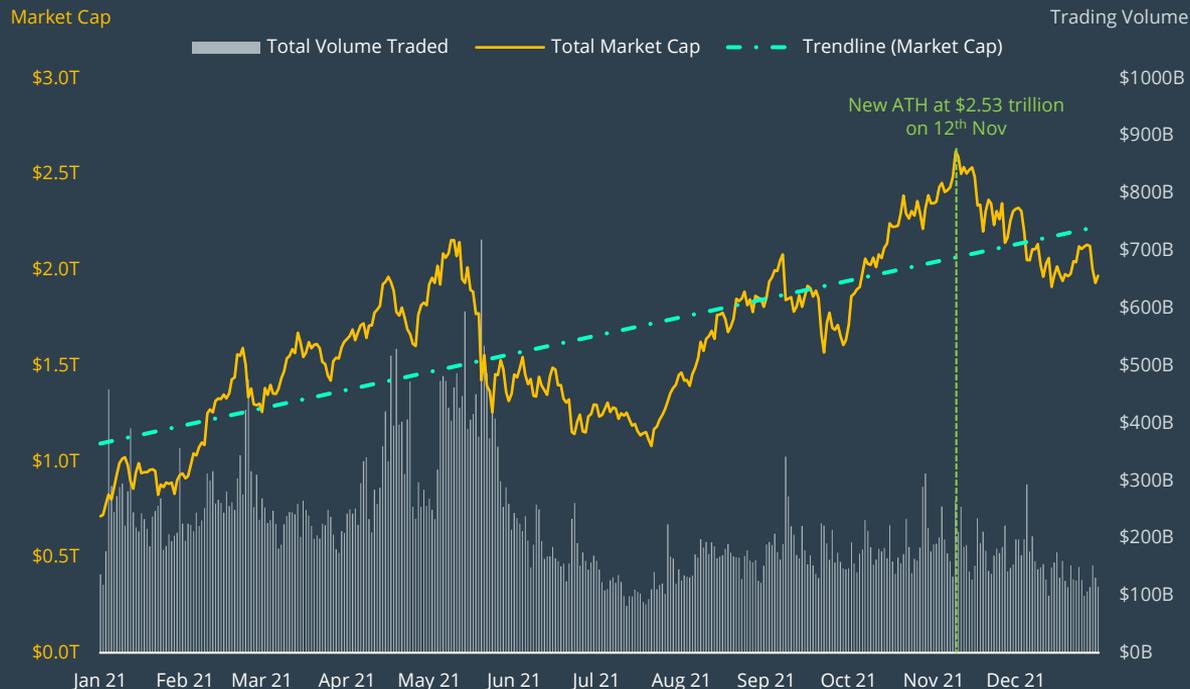
TM Lee
CEO

MARKET LANDSCAPE

2021 Spot Market Overview

Crypto market cap closed out 2021 at \$2.0T, showing strong growth despite year-end dip

Top 30 Market Cap & Spot Trading Volume in 2021



Data source: CoinGecko

+176%

Top 30 Coins Market Cap Growth in 2021

Market cap of Top 30 Cryptos hit an **ATH at \$2.53 trillion** in November, before taking a dip at the end of the year.

Alternative L1 chains, ETH L2 chains, and meme coins surged, sending Bitcoin's dominance tumbling to a historical low. Meanwhile, Ethereum continued to grow despite scalability and gas fee challenges.

Stablecoins continued to gain traction, with Terra USD (UST) making a late surge to break into the Top 30 coins.

Spot trading volumes surged early in the year matching the growth in market cap but tapered off after the May dip. The 2nd half growth of the year was mainly driven by NFTs. **Liquidity continues to diversify away from CEXes** to DEXes and Derivatives Exchanges.

2021 Top 5 Crypto Returns

Solana goes to the moon in 2021 to break into the Top 5

Top 5 Cryptocurrency Returns in 2021

Price Return (%)



Price Return (x)



+2,913%

Top 5 Cryptocurrencies
Average Returns in 2021

Top 5 Crypto Returns took a quantum leap in 2021 compared to 2020 (+242%), though largely skewed by SOL.

SOL only broke into the Top 5 in Q4 2021, pushing out XRP, DOGE and DOT which were all on the Top 5 crypto list at various points during the year.

XRP (+281%), DOGE (3,545%), DOT (+194%) still generated good returns for investors by the end of the year.

Other than SOL, **LUNA, SHIB, MATIC, AXS and FTM** in the Top 30 all delivered 5 digit percentage returns or more during 2021.



62.6%
+303%



403.0%
+472%



1,286%
+178%



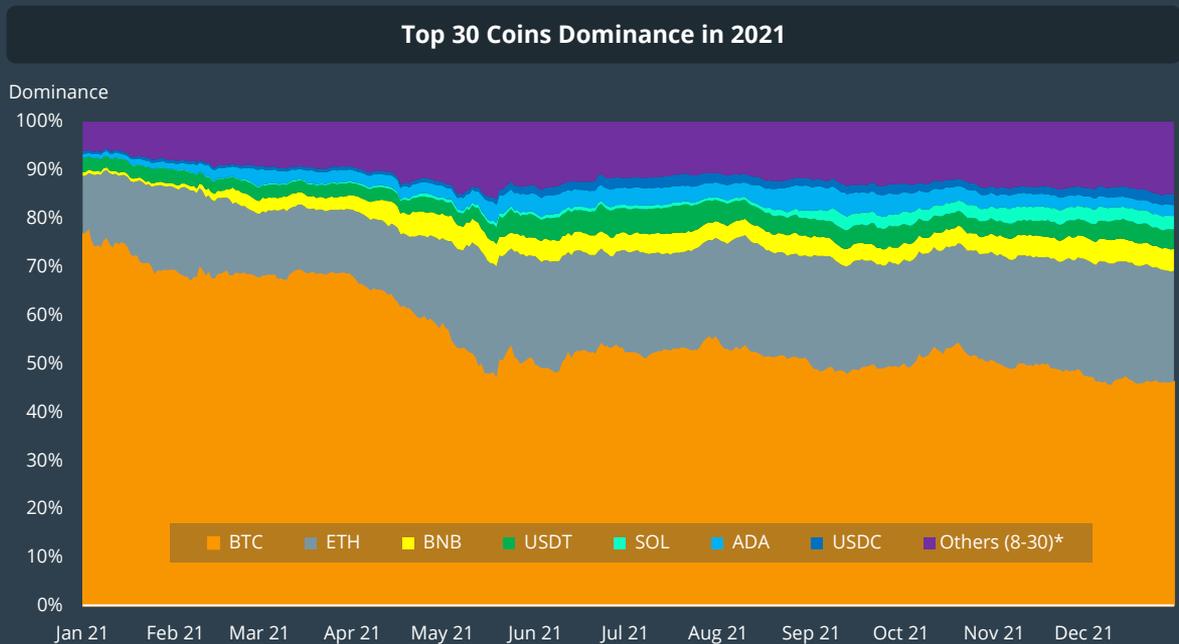
11,281%
+\$61%



645.9%
+461%

2021 Top 30 Coins Dominance

Alt-L1s, ETH L2s & sidechains, Memecoins, Stablecoins surge as Bitcoin dominance falls



New alternative L1 Chains, as well as Ethereum L2s & sidechains ride a strong narrative wave around solving Ethereum's scalability challenges to springboard into the Top 30.

Memecoins also found a fervent offering, with Elon Musk giving Dogecoin a new lease of life and spawning a slew of new memecoin projects.

Old is still gold? Despite a lack of buzz (or sometimes negative news), older coins like ADA, XRP, LTC, BCH still retains places in the Top 30.

BNB, CRO and OKB continue to fly the flag for **CEXes**.

AXS creeps in to Top 30 to cap a year of tremendous growth for Axie Infinity.

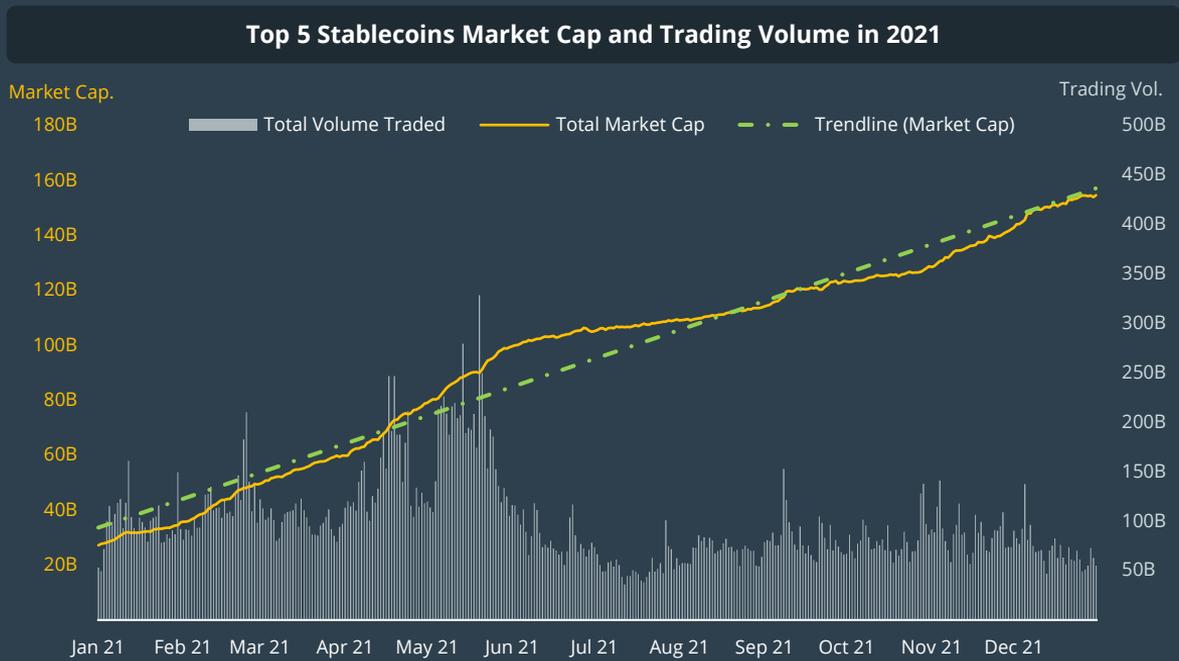
Outside of the Top 30, there is a **long tail of ~90 projects which has cracked \$1B in market cap**.

 45.3% -30.4%	 22.4% +10.6%	 4.4% +3.7%	 4.0% +1.1%	 2.7% +2.7%	 2.2% +1.4%	 2.2% +1.6%	 16.7% +9.2%
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Data source: CoinGecko

2021 Top 5 Stablecoins Overview

Market cap of stablecoins continue to grow, with Tether still leading the pack



+\$127_B
 Top 5 Stablecoins Market Cap Growth in 2021

Market cap of **top 5 stablecoins** grew by **469%**, with all 5 now within the Top 30 coins by market cap.

Tether is still the dominant stablecoin despite its regulatory issues, with a larger market cap than the other 4 combined.

A late surge from UST saw it squeeze ahead of **Dai** in the rankings, largely driven by growth in the Terra ecosystem.

Outside of the Top 5, MIM and FRAX have both garnered >\$1B in market cap by end-2021, perhaps indicating **growing acceptance of algorithmic stablecoins.**

 **\$78.4B**
 +\$57.5B (+275%)

 **\$42.4B**
 +\$38.5B (+981%)

 **\$14.7B**
 +\$13.7B (+1392%)

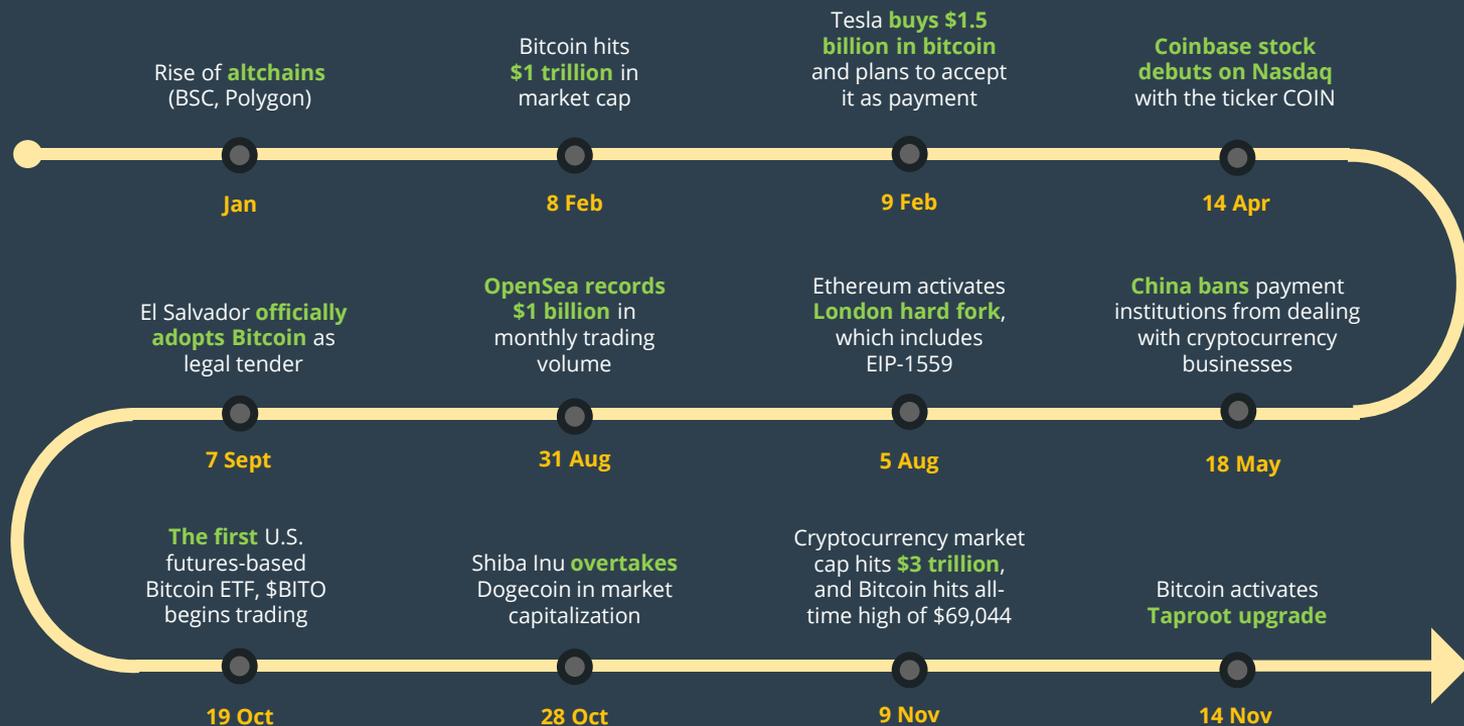
 **\$10.1B**
 +\$9.9B (+5496%)

 **\$8.9B**
 +\$7.8B (+665%)

Data source: CoinGecko

Notable Events Timeline for 2021

A year filled with major milestones for crypto



Notable Crypto Bugs and Exploits in 2021

An estimated \$14 billion was lost through bugs and hacks in 2021



2021 was an action-packed year with an estimated **\$14 billion** lost through bugs and hacks throughout the year.

The **largest hack of 2021** took place in August when **Poly Network** was exploited for **\$611 million**. This makes it one of the largest crypto hacks to have ever taken place.

Compound's reward Reservoir bug was the largest of the year, with **\$147 million** worth of COMP drained before the bug was patched.

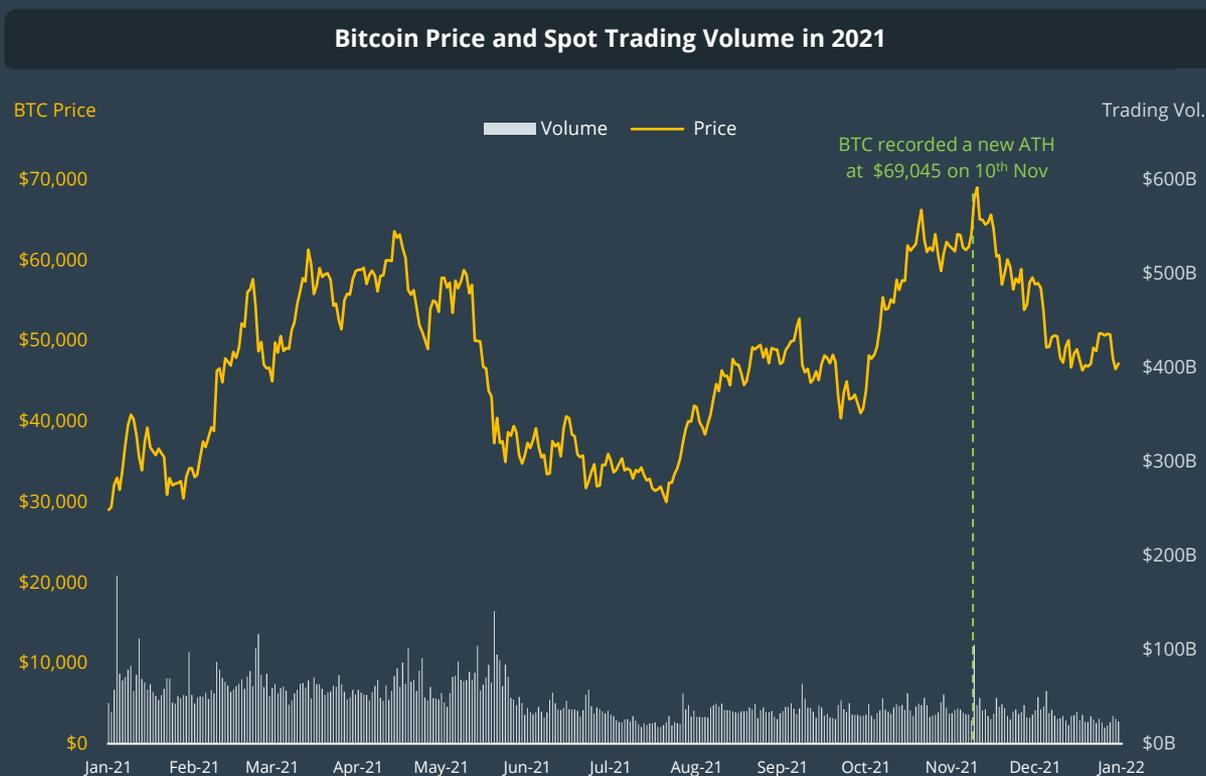
Polygon discovered a critical vulnerability in their PoS genesis contract on Dec 3 which put **9B MATIC at risk**. A silent network upgrade was executed within 24 hours, but not before a hacker made away with **~800k MATIC (\$1.6M)**.

- Certain protocols were hacked multiple times in the year.
- **Cream Finance** was hacked three times in 2021, losing a total of \$185.5 million.
 - **THORChain** was hacked twice in July, setting it back by \$13 million

BITCOIN ANALYSIS

Bitcoin Price vs. Trading Volume

An eventful year for Bitcoin in 2021, but relatively muted price action



Data source: CoinGecko

+62.6%

BTC Price return in 2021

Price action of BTC throughout 2021 was rather muted when compared to 2020. However, Bitcoin still ended the year on a positive note at **\$47,191**, representing a **62.6% increase** year-on-year.

Bitcoin hit an all-time high as well, reaching **\$69,045 on 10th November** before pulling back.

The year was marked by many noteworthy events as well;

- **Public listed companies** added BTC to their treasuries
- **El Salvador** adopted BTC as a form of currency
- **Crypto clampdown** by Chinese authorities, and great mining migration
- **Taproot upgrade launched**, providing greater privacy and enabling the deployment of smart contracts

Bitcoin Mining Hash Rate

Hash rate has rebounded and even hit its ATH since China ban

Bitcoin's Total Hash Rate in 2021



+18%

Hash rate increase in 2021

Bitcoin's total hash rate crashed after Chinese authorities announced a mining ban on 21 May 2021, dropping Bitcoin hash rate to a **multi-year low of 85M TH/s**.

However, total hash rate has since recovered to **168M TH/s** by the end of 2021, even hitting ATH of **182M TH/s** on 10 Dec - a testament to the network's resilience.

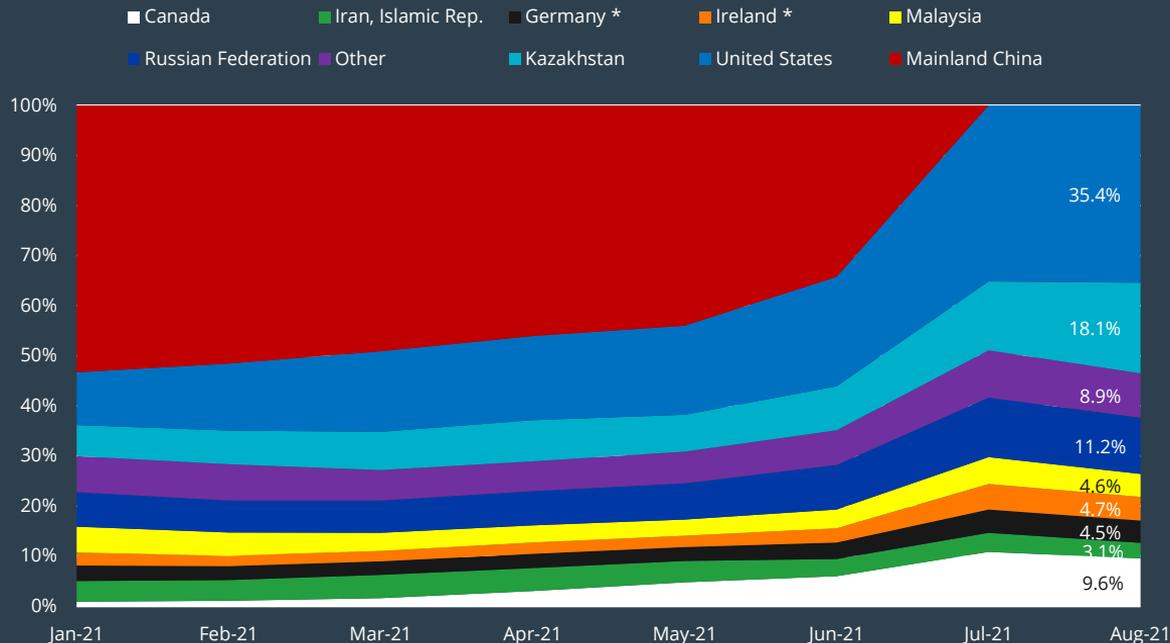
Several Bitcoin miners reaped record-breaking profits in Q2 due to reduced competition from Chinese miners, following the fall of hashrate within the same period of time.

The strong hash rate recovery was largely due to the Great Mining Migration from China to the rest of the world like the US and Kazakhstan.

Bitcoin Mining Hash Rate by Countries

US and Kazakhstan have mainly stepped in to fill the gap, but challenges remain

Bitcoin's Total Hash Rate by Country (Jan-Aug 2021)



After China's crypto ban in September 2021, BTC miners **flocked** to other countries like the US and Kazakhstan for **more favorable electricity prices** and to **avoid the regulatory crackdown**.

As of Aug-21, US led with ~35% of total hash rate share, followed by Kazakhstan at ~18%, a country known for its cheap and abundant coal power.

However, recent reports have alleged **frequent power cuts** to Bitcoin farms in **Kazakhstan** since its **electricity shortfall** in October. Likely, its total share of global hash rate has significantly reduced compared to its August numbers.

Regardless, any such dips was temporary as the global hash rate maintained a **steady climb** towards the end of 2021 with miners likely having migrated to other countries. Interestingly, as much as 20% of the Bitcoin network still reportedly exist in China as **underground mining operations**.

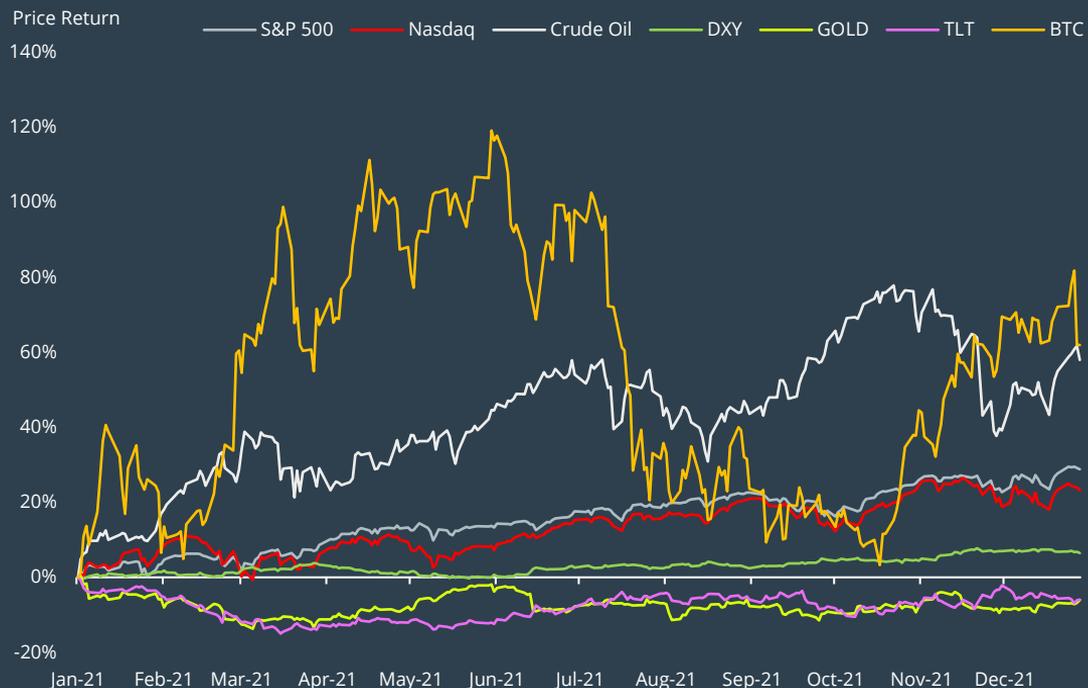
*There is little evidence of large mining operations in Germany or Ireland that would justify these figures. Their share is likely significantly inflated due to redirected IP addresses via the use of VPN or proxy services.

Data source: [Cambridge Centre for Alternative Finance](#)

Price Returns: Bitcoin vs. Major Asset Classes

Bitcoin outperformed all major asset classes in 2021 despite its relatively small return

Bitcoin vs. Major Asset Classes in 2021



	2021 Return	2020 Return
BTC	62%	281%
CRUDE OIL	58%	-21%
S&P 500	29%	15%
NASDAQ	23%	42%
DXY (US Dollar Index)	6%	-7%
GOLD	-6%	24%
TLT (Treasury Bonds)	-6%	13%

Bitcoin has outperformed all major asset classes in 2021, **posting a climb of 62%**.

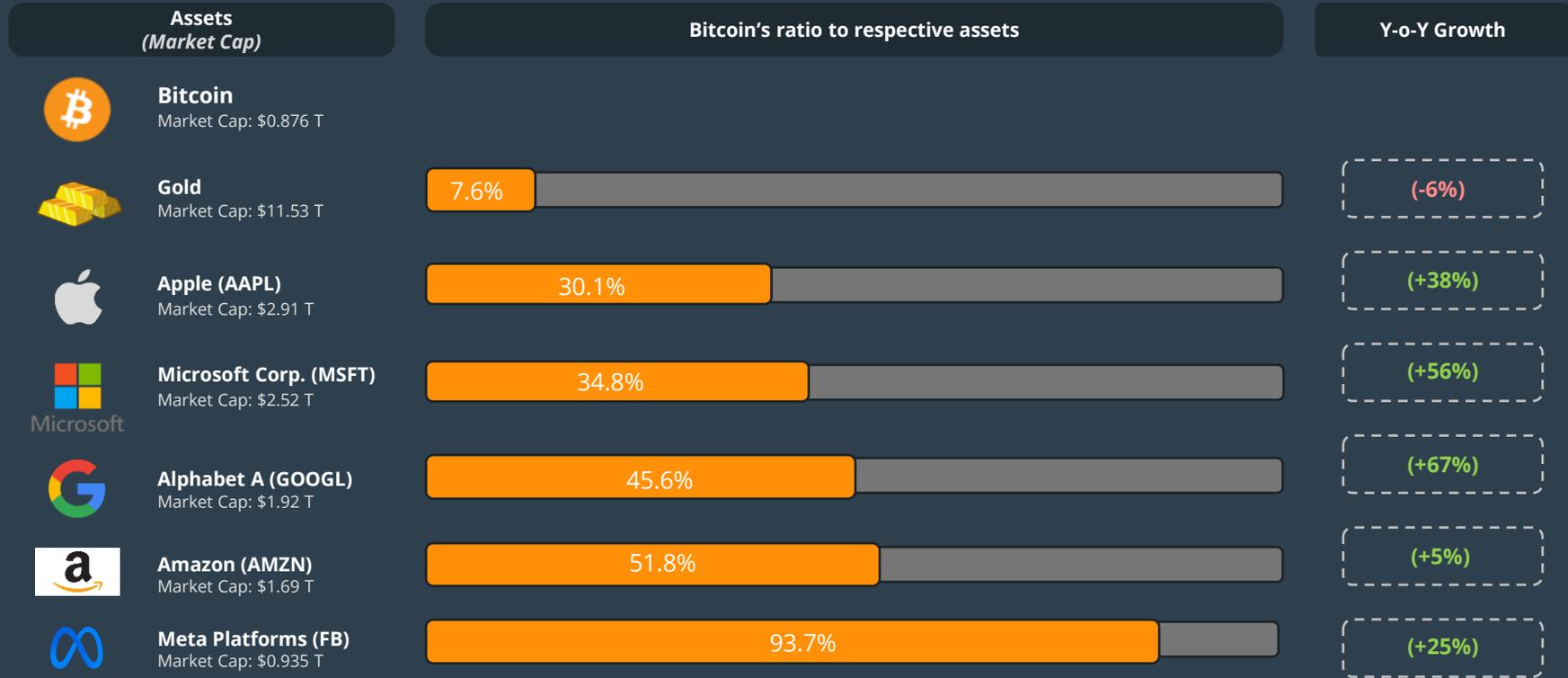
Markets were largely in risk-on mode as interest shifted to equities and commodities, leaving Gold and Treasury bonds behind.

Bitcoin has seen its correlation with major asset classes trend down in 2021. This wasn't always the case for the digital asset. It used to be closely positively correlated with assets such as gold and equities in 2020.

Prices of Major Asset Classes sourced from: <https://finance.yahoo.com/>

Market Capitalization: Bitcoin vs. Gold vs. Top 5 S&P500 Stocks

Bitcoin's market capitalization is now close to that of Meta



Data snapshot taken on 1 Jan 2022; Price of Assets (other than Bitcoin) sourced from: <https://finance.yahoo.com/>

Bitcoin Treasuries in Public Listed Companies

Public listed companies now hold 1.14% of the total Bitcoin supply

Company	Total Bitcoin	Rank	% of Total BTC Supply
MicroStrategy Inc.	124,391 BTC	#1	0.576%
Tesla	48,000 BTC	#2	0.229%
Galaxy Digital Holdings	12,658 BTC	#3	0.060%
Square Inc.	8,027 BTC	#4	0.038%
Marathon Patent Group	4,813 BTC	#5	0.023%
Hut 8 Mining Group	4,724 BTC	#6	0.022%
Coinbase	4,483 BTC	#7	0.021%
NEXON Co Ltd.	1,717 BTC	#8	0.008%
Voyager Digital Ltd.	1,239 BTC	#9	0.006%
Riot Blockchain, Inc.	1,175 BTC	#10	0.006%

This list includes only public companies. Bitcoin held by private companies are not accounted for.

ETHEREUM ANALYSIS

Ethereum Price vs. Trading Volume

ETH soars to all-time highs twice in 2021, ending the year +403% at \$3,715



Data source: CoinGecko

+403%
ETH Price return in 2021

In a year filled with altchains and “Ethereum Killers”, ETH still ended the year on a strong note at **\$3,715** – a whopping **403% year-on-year increase**.

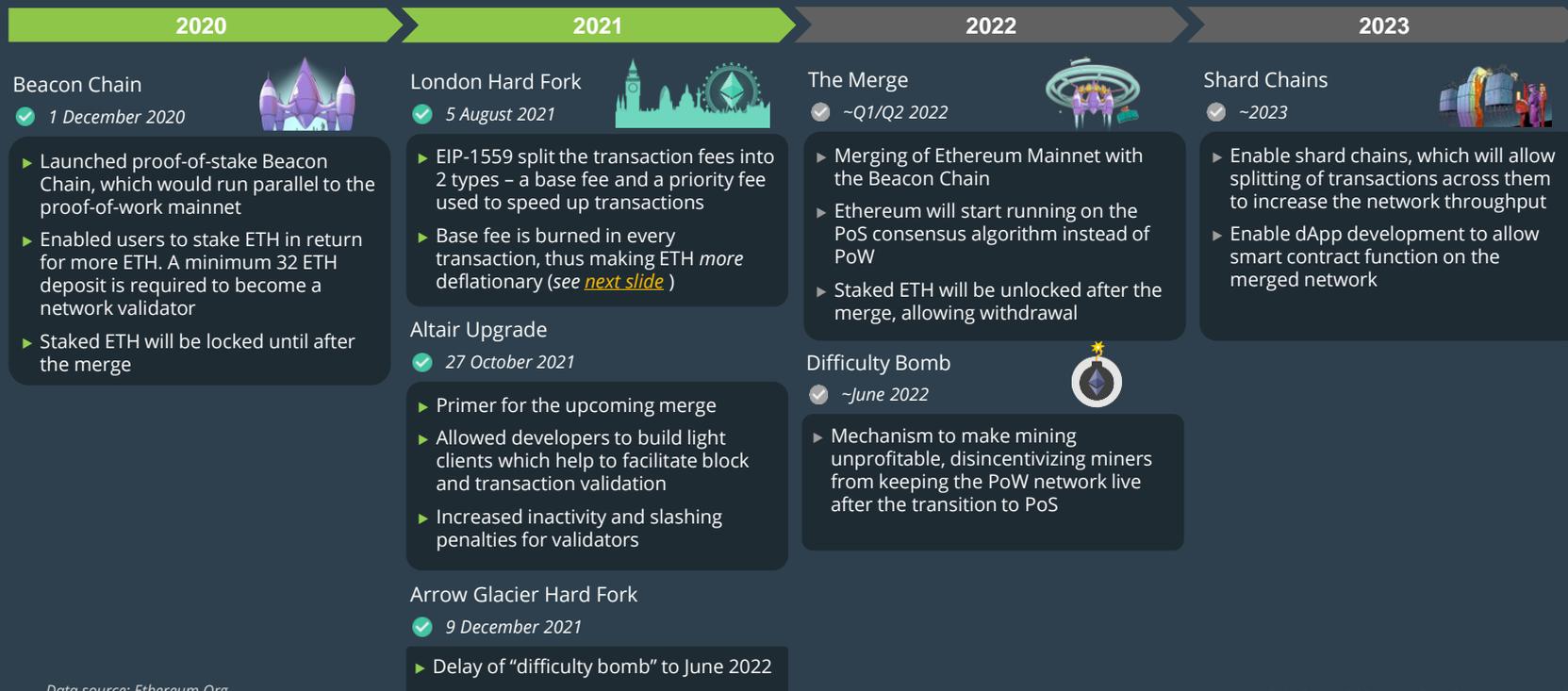
ETH hit its all-time high on two occasions in 2021. The first time was on 11 May when it **broke the \$4,000 mark to close at \$4,183**. After a pullback, it rallied to a **new ATH again** on 9 Nov at **\$4,815**.

- The year was marked by many notable upgrades to the network in preparation for the arrival of ETH2.0 in 2022:
- **London Hard Fork** - Ethereum’s much-hyped network upgrade that consisted of five improvement protocols, with **EIP-1559** garnering the most attention since it **overhauled the entire transaction structure**
 - **Altair** - The first upgrade to the Beacon Chain since its launch in Dec 2020

Ethereum looks primed to finally become a Proof-of-Stake (PoS) chain in early 2022



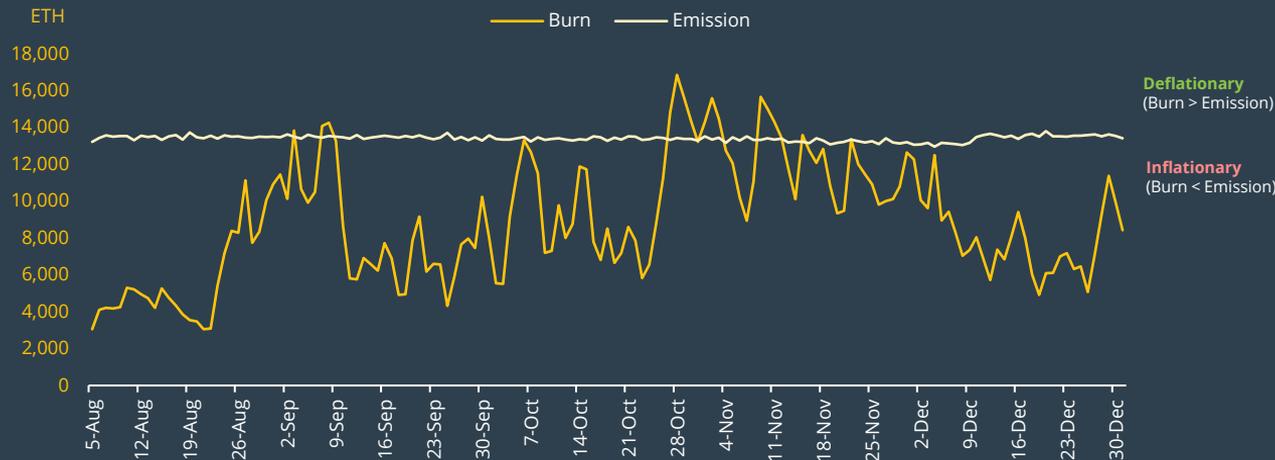
Eth2.0 is a series of upgrades that will transition the Ethereum network into the PoS consensus algorithm, along with the introduction of shard chains. This will enhance the speed, efficiency, scalability and sustainability of the network, enabling it to increase its transaction throughput to ease bottlenecks.



EIP-1559: Burn Rate of ETH since London Fork

EIP-1559 exerts deflationary pressure, but emission of ETH still outpaced burn rate

ETH Burn vs. Emission since EIP-1559 (5 Aug 2021 – 31 Dec 2021)



6.16 ETH 

Average ETH burned per minute in 2021 post EIP-1559

EIP-1559's introduction of ETH burning in each transaction is a precursor to Eth2.0, which will lower the issuance of ETH further, possibly making ETH *even more* deflationary

Issuance of ETH still largely outpaced its burn post EIP-1559, which means that ETH is still an inflationary coin on most days. Its first ever deflationary day came only ~1 month after EIP-1559 on 3rd Sep.

Riding on the wave of "NFT Summer", OpenSea came out on top as the main reason behind ETH burn in 2021, inching ahead of Uniswap V2/V3 and stablecoins (i.e. USDC and USDT).

Top 8 Burn Leaderboard of 2021 

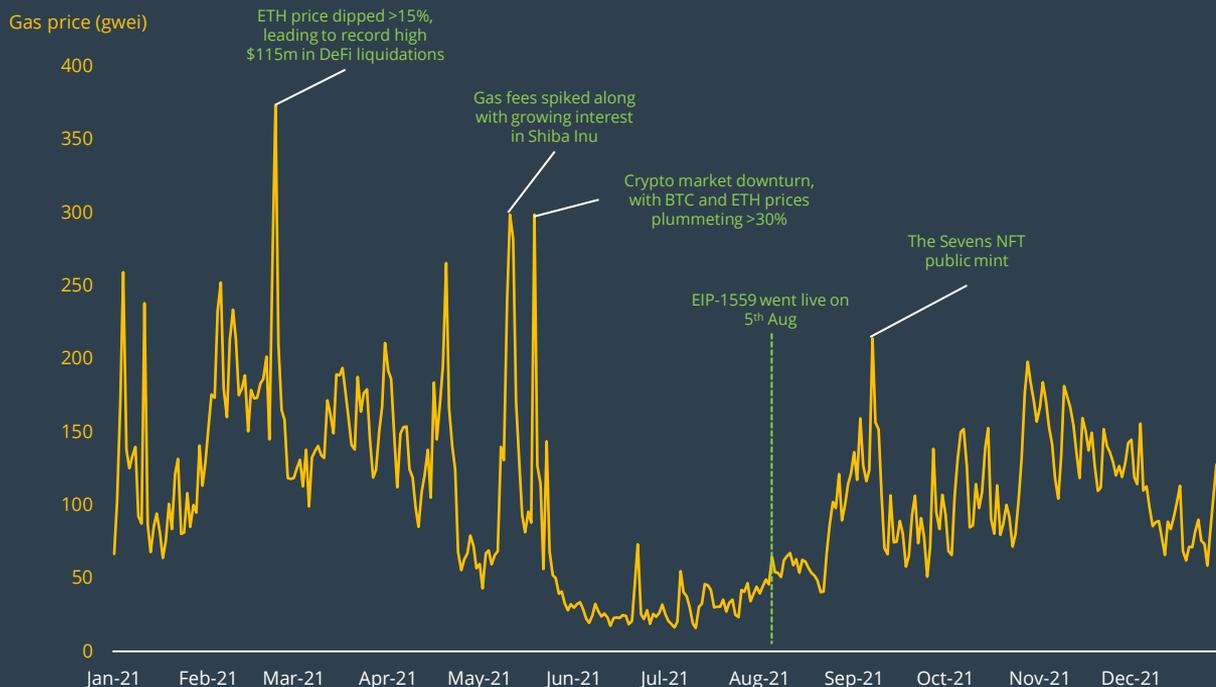
- | | | | | | | | |
|---|---|---|---|---|--|---|---|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| OpenSea
138k ETH | ETH Transfers
126k ETH | Uniswap V2
114k ETH | USDT
69k ETH | Uniswap V3
43k ETH | MetaMask
30k ETH | USDC
27k ETH | Axie Infinity
17k ETH |

Data source: Ethereum via TheBlock, Dune Analytics (@k06a)

Ethereum Average Daily Gas Price

Average daily gas price has stayed above 100 gwei on most days, buoyed by NFT activities

Average Daily Gas Price (Gwei) in 2021



105.2gwei

Average gas fees in 2021

The average daily gas price of 2021 rounded up to **~105 gwei**, with multiple spikes above the 200 gwei mark, hitting an **intra-year high of 373.8 gwei** on 23 Feb.

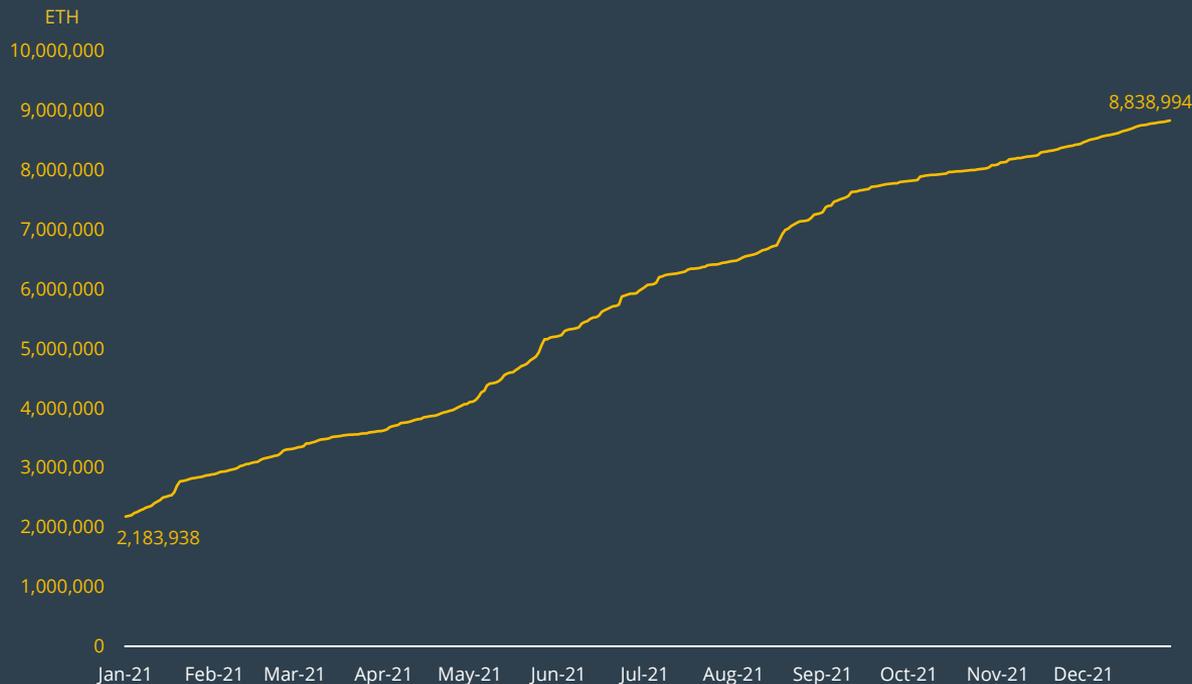
Historically, gas spikes occur during crypto market downturn as users rush to salvage their leveraged positions or to “buy-the-dip”.

Many users expected that the changes brought about by **EIP-1559 would lower gas fees**, but **gas prices continued to climb**, likely due to increased network activity from “**NFT Summer**”

As users clamored to mint the latest NFT drops, it drove up gas prices, which **surged to as much as >5,000 gwei** at one point for The Sevens mint, which would have cost a jaw-dropping ~1 ETH in transaction fees alone.

Eth2.0 staking increased 4x in 2021, with Lido and Kraken leading staking services

Cumulative ETH Staked for Eth2.0 in 2021



+305%

Total Eth2.0 Staking in 2021

Eth2.0 staking had a slow start in its initial launch back in Nov-2020, but quickly trotted into a **steady upward momentum** throughout 2021, increasing **more than 305%** in total staked amount in 2021.

Total staked ETH accounted for 1.91% of the ETH supply in the beginning of the year, **ballooning to 7.49%** by the end of it. Staked ETH will be locked until after “The Merge”, slated to be delivered only by Q2 2022.

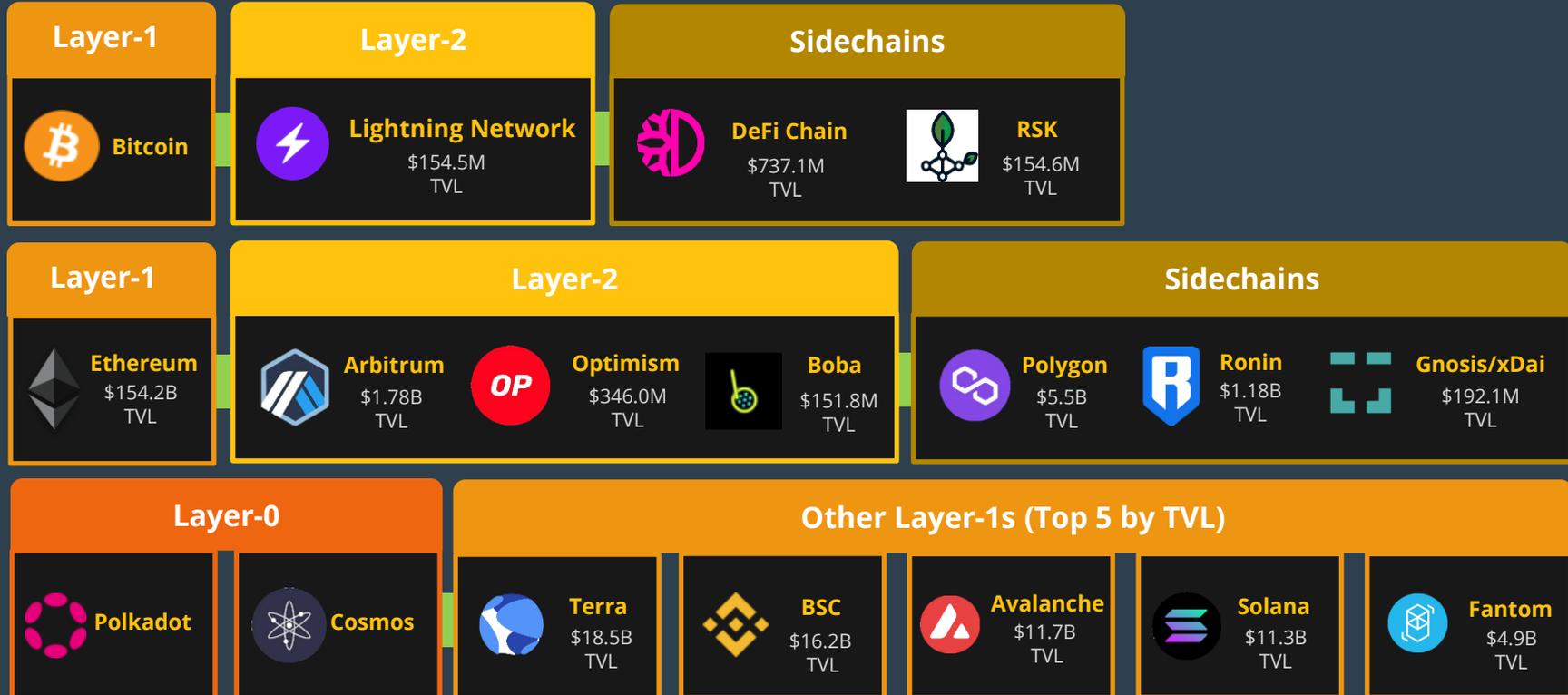
Liquid staking protocol **Lido** in particular quickly gained traction as interest in Eth2.0 built up closer to the launch

By the end of 2021, Lido boasted ~18% of the total staked ETH supply and led the list with **Kraken** as the **top 2 staking services** in validator count.

Altchains Analysis

Overview of Altchains

We have entered into a multichain era



Factors Driving Boom of Altchains

Altchains are an attempt to solve the 'blockchain trilemma'



Every blockchain network has its own set of tradeoffs and must decide which of the three traits (scalability, security, and decentralization) it should prioritize; otherwise known as the '**blockchain trilemma**'. The principle states that only **two out of three traits can be fully fulfilled simultaneously**. The idea originated from a decentralized data storage theorem (CAP) developed by computer scientists in the 1980s.

Key Definitions

- 1 Scalability**
Scalability is the ability to handle a higher volume of transactions.
- 2 Security**
Security is the ability to secure data on the blockchain and prevent it from being tampered with.
- 3 Decentralization**
Decentralization is the level of distribution of control over the network.



Both Bitcoin and Ethereum leverage a Proof of Work (PoW) system that prioritizes security and decentralization **at the cost of scalability**. This is one of the main reasons why Ethereum is transitioning to Proof of Stake (PoS) in Eth 2.0 to improve its scalability.

This is also why altchains are gaining traction (alongside protocol and network incentives) as developers attempt to **build the 'perfect' blockchain ecosystem which simultaneously possesses all three traits**.



Liquidity Incentives

Data Architecture of Chains

Blockchain networks are made up of many different layers

L0s are the **base layer** for other blockchain networks to build upon. L0s allow L1s to leverage both its data and network layers as the foundation for their own blockchain. Through this, L1s will also have **cross-chain interoperability**.

Layer 0

Data Layer

Network Layer

Consensus Layer

Activation Layer

Layer 2

Contract Layer

Application Layer

Layer 1 /
Sidechains

L1s **are the entire blockchain** – they are **responsible for all the key processes** such as consensus mechanisms, coding parameters, computing language, block time etc.

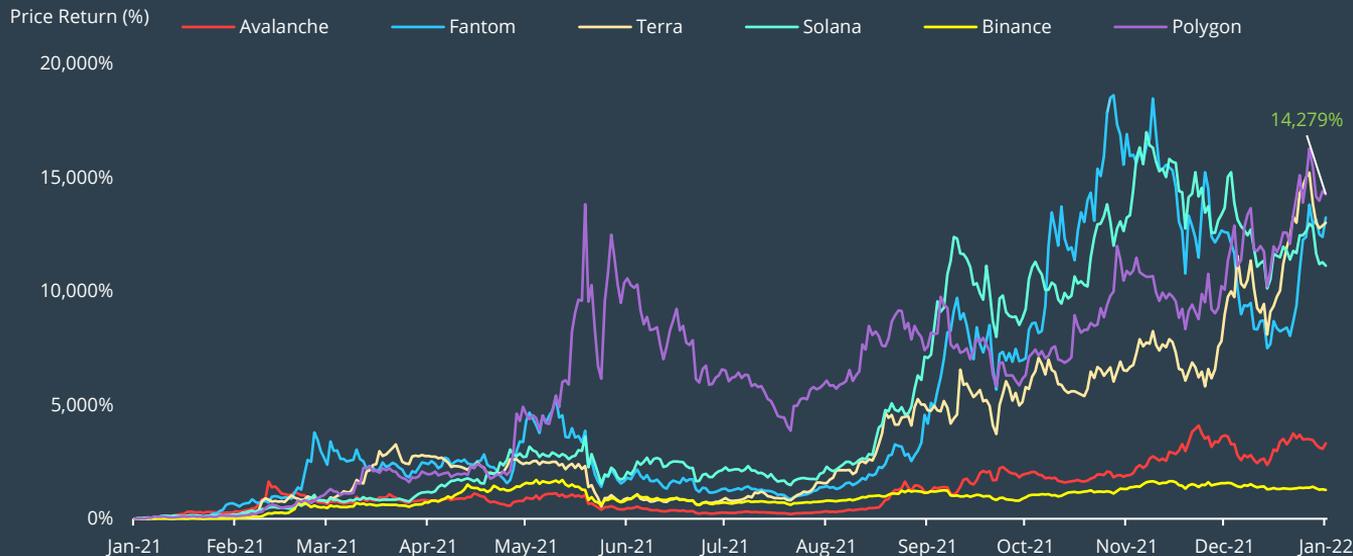
Sidechains **are essentially L1s** that are connected to the primary chain and has similar coding infrastructure but with its own set of rules.

L2s are networks that are built on top of the base layer. L2s allow native protocols to leverage the L1s underlying security mechanisms while conducting transactions on a separate layer; the primary chain will only verify that off-chain activities have been adhered to.

2021 Top 6 Altchain Returns

Altchains have performed exceptionally with Fantom leading the pack

Altchains' Network Token Price Returns (Jan 2021 – Jan 2022)



There is a clear demand for Ethereum/Bitcoin alternatives as users flock to other altchains.

Four tokens have seen **price growths that surpassed 10,000%** over a 1-year period; namely, Fantom, Terra, Solana, and Polygon. Fantom marked the **highest YTD increase at 14,279%**

Other altchains have also seen positive price returns but is no where near the Top 6, all of which is less than 1,000%.

Prominent Projects on Altchains

Altchains are attracting a suite of DeFi protocols and NFT-related products

	 Lightning Pool	 Sphinx	 Lightnite
	 Synthetix	 Lyra	 Uniswap
	 Mirror	 Anchor	 Pylon
	 Raydium	 Solanart	 Orca
	 SpookySwap	 Geist Finance	 Scream

	 Curve Finance	 GMX	 Dopex
	 QuickSwap	 Klima DAO	 Aavegotchi
	 Pancakeswap	 Venus	 Tranchess
	 Trader Joe	 BENQI	 Yield Yak

	L1		L2		Sidechains
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Notable Airdrops in 2021 and Rumored Airdrops in 2022

'Twas the season of gifting for the crypto community in 2021

The cryptoverse once was again blessed by a series of airdrops throughout year 2021, with airdrops from various protocols ranging in worth from a few hundred dollars, to as much as \$100,000 or more. While the crypto community is quick to celebrate “free money”, most airdrops are meant to reward and obtain buy-in from the earliest, most loyal supporters. That said, most of the airdrops were down in price by the end of 2021 since their launch, with even one incident featuring Divergence Ventures sybil-farming RBN's airdrop, the very project they were backing. Here is a (non-exhaustive) highlight of 2021's notable airdrops:-



Rumored airdrops in 2022



-  CowSwap
-  Hop Exchange
-  Element Finance
-  MetaMask
-  BAYC
-  Optimism
-  Arbitrum
-  zkSync

DEFI ANALYSIS

2021 DeFi Overview

DeFi closed out the year with a bang!

DeFi Market Cap and DeFi Share of Overall Market in 2021



+650%

Increase in Total DeFi Market Cap compared to January 2021

In 2021, the DeFi market cap **increased by 7.5x** from \$20 billion to \$150 billion, while its dominance has **more than doubled** from 2.8% to an all-time-high of 6.5%.

The resurgence of DeFi in the final quarter of 2021 may be attributed to a new generation of DeFi products nicknamed **'DeFi 2.0'**. These products seek to **improve the design of the original DeFi protocols**.

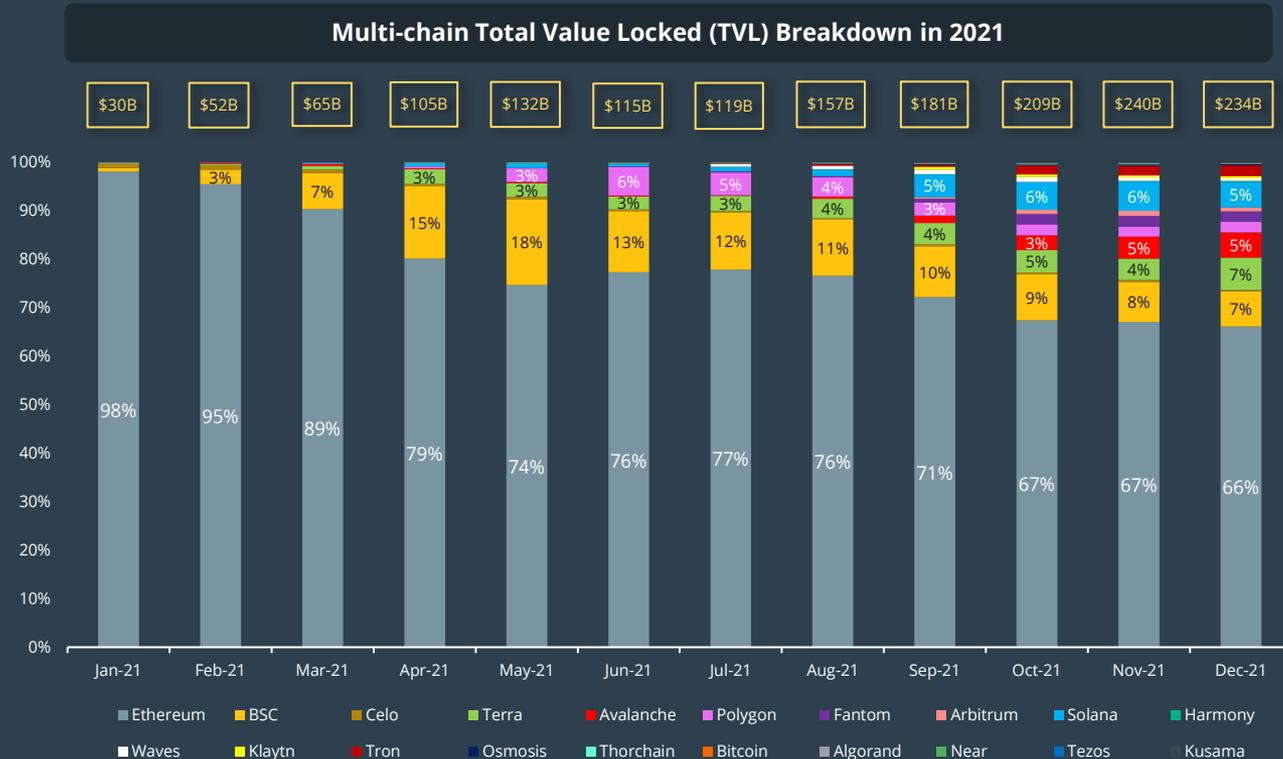
On top of that, the rise of incentives for **new alternative EVM networks** such as Cronos, Aurora and Boba have driven demand for DeFi tokens on these blockchains.

Although the DeFi market cap has retraced towards the end of the year, it reached an **all-time-high of \$174 billion** in November.

Data source: <https://www.coingecko.com/en/defi>

2021 DeFi Multichain Market Share

2021 marked the beginning where DeFi went across different chains



In the first quarter of 2021, **Ethereum** and **Binance Smart Chain** were the dominant chains, securing most of the TVL. However, this quickly changed as the year progressed.

EVM-based networks such as Polygon and Fantom started to gain traction towards the second quarter of the year. These chains became viable alternatives due to their **similarities with Ethereum**, but with **faster transactions and lower fees**.

In Q4 2021, **non-EVM chains** such as Terra and Solana have also grown significantly, **dominating 7% and 5% of total TVL** respectively.

Compared to January 2021, **TVL grew by nearly 8x to \$234 billion** by the end of the year.

As TVL across all platforms continue to grow significantly, Ethereum has managed to **maintain its top position**, but is **slowly losing its dominance**.

Data Source: [DefiLlama](#). Monthly TVL is calculated by taking the average TVL on daily basis for each month

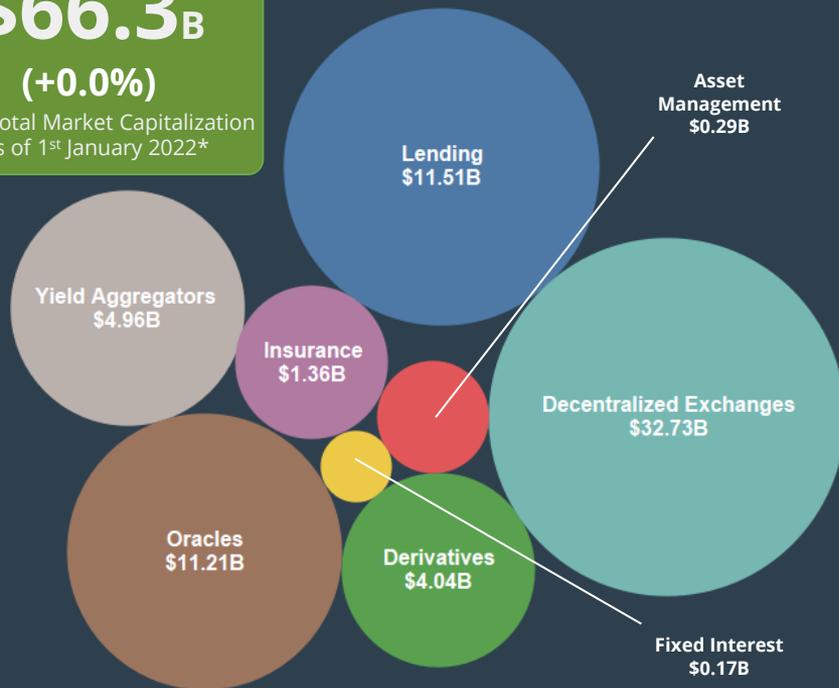
Although most sectors faltered, the DeFi market cap remains relatively unchanged

Market Cap of Each DeFi Category (Oct – Dec 2021)

\$66.3B

(+0.0%)

DeFi Total Market Capitalization
as of 1st January 2022*



Weightage (By 2021 Q4 Market Cap Share)	Sector	QoQ % Change
	Total DeFi Market Cap	0.0%
49.4%	Decentralized Exchanges	-0.3%
16.9%	Oracles	-8.5%
17.4%	Lending	-4.4%
6.1%	Derivatives	-9.0%
7.5%	Yield Aggregators	64.2%
2.1%	Insurance	31.5%
0.4%	Asset Management	-36.7%
0.3%	Fixed Interest	-17.1%

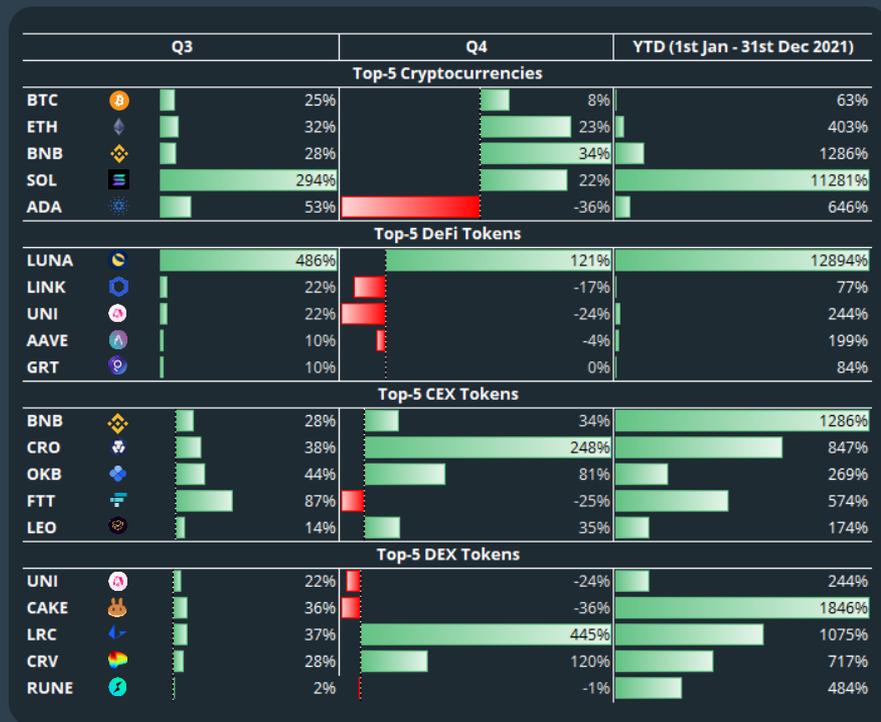
The final months of 2021 saw **little change** in the overall market cap of the DeFi ecosystem. However, market share of its constituents have **clearly shifted** compared to Q3 2021. Heavyweight sectors such as DEXes, oracles and lending platforms **experienced decreases of up to 9%**. Cumulatively, these three segments **shed roughly \$1.5 billion** from the DeFi market cap.

Although most of the DeFi sectors had their **market cap reduced**, the **yield aggregator and insurance sectors** were the **biggest winners** in Q4 2021. The total market cap of yield aggregators itself saw an **increase of approximately \$2 billion**, largely due to Convex Finance and inSure. Convex's market cap **increased by nearly 10x** in the past quarter itself.

Smaller sectors of the DeFi ecosystem saw **even more drastic fluctuations**. Even though the market caps of asset management and fixed interest sectors **plunged by nearly 37%**, it had little impact on the overall landscape.

2021 DeFi Price Returns

Terra enjoys an interstellar year while Solana steals the show.



While DeFi tokens relatively underperformed throughout the year, **LUNA was the primary exception**, achieving a 123% return in Q4, and an **impressive 12,894% increase** year-to-date.

This could be largely attributed to the **Columbus-5 upgrade** on the Terra blockchain as well as the **explosive growth of the Terra ecosystem**, with new protocols such as Astroport and ApolloDAO bringing more use-cases for LUNA.

Solana had a stellar run through 2021, cementing its position as one of the **top 10 cryptocurrencies of the year**. From less than \$2 in January 2021, SOL boasted **more than 112x returns** at the start of 2022.

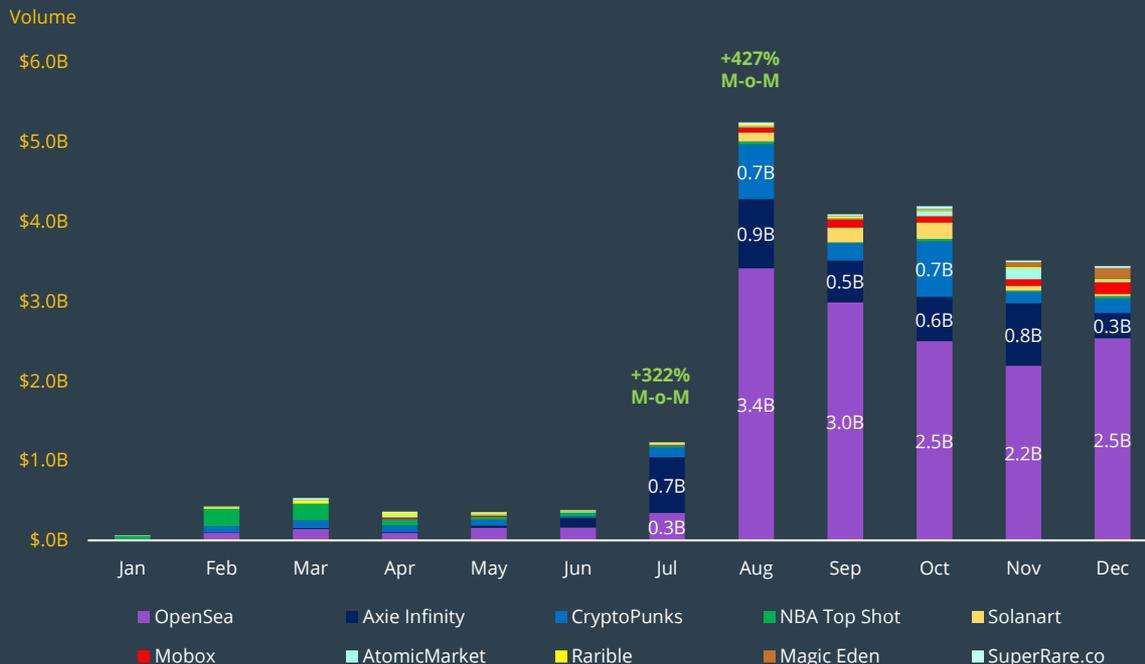
While both CEX and DEX tokens ended the year with incredible returns, the latter had clearly had the upper hand. PancakeSwap, one of the leading DEXes on Binance Smart Chain, **recorded a 1,846% increase** over the year.

Non-Fungible Tokens (NFTs)

NFT Platform Trading Volumes

NFT summer saw a meteoric rise in trading volumes, largely dominated by OpenSea

Top 10 NFT Platform Trading Volume in 2021



\$23.9_B

Total trading volume across Top 10 NFT marketplaces in 2021

+5,438% increase in monthly trading volume (Dec vs Jan 2021)

88% of annual trading volume was contributed by only 3 marketplaces – **OpenSea (61%), Axie Infinity (17%), and CryptoPunks (10%)**. The others in the Top 10 each took up 1-3% of market share.

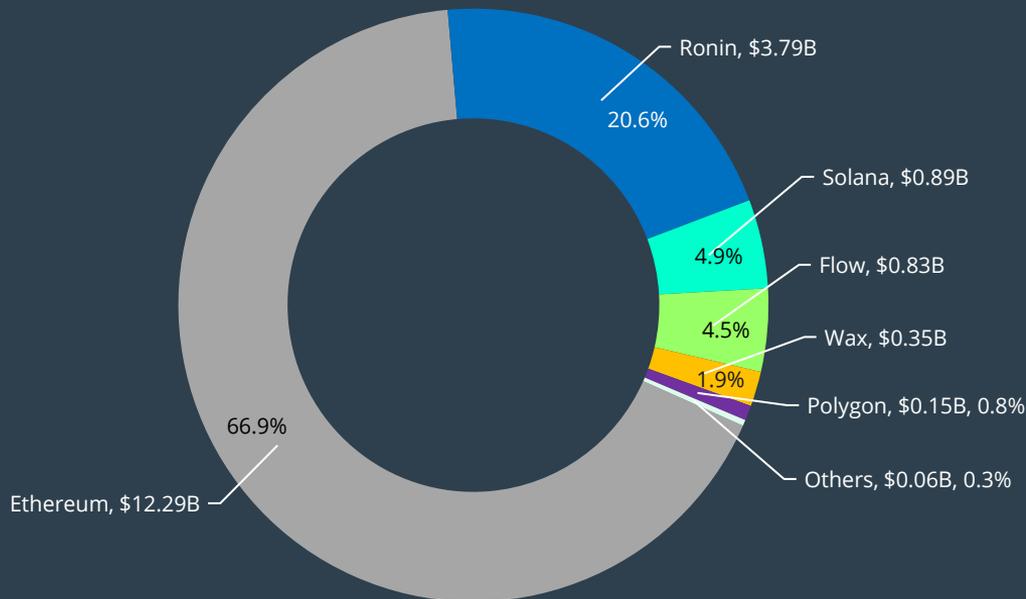
NFT trading volume saw a marked increase in July / August, signaling the start of **"NFT Summer"**.

As the market slowly tapered off, **Axie Infinity lost the most volume**, while smaller marketplaces Mobox and Magic Eden saw gains.

NFT Trading Volume by Chain

Ethereum and Ronin were the clear leaders for NFT trading

Total NFT Trading Volume by Chain in 2021



Ethereum and Ronin were the clear leading chains for NFT trading activity, with a **combined market share of 88%**, largely thanks to OpenSea and the Axie Infinity marketplace.

While NFT Summer largely started on Ethereum, **other L1 chains and sidechains** (e.g. Ronin, Solana, Polygon) **quickly caught on and built their own NFT community**. Similar to DeFi, NFTs on these other chains benefit from faster transactions and lower gas fees. Recently, OpenSea has also started supporting Polygon.

'Others' consist of Panini (\$21m), Tezos (\$16m), Theta Network (\$15m), and BSC (\$5m).

NFT Leaderboards

CryptoPunks hang on as top Collection, while *First 5000 Days* remain most valuable piece

No	Collection	Floor Price (ETH)	Total Sales (USD)
1	 CryptoPunks	62.00	2.41B
2	 Bored Ape Yacht Club	59.97	1.02B
3	 NeoTokyo Citizens	43.74	7.31M
4	 Mutant Ape Yacht Club	11.10	635.02M
5	 VeeFriends	9.24	109.4M
6	 RTFTK - CloneX Mintvial	9.43	102.74M
7	 Cool Cats	7.95	220.46M
8	 Gutter Cat Gang	6.50	69.72M
9	 The Fungible by Pak	6.54	2.2K ETH*
10	 Axie Infinity	0.02	3.8B

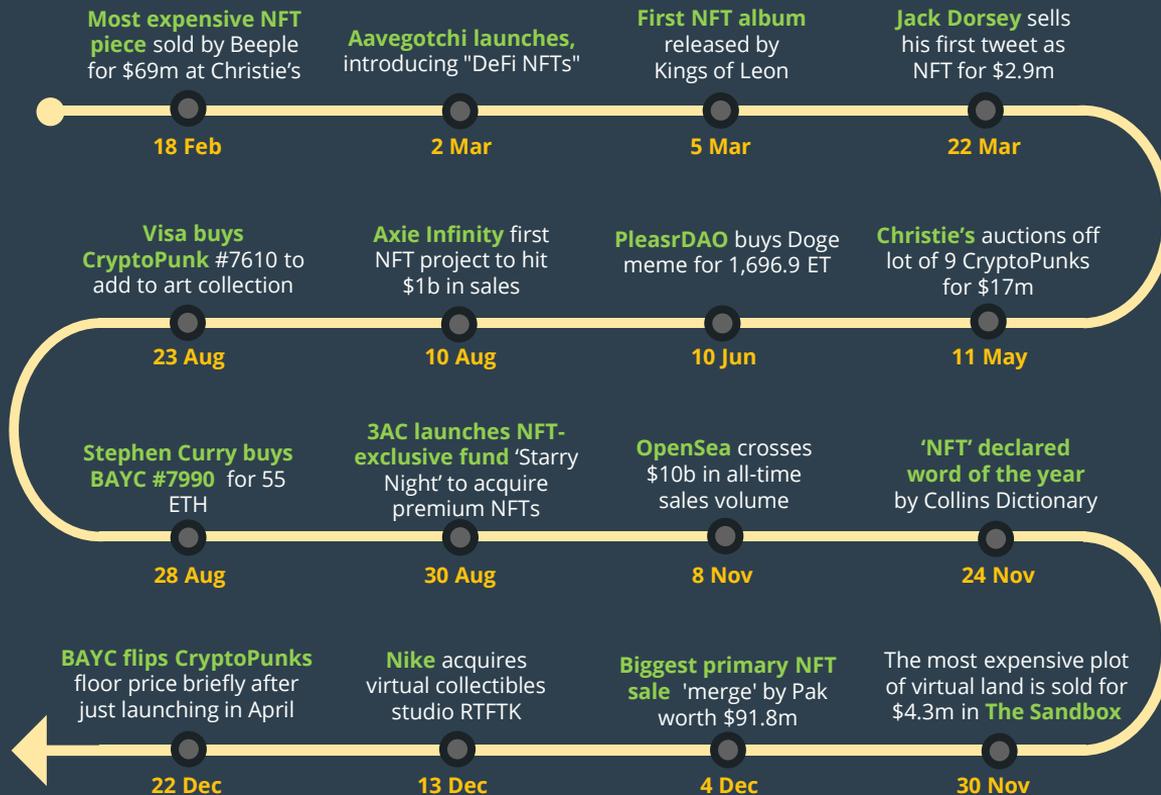
By end-2021, **CryptoPunks retains its position as the collection with the highest floor price**, despite being flipped briefly by BAYC a few days prior. Axie Infinity gets a notable mention as its total sales volume dominates despite its lower floor price.

No.	Artist	Piece	Sale Price (USD)
1	beeple	<i>Everydays: The First 5000 Days</i>	69.35M
2	beeple	<i>Human One</i>	28.99M
3	snowden	<i>Stay Free (Edward Snowden, 2021)</i>	8.29M
4	beeple	<i>Crossroad</i>	6.60M
5	xcopy	<i>All Time High in the City</i>	6.08M
6	beeple	<i>Ocean Front (beeple)</i>	6.00M
7	xcopy	<i>Right-click and Save As guy</i>	5.97M
8	freeross	<i>Ross Ulbricht Genesis Collection</i>	5.39M
9	xcopy	<i>A Coin for the Ferryman</i>	4.96M
10	xcopy	<i>Some Asshole</i>	4.85M

Beeple and XCOPY are tied for the artist with the **most pieces within the Top 10 Highest NFT Sales**, clinching 4 positions each. The two other pieces, *Stay Free (Edward Snowden, 2021)* and *Ross Ulbricht Genesis Collection*, are notably fundraises for causes which share a distinct theme – freedom.

Notable NFT Events in 2021

NFTs were plastered across the headlines in 2021



Aside from Dorsey's first tweet, iconic legacy internet artifacts such as the World Wide Web source code, Doge, Nyan Cat, Disaster Girl, and Overly Attached Girlfriend were also auctioned off as NFTs.

NFTs entered the mainstream big-time this year. Traditional auction houses Christie's and Sotheby's embraced NFTs, holding auctions throughout the year.

Collector DAOs (e.g. PleasrDAO, FlamingoDAO, JennyDAO) emerged, pooling funds to collect culturally significant pieces and democratizing ownership to them.

Big brands from sportswear, fashion, tech and even F&B jumped on the NFT bandwagon -among the names dropping NFT collections include Nike, Adidas, Dolce & Gabbana, Phillips, Budweiser and even Pringles!

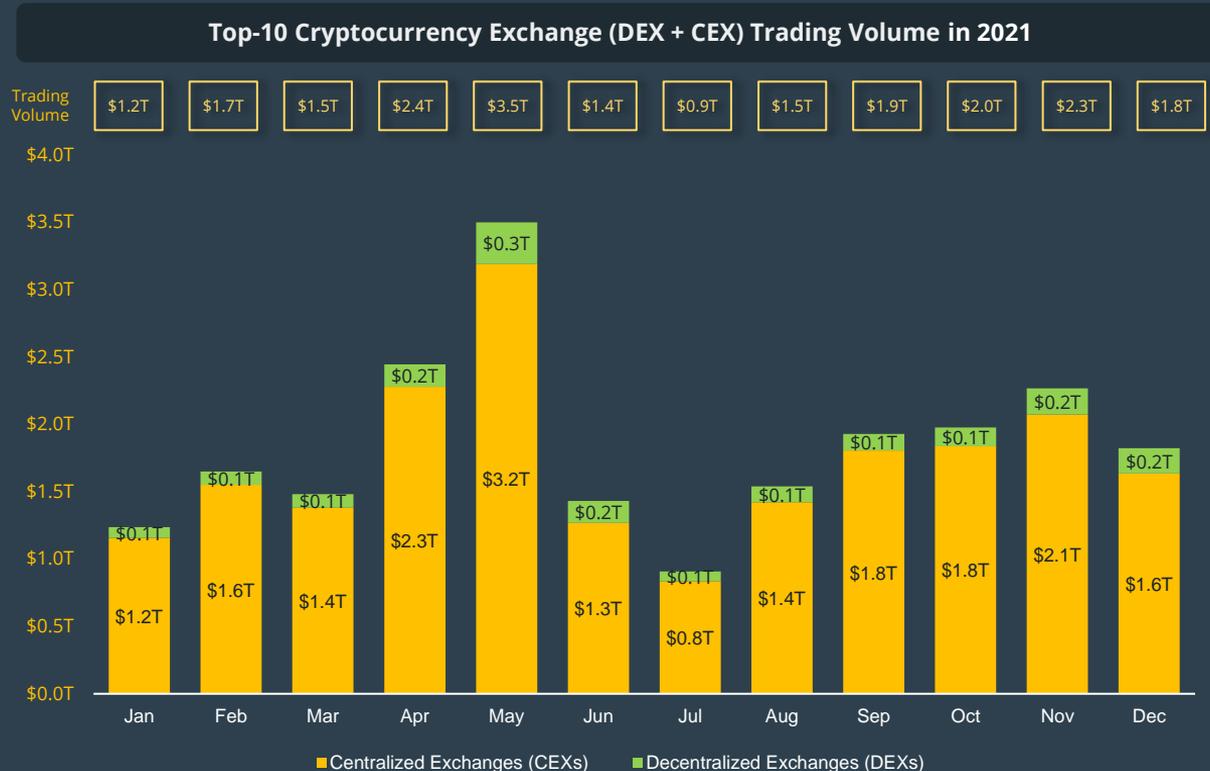
NFTs received no shortage of celebrity endorsements in 2021. Big names such as Snoop Dogg, Grimes, Deadmau5, and Post Malone all added momentum to the NFT hype train.

2021 was also the year of several drops of notable collections e.g., Loot, Pudgy Penguins, Cool Cats, Fidenza, Meebits, and of course BAYC.

EXCHANGES

2021 Top 10 Cryptocurrency Exchanges

Total spot trading volume held steady at average \$1.9T monthly volume



+39%

Top 10 (DEX + CEX) Total Trading Volume Growth from Q3 to Q4 2021

Overall, Q4 spot trading volume across the top-10 centralized and decentralized exchanges **increased from \$4.38 trillion to \$6.1 trillion (+38.57%)**.

Other than an increase in November, **monthly trading volume in Q4 essentially remained at the same levels as September**.

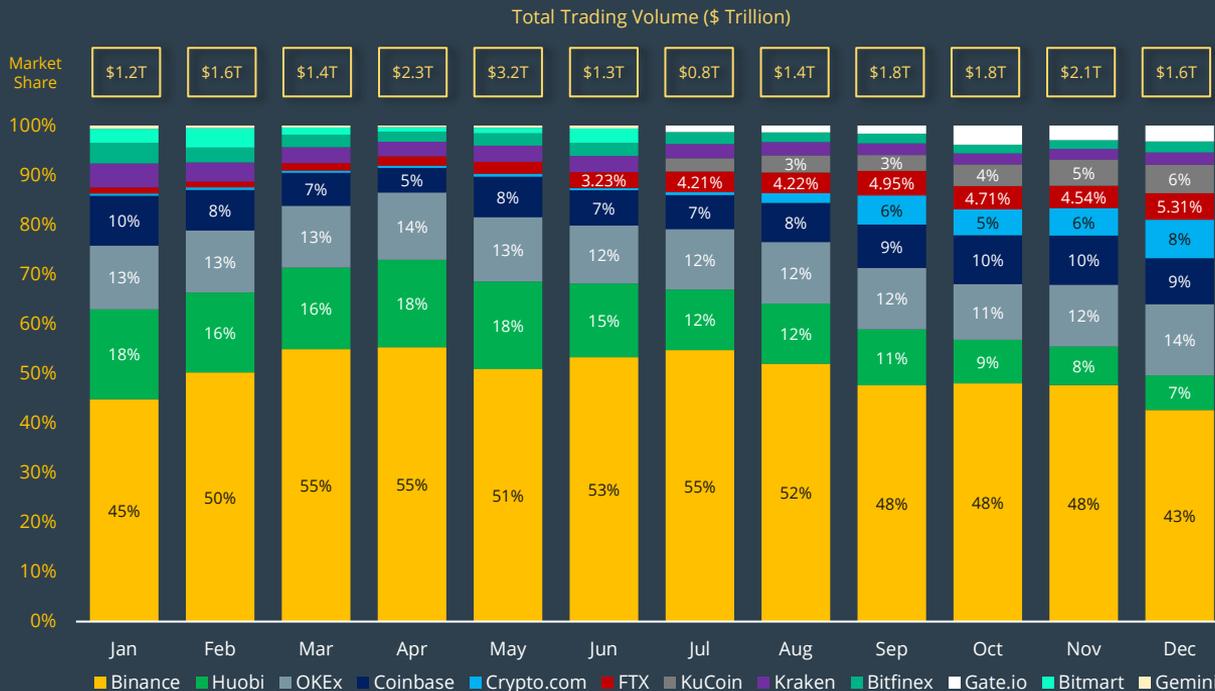
Monthly trading volume in Q4 has been the highest since the run up and subsequent dip in Q2.

Notably, the **DEX:CEX ratio has steadily increased** from 6% at the start of the year to 10%.

2021 Top 10 Centralized Exchanges (CEX)

CEXes trading volume climbed slightly before dipping further in December

Top 10 CEX Trading Volume Breakdown in 2021



+36%

Top 10 CEX Total Trading Volume Growth from Q3 to Q4 2021

Top-10 centralized exchanges recorded a total of **\$5.55 trillion spot trading volume** in Q4 2021. Q4 peaked at \$2.07 trillion in November before falling to \$1.64 trillion in December (-21%).

Binance's market share fell to **42.7% at the end of Q4** as global regulatory scrutiny on the exchange continued.

Huobi's market share shrank by nearly **50% in Q4**, ending the quarter with a 7% share by volume among the top-10 CEXs.

Remarkably, Crypto.com has emerged as the quarter's biggest dark horse, increasing its market share from an average of **0.5% per month in the first half of 2021 to 7.8% in December**.

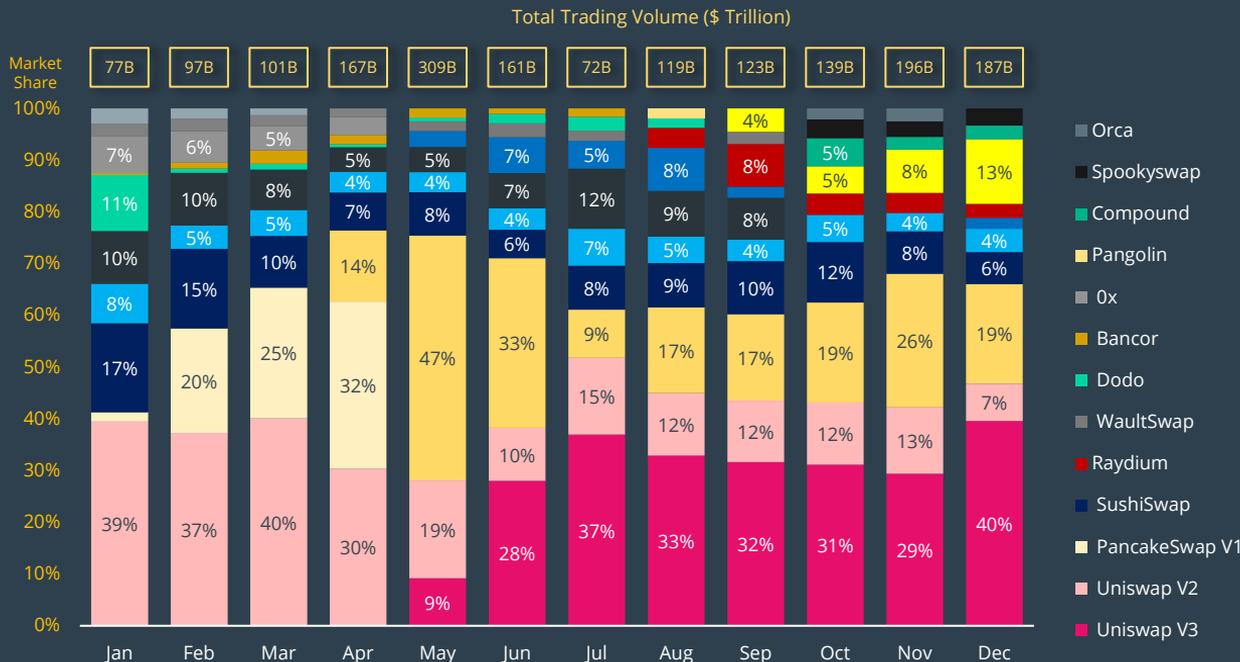
Data source: CoinGecko

Top-10 CEX as of 1 July 2021 – Binance, Huobi, Coinbase, Crypto.com, FTX, OKEx, Kraken, Bitfinex, Bitmart, Gemini
 Top-10 CEX as of 1 January 2022 – Binance, Huobi, Coinbase, Crypto.com, FTX, OKEx, KuCoin, Kraken, Bitfinex, Gate.io

2021 Top 10 Decentralized Exchanges (DEX)

Trading volumes of Top 10 DEXes skyrocketed at the end of the year

Top 10 DEX Trading Volume Breakdown in 2021



+67%

Top 10 DEXes Total Trading Volume Growth from Q3 to Q4 2021

Top 10 DEXes spot trading volume in Q4 2021 recorded a total of \$522 billion in trading volume.

DEXes volumes skyrocketed in November and December where it jumped from \$123B in Sept to \$196B and \$187B respectively.

Uniswap maintained its position as the top DEX (V2 and V3 protocol), with 44.1% market share through out Q4 2021

Since launch, Trader Joe has expanded its market share quickly, while Sushiswap's market share has notably declined.

Data source: CoinGecko

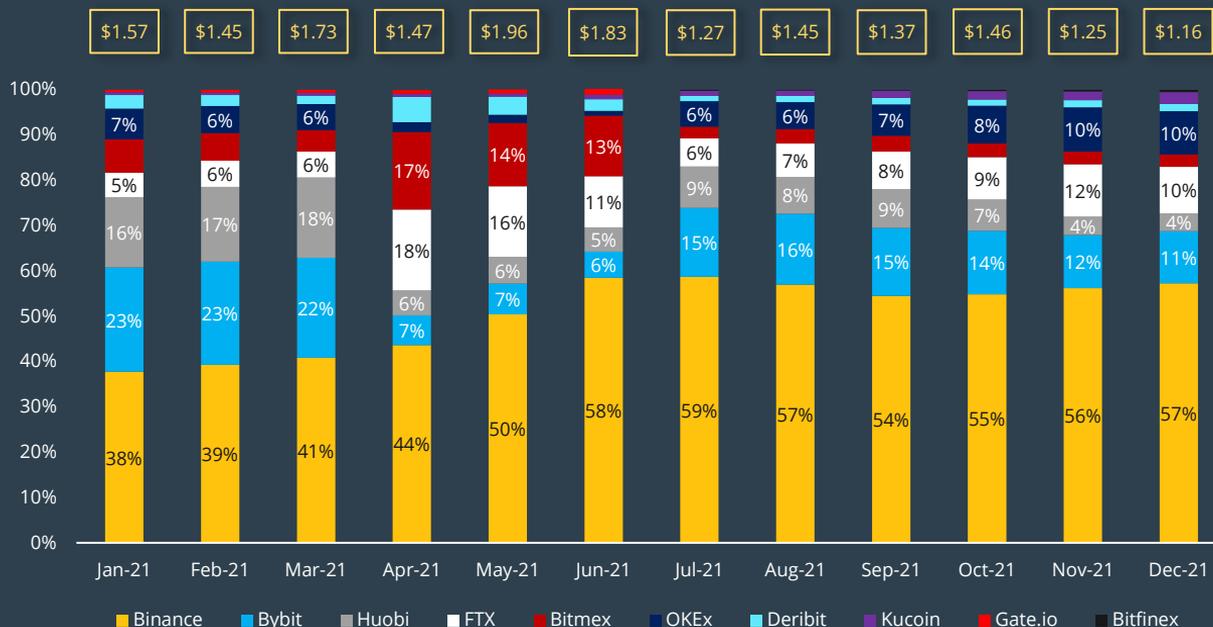
Top-10 DEX as of 1 November 2021 – Uniswap (v3), Uniswap (v2), PancakeSwap (v2), SushiSwap, Trader Joe, Raydium, Curve, SpookySwap, Orca, Compound Finance
 Top-10 DEX as of 1 December 2021 – Uniswap (v3), Uniswap (v2), PancakeSwap (v2), SushiSwap, Trader Joe, Raydium, Curve, SpookySwap, Compound Finance, QuickSwap
 Refer to CoinGecko Quarterly Report Q2 2021 and Quarterly Report Q3 2021 for Top-10 decentralized exchanges rebalances from January to September

Q4 2021 Derivatives Exchanges – Bitcoin Perpetual Swaps Volume

BTC perpetuals saw lacklustre volume in the closing months of 2021

Aggregate Monthly Bitcoin Perpetual Trading Volume Dominance in 2021

Total Trading Volume (\$ Trillion)



-26%
Top-9 Bitcoin Perpetual Swap Trading Vol. Growth in 2021

Trading volume for Bitcoin perpetuals across the top-9 derivative exchanges **plunged further by \$300 billion** in Q4 2021.

Binance slowly **increased its dominance** throughout the year, Huobi **lost a large part of its market share** after the first quarter, making up only 4% of total trading volume by the end of the year. This could be due to the **exchange's decision to suspend its services** for mainland Chinese users.

Although **most exchanges had lower trading volumes** compared to the start of the year, Kucoin and FTX experienced a **207% and 42% rise** respectively.

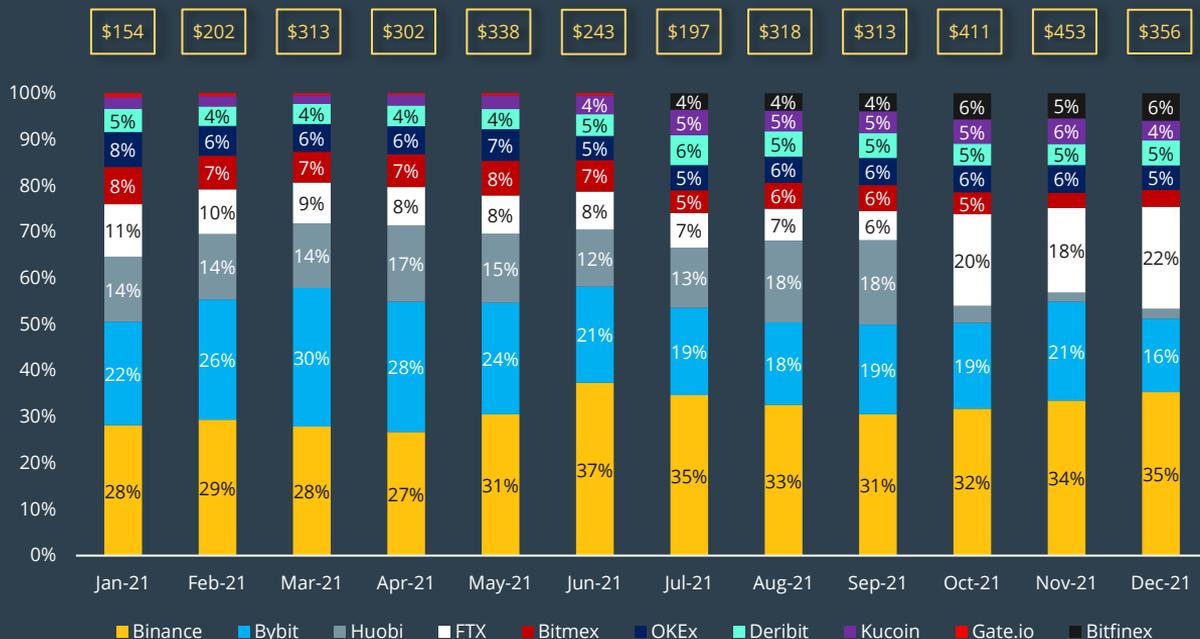
Data source: CoinGecko
Top-9 Derivative Exchanges for Bitcoin Perpetual Swaps as of 1 July 2021 – Binance, FTX, Bybit, OKEx, Gate.io, Kucoin, Deribit, BitMEX, Huobi
Top-9 Derivative Exchanges for Bitcoin Perpetual Swaps as of 1 January 2022 – Binance, FTX, Bybit, OKEx, Bitfinex, Kucoin, Deribit, BitMEX, Huobi

Q4 2021 Derivatives Exchanges – Bitcoin Perpetual Swaps Open Interest

FTX is shaping up to be a solid contender as dominance triples

Aggregate Monthly Bitcoin Perpetual Open Interest Market Share in 2021

Total Open Interest (\$ Billion)



+131%

Top-9 Bitcoin Perpetual Swap Open Interest Growth in 2021

Open interest (OI) across top-9 derivative exchanges **recorded a total of \$1.22 trillion** in Q4 2021.

Throughout the year, the top 4 exchanges **dominated approximately 75% of open interest**.

Binance maintained its market share with the **highest open interest among the exchanges (\$125 billion)**, however FTX has increased its share of open interest by **more than 3x**.

In a similar trend to trading volume, **Huobi's open interest has dropped by nearly half**, while its **market share has decreased by nearly 90%**.

From being one of the top-3 exchanges, it now has the **lowest open interest among the top 9 exchanges**.

Data source: CoinGecko

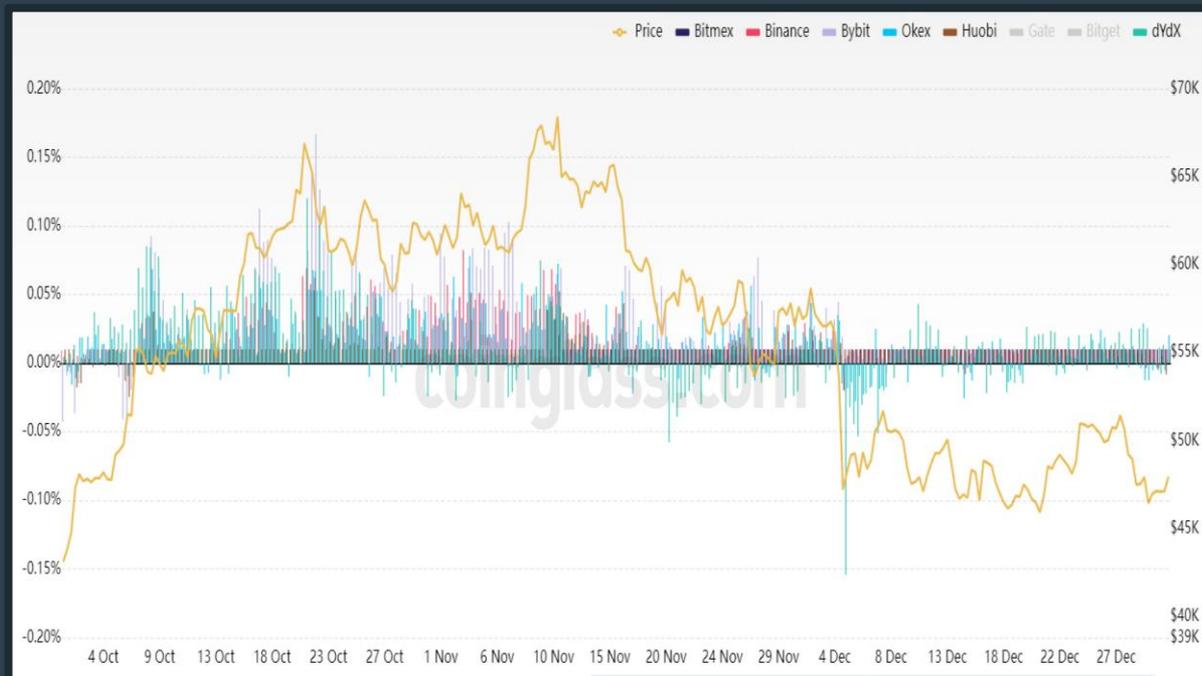
Top-9 Derivative Exchanges for Bitcoin Perpetual Swaps as of 1 July 2021 – Binance, FTX, Bybit, OKEx, Gate.io, Kucoin, Deribit, BitMEX, Huobi

Top-9 Derivative Exchanges for Bitcoin Perpetual Swaps as of 1 January 2022 – Binance, FTX, Bybit, OKEx, Bitfinex, Kucoin, Deribit, BitMEX, Huobi

Q4 2021 Derivatives Exchanges – Bitcoin Perpetual Swaps Funding Rate

Are higher funding rates on DEXes another potential indicator for major price action?

8-Hour USD-Margined Bitcoin Perpetual Funding Rates (Oct – Dec 2021)



0.008% (+1.2 b.p.)

Weighted-Average Bitcoin Funding Rates as of 1st Jan 2022

In Q4 2021, BTC perpetuals on most CEXes were **much more reserved** compared to DEXes such as dYdX.

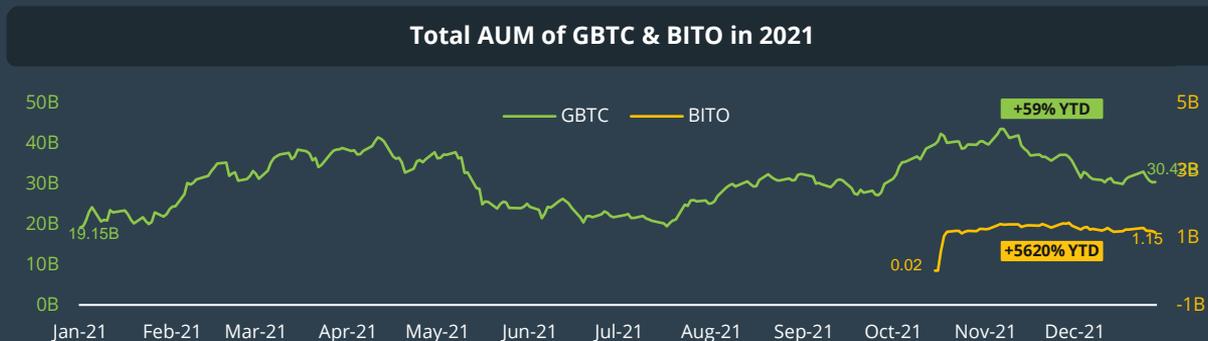
While Bitcoin experienced a second wind on its October run to \$69k, funding rates on dYdX became **increasingly larger on average, reaching as high as 0.12%**.

With higher options for leverage, Bybit's funding rates were still **among the highest** from October to November.

Funding rates were fairly stable before **Bitcoin's plunge to \$47k** on 4 December. The 16% drop resulted in **extremely negative funding rates on dYdX**, breaching below -0.15%

Performance of GBTC and \$BITO

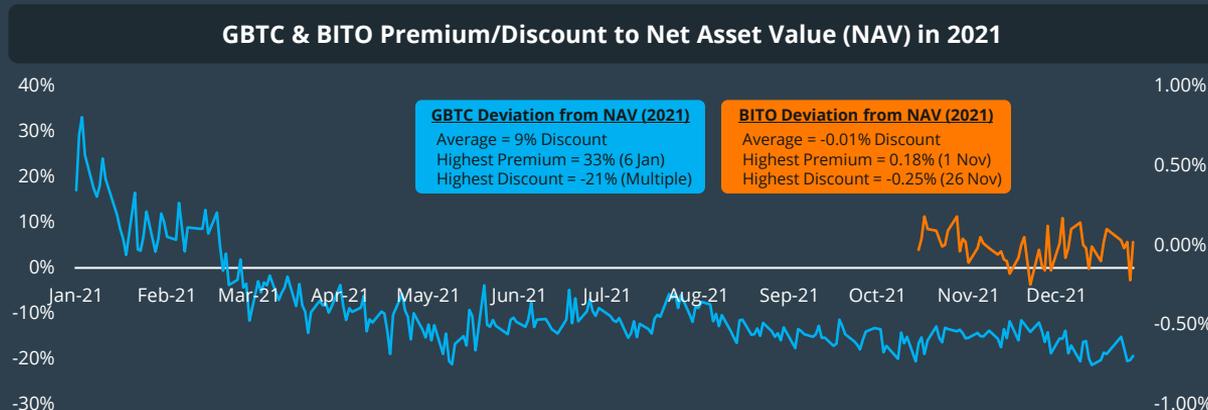
Both assets traced BTC performance; GBTC recorded significant NAV deviation



The AUM of both GBTC and BITO have largely mirrored the price action of BTC, with both ending the year on a positive note of **+59%** and **+5,650%** respectively.

BITO, the first BTC ETF, opened with significant interests from investors on 19 Oct, quickly shooting up to **>\$1B in total AUM** within its **first 4 days** of its launch, and was reportedly at risk of **exceeding the futures-contracts limit**

Soon after, other Bitcoin ETFs such as Valkyrie Bitcoin Strategy ETF and VanEck Bitcoin Strategy ETF also went live.



One of the biggest criticisms of GBTC is its **constant deviation** from Bitcoin's actual value. GBTC was **trading at a premium** to Bitcoin in early 2021, **as high as 33%** at one point. For the **rest of the year** after March, it **traded at a discount** which significantly impacted its return. BITO's deviations were much lower with the highest being 0.25% in the year.

Following in BITO's footsteps, GBTC also filed an application to **convert into an ETF**, which should help close the gaps.



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