BITCOIN'S LIQUIDITY TRIFECTA:

Unpacking Liquidity Across On-Chain Data, Market Microstructure, and Macro Drivers

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Introduction

Bitcoin’s market profile is undergoing a fundamental transformation. What began as a fringe experiment has steadily evolved into a distinct asset class. one that now moves in lockstep with global liquidity, policy cycles, and institutional capital. Regulated channels are replacing informal pathways, derivatives markets reflect increasingly sophisticated positioning, and investor behavior is being shaped more by macroeconomic regimes than by crypto-native narratives. This report, produced jointly by Avenir Group and Glassnode, examines Bitcoin’s evolving role through a three-part analytical framework: on-chain capital flows, market microstructure, and macro-financial integration. Together, these dimensions reveal an asset that behaves not as an outlier, but as a liquidity-amplifying component of the broader risk asset complex.

In the current cycle, institutional access, most notably through spot ETFs and regulated derivatives, has become a defining influence on market structure. With ETF flows demonstrating long-only institutional demand and exchange-level data showing structured positioning, Bitcoin is increasingly being priced as a macro asset, responsive to dollar strength, credit conditions, and changes in risk appetite. This shift has implications not only for digital asset investors, but for global allocators recalibrating exposure across a new generation of investable instruments. Understanding this transformation is critical to navigating the Bitcoin's future trajectory.

Avenir Group

Avenir Group, inspired by the French word for “a better future,” is a globally leading and pioneering investment group specializing in investments in financial innovation and emerging technologies. With deep industry insights, outstanding performance, and self-developed data models and risk management systems, we have maintained a leading position in the Web3 and digital asset space. One of our sub-brands, DeepTrading, focuses on high-frequency trading in the crypto market. Additionally, through Avenir Foundation, we actively promote technology education and innovation.

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Glassnode

Glassnode is the leading market intelligence provider in the digital asset space, primarily focused on institutions. Glassnode's platform delivers unparalleled on-chain analytics, deep insights into BTC, ETH, and selected major digital assets. Founded in 2017, Glassnode equips institutional investors, hedge funds, banks, and asset managers with near real-time, data-driven intelligence, enabling informed decision-making in a highly dynamic trading environment.

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Executive Summary

Welcome to the **Bitcoin's Liquidity Trifecta: Unpacking Liquidity Across On-Chain Data, Market Microstructure, and Macro Drivers**, a comprehensive analysis of Bitcoin's evolving role in global markets through the lens of liquidity co-authored by **Avenir Group** and **Glassnode**.

This report identifies three key dimensions driving Bitcoin's ascent: on-chain dynamics, market microstructure, and macroeconomic linkages — together forming a "liquidity trifecta" that underpins Bitcoin's structural maturation. No longer defined solely by retail speculation or crypto-native metrics, Bitcoin is increasingly shaped by institutional engagement, structural capital flows, and global liquidity cycles. These dynamics mark Bitcoin's emergence as a maturing, standalone asset class.

Key Findings

1. **On-Chain Dynamics:**

   On-chain capital inflows remain a key driver of Bitcoin's strength, with over $544 billion in new capital since late 2022. Consistent daily profit-taking signals sustained investor conviction and reflects a maturing market.

2. **Market Microstructure**

   Derivatives market activity confirms deepening institutional participation. Rising open interest and nuanced microstructure signals reveal increasingly sophisticated liquidity dynamics, indicative of a more advanced market landscape.

3. **Spot Bitcoin ETF Flows**

   Spot Bitcoin ETF flows reflect genuine, long-only institutional demand. Recent inflows suggest strategic exposure by institutions rather than opportunistic basis arbitrage, underscoring Bitcoin's growing legitimacy within traditional portfolios.

4. **Altcoin Divergence**

   Altcoins continue to underperform amid capital concentration. Flows increasingly favor Bitcoin and speculative meme tokens, while mid-tier assets are weighed down by unlock pressures and limited funding opportunities.

5. **Macro Asset Behavior**

   Bitcoin now behaves as a macro asset. Its performance is increasingly tied to global liquidity conditions and traditional market sentiment, diverging from the crypto-native cycles that once defined its market activity.

We hope you find this report insightful and that it helps deepen your understanding of Bitcoin's evolving role in global financial markets. Thank you for your interest, and we invite you to explore the report further—enjoy the read!

Kelly Ye

Kelly Ye
Deputy Chief Investment Officer, Avenir Group

On-Chain Liquidity Measures

Bitcoin Price Performance

Bitcoin performance tracks previous cycles despite increased size

Bitcoin, the premier digital asset, has undergone a marked period of maturation in recent years, with its global reputation rising significantly. A key indicator of this evolution is the surge in institutional adoption, catalyzed by the introduction of U.S. Spot ETFs, which many analysts consider the most successful launch in ETF history.

Additionally, Bitcoin has gained significant traction at the nation-state level. Notable examples of this include the Kingdom of Bhutan launching large-scale mining operations, El Salvador adopting Bitcoin as legal tender and integrating it into its national payment infrastructure, and most notably, the U.S. government identifying Bitcoin as a potential strategic reserve asset. The combination of these factors continues to shape Bitcoin into an asset which is increasingly intertwined with the state of the macroeconomy.

When assessing the performance of Bitcoin from the low of each cycle, a starkly similar performance can be observed.

- **2015-18 Current Performance:** +1059%
- **2018-22 Current Performance:** +1007%
- **2022+ Current Performance:** +656%

It is remarkable that Bitcoin continues to track closely with previous market cycles, especially given its significantly larger market capitalization today. This suggests that demand is scaling in line with the asset's growth, reinforcing its evolving market depth and maturity.

Bitcoin: Price Performance Since Cycle Low

Data Source: Glassnode

Realized Cap

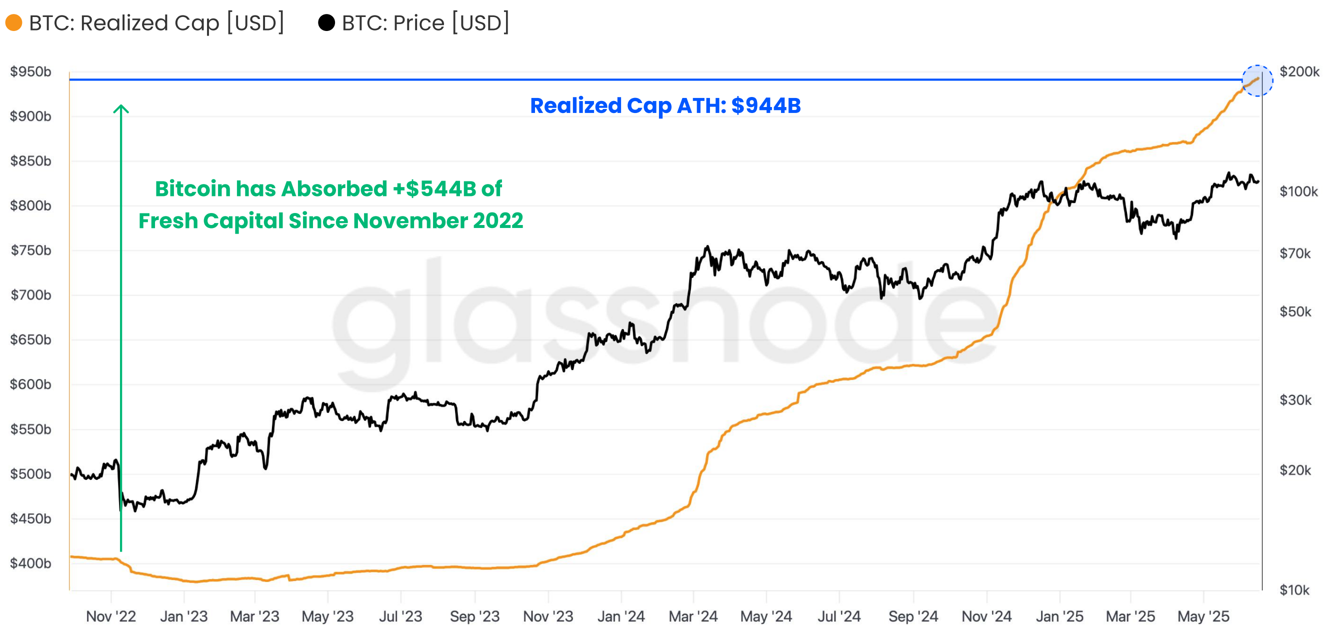
Bitcoin's network liquidity stands at all time highs

With the Bitcoin ledger being both transparent and verifiable, we can price-stamp transactions and determine whether coins are being transacted at a profit or a loss. Due to Bitcoin's peer-to-peer nature, a sale at a profit implies the buyer acquires coins at a premium to the seller's cost basis, which is interpreted as a capital inflow. Conversely, when coins are sold below their acquisition cost, the buyer acquires them at a discount, constituting a capital outflow.

By aggregating all profit- and loss-taking events since the network's inception, we can derive the Realized Cap, a metric that reflects the net USD-denominated capital invested in Bitcoin over time. As Bitcoin continues to mature into a globally traded asset, which is highly sensitive to shifts in global liquidity, its Realized Cap increasingly serves as a bellwether for capital allocation trends and broader macroeconomic liquidity conditions.

Since the cycle low in November 2022, Bitcoin has absorbed over +$544B in fresh capital inflows, pushing its internal network liquidity to an all-time high of $944B. Now approaching a $1T valuation, this milestone underscores both the sheer scale of the asset and its rising significance on the global financial stage.

Bitcoin: Realized Cap



Data Source: Glassnode

Net Realized Profit/Loss

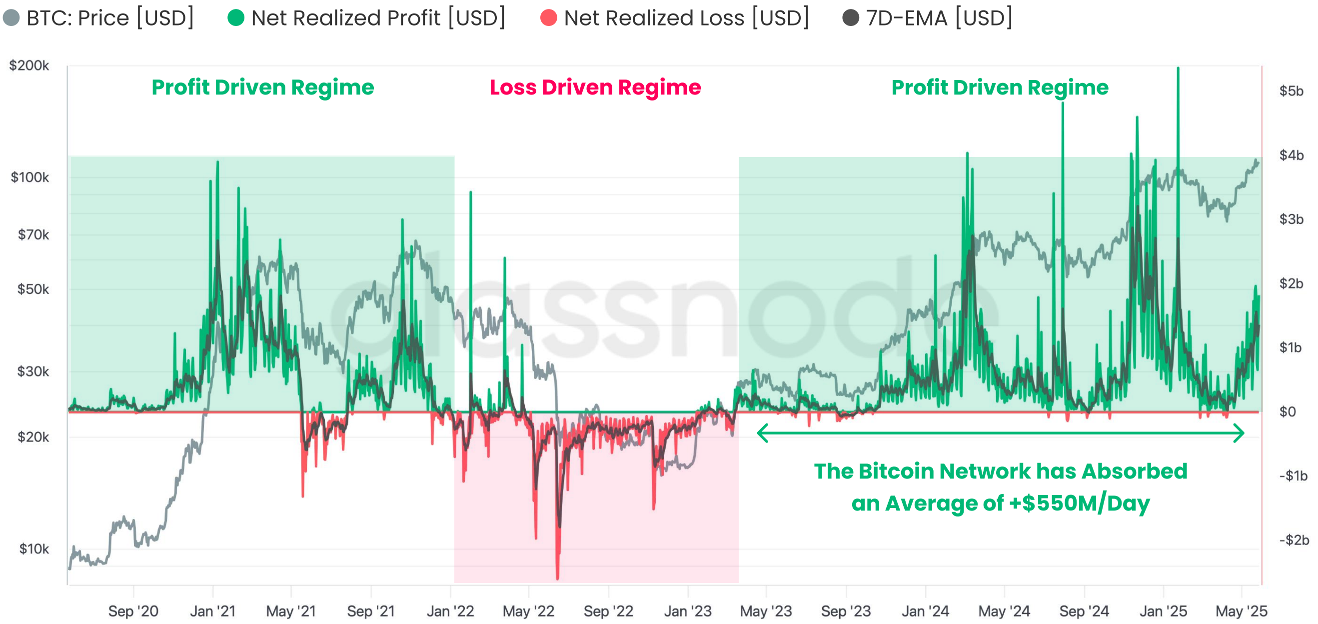
Bitcoin has maintained a regime of capital inflows since March 2023

With the Realized Cap representing the cumulative USD liquidity invested in an asset since inception, its first derivative—the Net Realized Profit/Loss metric—captures the magnitude of net capital flows entering or exiting the asset on a given day. This enables a discrete, daily measurement of changes in network liquidity.

Notably, Bitcoin has remained in a profit-dominant regime since March 2023, with profit-taking activity consistently outweighing losses.

Since that point, the network has absorbed an average of +$550M per day in new capital inflows. As shifts in liquidity are widely recognized as a primary driver of an asset's valuation, these persistent and substantial inflows have been a key force behind Bitcoin's price expansion, culminating in multiple new all-time highs this cycle.

Bitcoin: Net Realized Profit/Loss



Data Source: Glassnode

Off-Chain Liquidity Measures

Exchange Inflows and Outflows

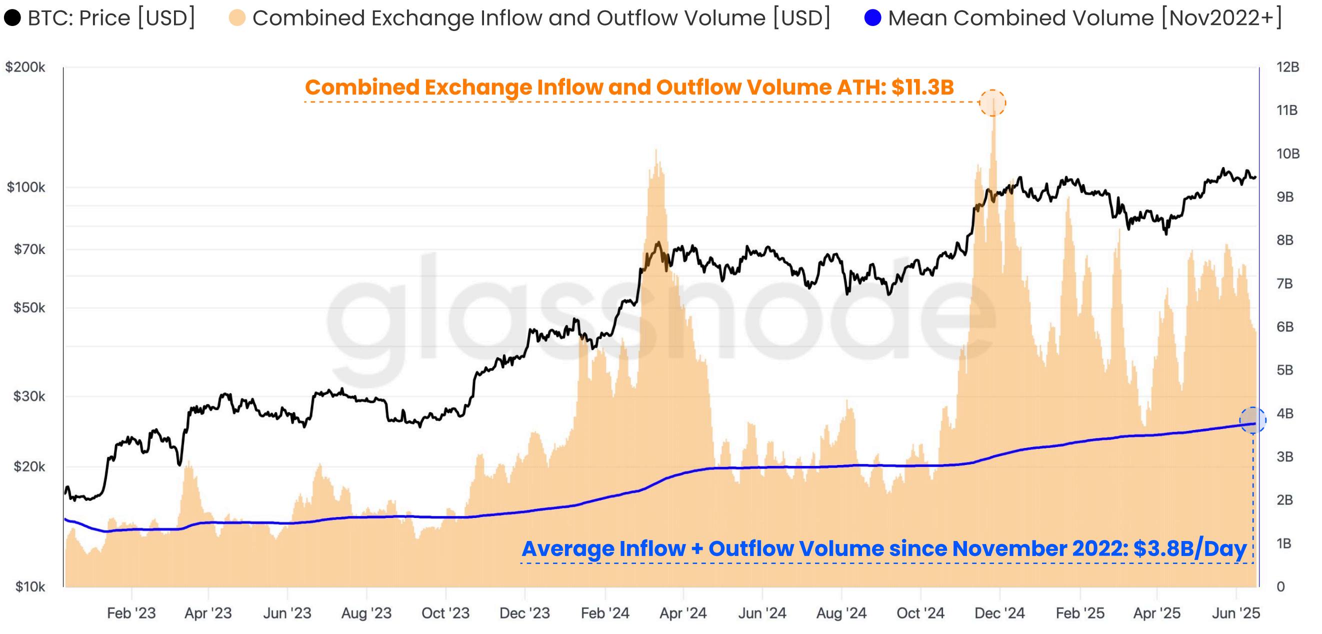
Exchange flows demonstrate increasing investor engagement

In the previous section, we examined how liquidity revolves around the Bitcoin network through on-chain activity, providing an essential yet partial view of the asset's economy. To develop a more comprehensive understanding of market liquidity, we must also consider off-chain dynamics.

Centralized exchanges (CEXs) play a pivotal role in this landscape, enabling large-scale trading across a vast array of digital asset pairings. With billions of dollars transacted daily, CEXs serve as the primary venue for investor speculation and price discovery. These platforms aggregate the most informed, capitalized, and active market participants, making them the central venues for establishing fair market value.

With the importance of centralized exchanges established, the volume of capital flowing into and out of these venues serves as a strong proxy for investor engagement and trading activity. Throughout the 2022 cycle, total exchange inflows and outflows in USD terms peaked at an impressive $11.3B in a single day, with a daily average of $3.8B. These substantial volumes reflect a maturing and highly developed trading ecosystem, underpinned by robust infrastructure and deep liquidity, both hallmarks of an increasingly institutionalized digital asset market.

Bitcoin: Combined Exchange Inflow and Outflow Volume [USD]



Data Source: Glassnode

Futures and Options Open Interest

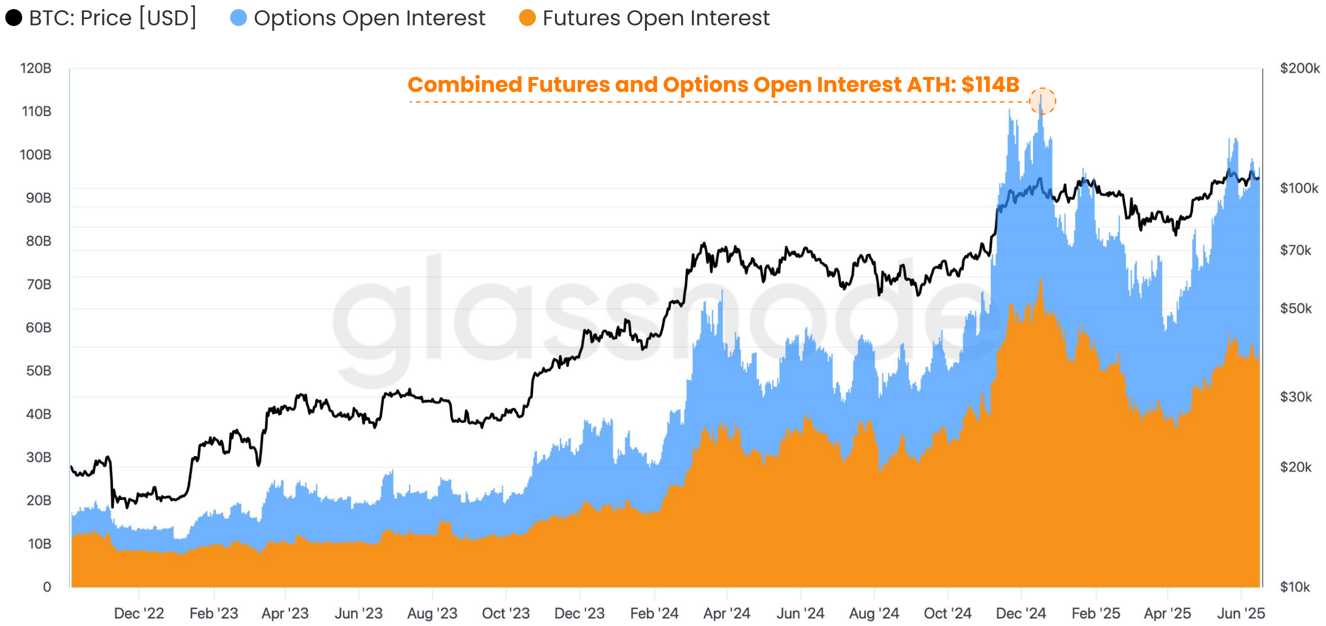
Derivatives open interest growth reflects maturing market

Turning to derivative markets on centralized exchanges, open interest across both futures and options contracts for Bitcoin has exhibited consistent and structured growth throughout the current cycle, rising from just $11.1B in December 2022 to a staggering $114B at the time of Bitcoin's initial $100k breakout.

As derivatives become a core component of market activity, they not only enhance capital efficiency and strategic flexibility but also significantly deepen market liquidity. Zooming in on the futures market, futures open interest climbed from a cycle low of $7.7B in December 2022 to an all-time high of $71.7B, reflecting growing participation from both retail and institutional traders.

Meanwhile, options open interest surged from $3.4B to a record $46.7B, underscoring a maturing investor base that is increasingly employing advanced strategies to manage risk and refine positioning. Taken together, these developments in derivatives markets illustrate the increasing depth, complexity, and professionalism of the Bitcoin ecosystem.

Bitcoin: Futures and Options Open Interest



Data Source: Glassnode

Limit Order Book Imbalance

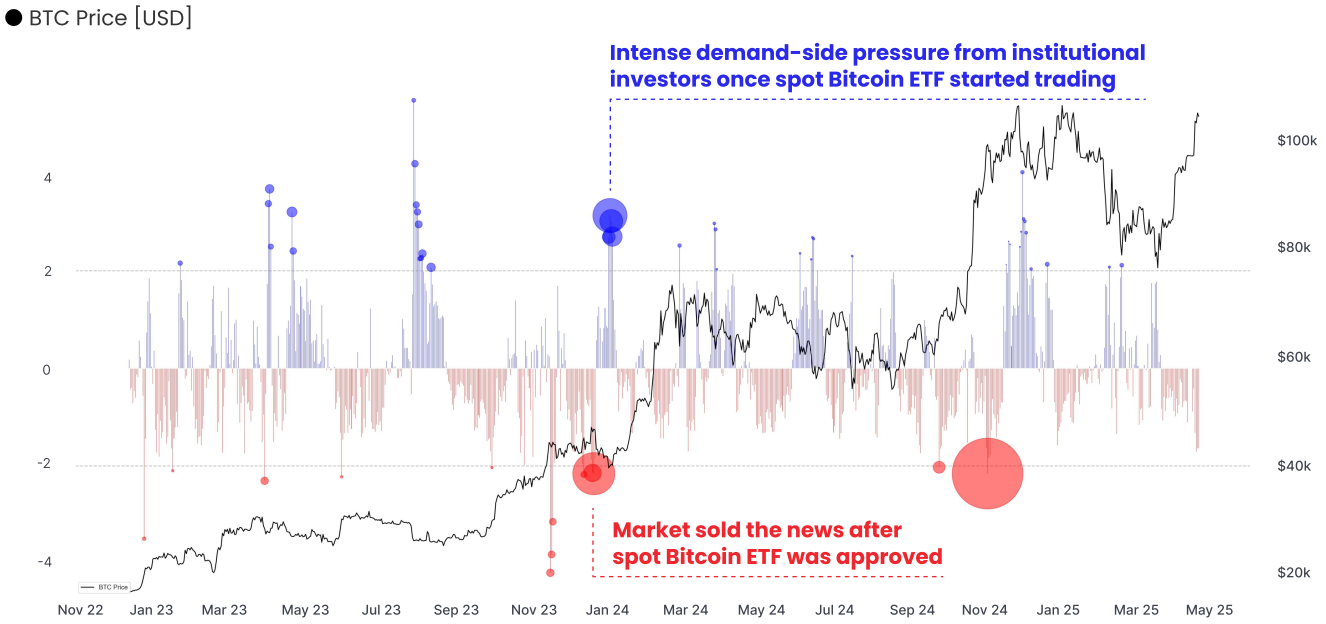
Limit order book imbalances led several market inflections

Additionally, we can assess the limit order book (LOB) on centralized exchanges, which contains a wealth of information about liquidity dynamics. By applying a robust, data-driven methodology, we analyze the spot LOB for Bitcoin within a ±10% price band and compute a normalized imbalance using a 60-day rolling z-score.

Statistically significant deviations, particularly beyond ±2 standard deviations, often coincide with major supply-demand dislocations and have historically aligned with shifts in market sentiment and turning points in Bitcoin's price action. In the accompanying chart, the size of the dots represents the absolute magnitude of imbalance, capturing the strength of either buy- or sell-side pressure. This framework surfaced several notable inflection points:

1. **Late 2023:** Marked by strong sell-side pressure, consistent with widespread profit-taking ahead of the anticipated spot Bitcoin ETF approval.
2. **January 2024:** Following the ETF launch, a sharp surge in buy-side imbalance emerged, signaling institutional accumulation and fresh capital inflows.
3. **Late 2024:** As Bitcoin approached the $100,000 milestone, extreme sell-side pressure reappeared, aligning with peak profit realization.
4. **March 2025:** The most recent rally began with a statistically significant buy-side imbalance, absent any major sell-side resistance, echoing the accumulation-driven regime seen between March and September 2024, and hinting at a potential return to range-bound consolidation.

Bitcoin: Spot Orderbook Imbalance



Data sources: Avenir Group, Binance

CVD Divergences

Perpetual CVD demonstrates speculative flows still significant

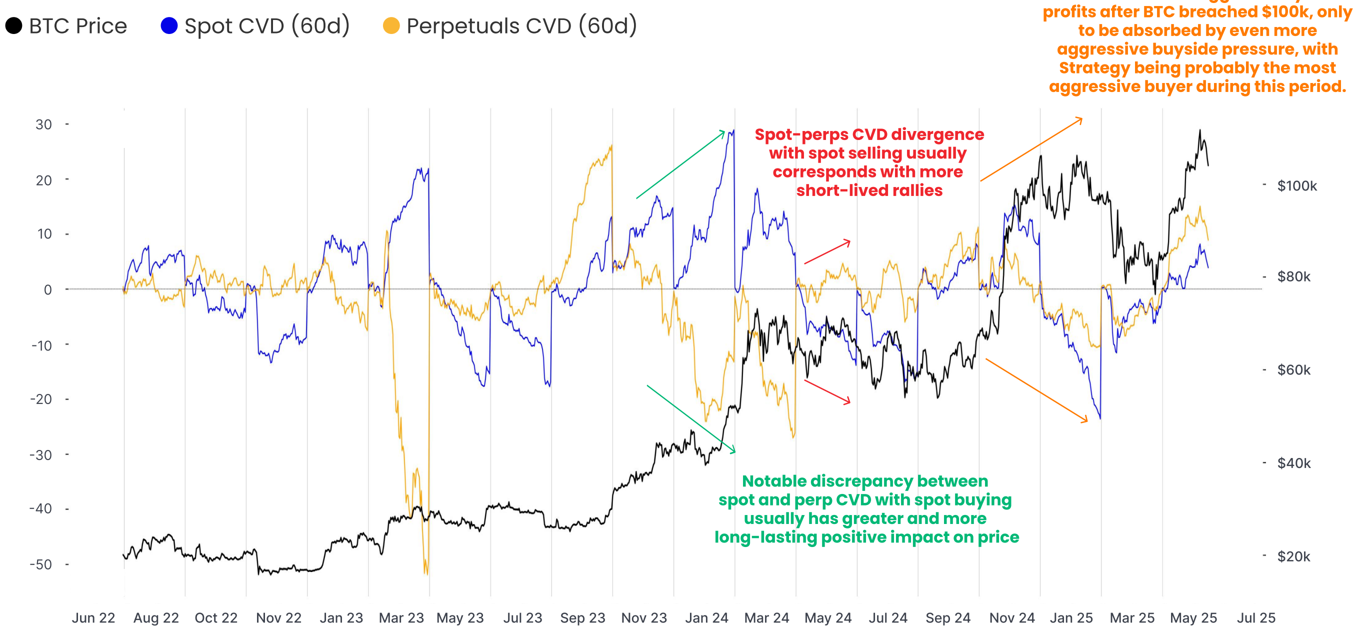
Another tool we can employ to assess liquidity imbalances is the Cumulative Volume Delta metric, which is a powerful microstructure-based indicator that captures the net aggressiveness of market participants through market orders. Unlike passive interest in the limit order book, CVD reflects active intent, revealing whether buyers or sellers are more willing to cross the spread and take liquidity.

To isolate for regime-specific behavior, we apply a rolling 60-day CVD reset, allowing for clearer interpretation of structural trends and short- to medium-term liquidity dynamics. Notably, two forms of CVD divergence have proven especially informative:

1. **Spot–Perpetuals CVD Divergence:** When spot CVD dominates, it typically reflects genuine demand and tends to have a sustained positive impact on Bitcoin price even if perpetuals CVD is declining. In contrast, when perpetuals CVD dominates during periods of spot selling, it tends to indicate speculative positioning and signals that rallies may be short-lived.
2. **Spot CVD–Price Divergence:** In late 2024, both spot and perpetual CVD, but especially spot, diverged meaningfully from price. This suggests that the aggressive sell pressure was being absorbed by strong demand from limit order books. Much of this absorption was attributed to continued strategic Bitcoin accumulation by MicroStrategy (now renamed Strategy), highlighting the role of deep passive buy-side liquidity in overpowering the active sell pressure and ultimately reinforcing the uptrend.

In the ongoing rally that began in late April 2025, we have not yet observed a meaningful CVD divergence. However, perpetual CVD is currently leading, indicating that speculative flows are playing a larger role than spot-driven accumulation. This distinction is crucial when evaluating the sustainability of the current move and the extent to which institutional capital is meaningfully engaged.

Bitcoin: Spot vs Perpetuals CVD Divergence



Data sources: Avenir Group, Glassnode

Unhedged Spot Bitcoin ETF Demand

Spot Bitcoin ETF flows suggest authentic institutional demand

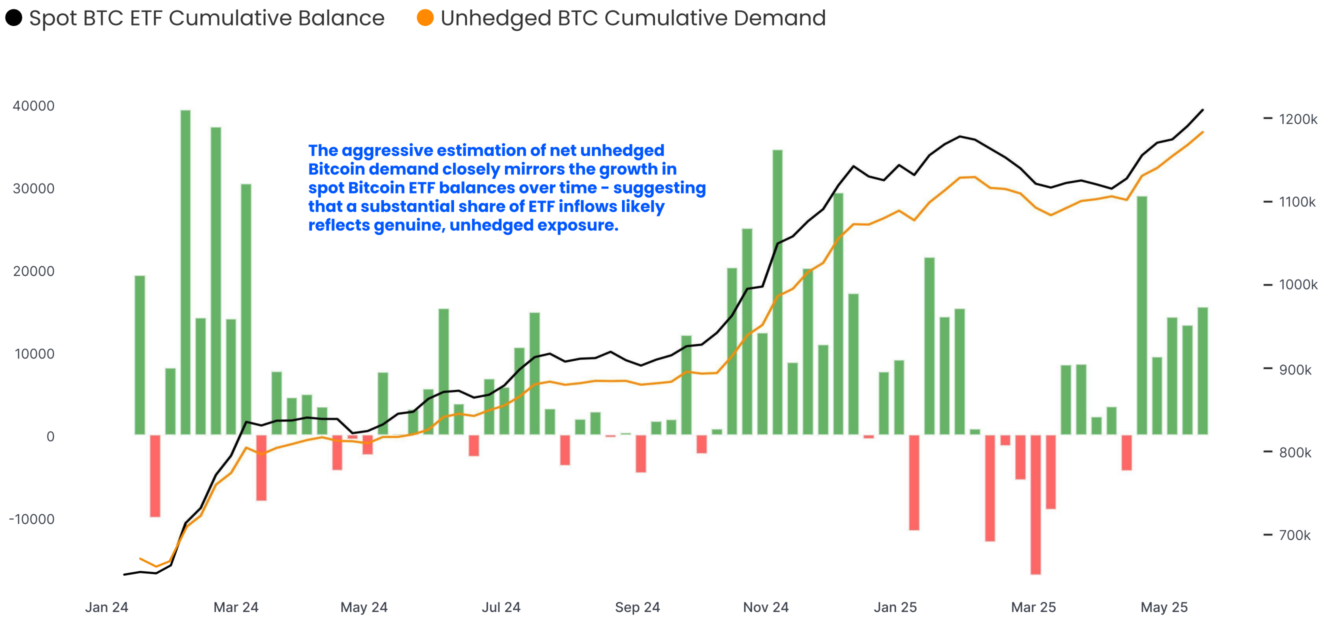
The advent of US Spot ETFs for Bitcoin marked a crucial step in the asset's maturation, with the instruments serving as a critical on-ramp for traditional financial institutions seeking regulated and transparent exposure to the cryptocurrency.

To better understand the true institutional demand for Bitcoin, we produce a novel framework for calculating unhedged demand. Our methodology assumes that all short positions in CME Bitcoin futures held by dealers, asset managers, and leveraged funds are fully hedged on a one-to-one basis with spot Bitcoin ETF holdings. This aggressive assumption yields a conservative estimate of genuine unhedged demand that filters out flows primarily driven by basis trading or arbitrage between CME futures and spot markets.

Remarkably, even under this stringent framework, the estimated unhedged demand closely tracks the steady growth in the spot Bitcoin ETF balances over time. This close correlation suggests that basis trading, a common arbitrage strategy exploiting price differentials between CME futures and spot Bitcoin, is only a marginal contributor to ETF inflows. Instead, the data indicates that a substantial portion of spot Bitcoin ETF inflows represents authentic, long-term institutional demand for regulated Bitcoin exposure. This reflects an ongoing, meaningful infusion of traditional financial liquidity into the digital asset ecosystem.

This trend underscores the maturation of the Bitcoin market, where demand is no longer dominated solely by retail or speculative flows but is increasingly underpinned by sophisticated institutional investors deploying significant capital. The sustained growth in spot Bitcoin ETF holdings highlights both deepening market liquidity and a broadening investor base, which in turn enhances market stability and reduces volatility. As traditional financial institutions continue to embrace Bitcoin through these regulated channels, we expect this structural liquidity to further strengthen, supporting price discovery and fostering a more resilient market.

Spot Bitcoin ETF: Unhedged Demand



Data sources: Avenir Group, Glassnode, CFTC

Altcoin Liquidity Measures

Altcoin Market Cap

Altcoins struggle to gain ground amid rising Bitcoin dominance

Having established Bitcoin's strong performance and abundant liquidity from both on- and off-chain perspectives, we now turn to the altcoin sector to assess how assets further out on the risk curve have performed this cycle.

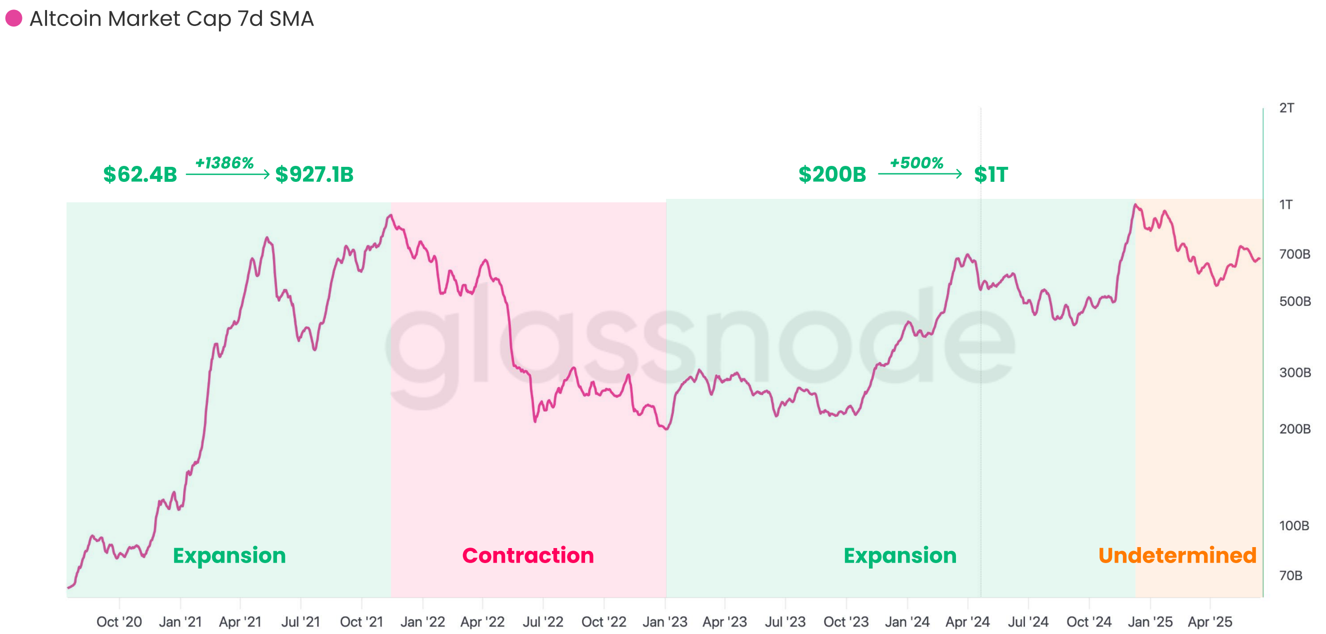
When measuring from the FTX low of November 2022, the aggregate altcoin sector has grown from a low of $200B to a peak of $1T set in December 2024, coinciding with Bitcoin's first break above the psychological $100K level. Nevertheless, this growth pales in comparison to the performance of the previous cycle, which saw the altcoin sector expand from $62.4B in July 2020, to a remarkable peak of $927.1B in November 2021, a +1386% increase. Two key takeaways emerge from this comparison:

- Growth across the altcoin market has largely underwhelmed, with total valuations effectively stagnating across cycles.
- Bitcoin's market cap has increased by 728% this cycle, while the altcoin market cap has risen by only 500%, suggesting that altcoins have struggled to attract meaningful investor capital.

One potential explanation for the broad underperformance of altcoins is the current macroeconomic and geopolitical landscape. With rising global tensions and heightened macroeconomic stress, investors have shown a decreased appetite for highly speculative risk assets, especially those with already elevated valuations following multiple growth cycles.

Moreover, venture capital funding in the altcoin space has declined significantly this cycle. When coupled with persistent and substantial sell-side pressure from ongoing token unlock schedules, these dynamics create pronounced headwinds for altcoin performance.

Altcoin Market Cap



Data Source: Glassnode

Major Altcoins Aggregated Realized Cap Growth

Capital inflows to top altcoins have contracted

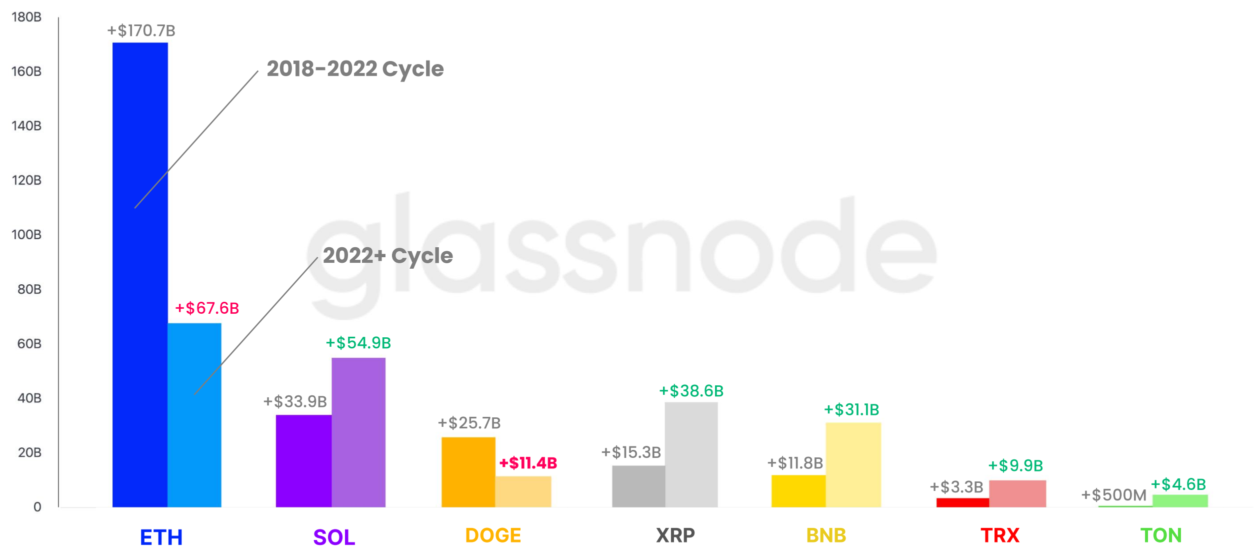
To investigate the slowdown in growth in the altcoin sector, we examine the net capital inflows across the top altcoins (ETH, SOL, XRP, DOGE, BNB, TRX, TON) during the previous bull market (December 2018–November 2021) versus the current cycle (November 2022–present).

During the 2018–2021 cycle, these altcoins collectively absorbed over $261.2B in fresh capital inflows, compared to just $215.1B so far in the current cycle, a $46.1B decline that underscores a notable contraction in liquidity growth.

- **Ethereum:** $170.7B to $67.6B
- **Solana:** $33.9B to $54.9B
- **DOGE:** $25.7B to $11.4B
- **XRP:** $15.3B to $38.6B
- **BNB:** $11.8B to $31.1B
- **TRX:** $3.3B to $9.9B
- **TON:** $500M to $4.6B

When assessing the distribution of capital inflows across the top altcoins, we note that Ethereum, the leading altcoin, dominated altcoin capital flows during the 2018-2022 cycle, acquiring 65.3% of all liquidity. However, Ethereum's dominance has substantially waned in the 2022+ cycle, with liquidity flows becoming markedly more distributed across the top assets. This redistribution particularly benefited Solana, XRP, and BNB, driving their outperformance relative to the broader altcoin sector.

Major Altcoins: Realized Cap Performance



Data Source: Glassnode

Large Cap Altcoin Performance

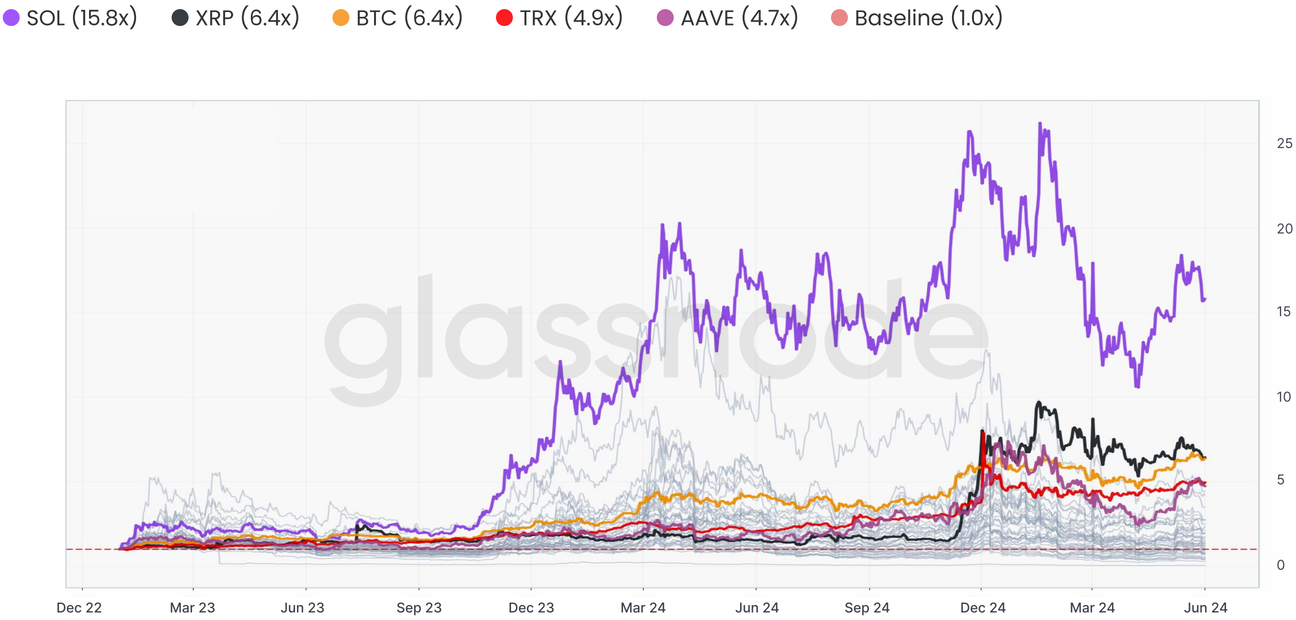
Only Solana and XRP have outperformed Bitcoin

Assessing the performance of large cap altcoins (>$1B market cap) against Bitcoin since the start of January 2023, we note that only Solana and XRP outperformed Bitcoin across the timeframe.

This aligns with the substantial increase in capital inflows for the two assets as noted in the previous section, as well as their idiosyncratic catalysts such as Solana's rapid growth in altcoin issuance, and the regulatory clarity achieved for XRP after a prolonged lawsuit.

This highlights the relative underperformance of large cap altcoins compared to Bitcoin, which achieved a much higher performance despite being orders of magnitude larger than many of its competitors. This trend suggests that investors are paying a premium for Bitcoin's core attributes: a scarce, decentralized asset with dominant network effects and deep liquidity, making the asset a more desirable investment vehicle in a more cautious and deglobalizing world.

Large Cap Altcoin Performance



Data Source: Glassnode

Solana (SPL) Altcoin Market Cap

Speculative flows are especially concentrated in SPL tokens

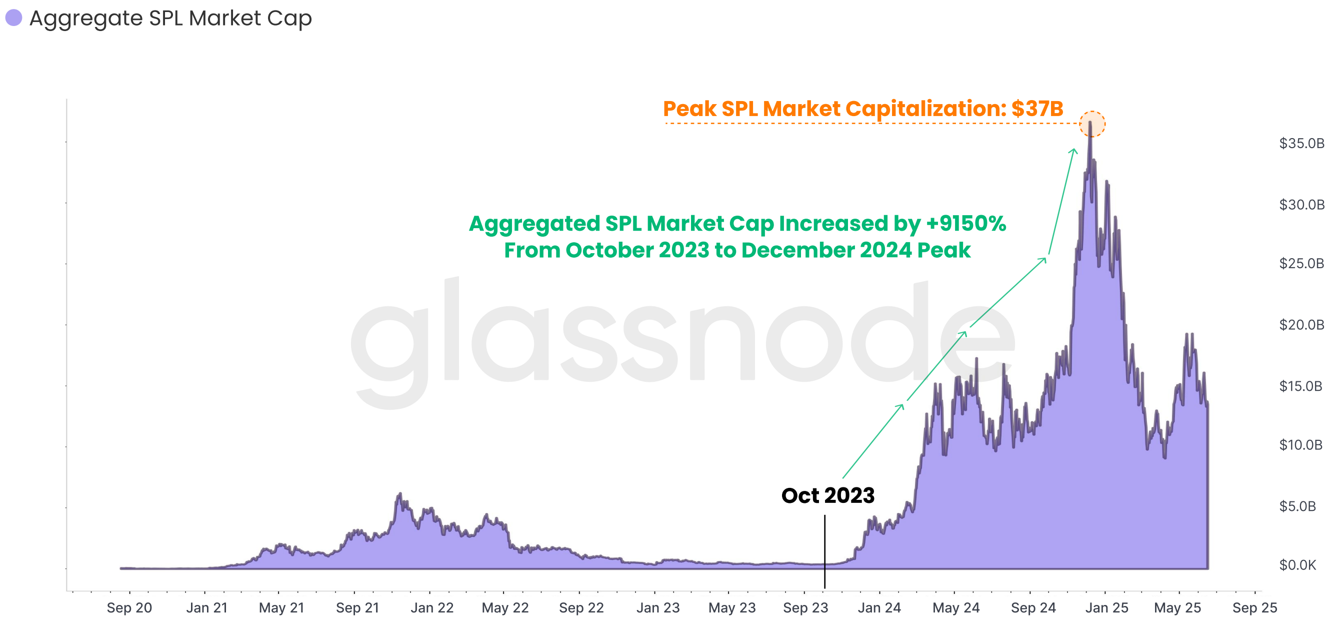
Interestingly, despite the diminishing returns across the broader altcoin sector, Solana Program Library (SPL) tokens have emerged as the market victors of this cycle. The aggregated SPL Token market cap has experienced an extraordinary increase, rising from $400M in October 2023 to a peak of $37B in December 2024, a staggering +9150% increase, reminiscent in scale to previous altseasons.

A significant majority of the market cap increases can be attributed to the rise in popularity of "Meme Coins", which are highly illiquid tokens launched on the Solana network without inherent utility, and derive their value purely from speculation.

The meme coin phenomenon can be viewed as a late-stage evolution of earlier speculative phases, such as the 2017 ICO boom and 2021 DeFi/NFT summer, where token launches were fueled by aggressive retail participation and substantial venture capital support. Notably, altcoin speculation has shifted from Ethereum to Solana, helping propel Solana's native token to exceptional heights this cycle.

This dynamic underscores a clear bifurcation in digital asset liquidity, with inflows disproportionately favoring assets at opposite ends of the risk spectrum: Bitcoin as a perceived currency debasement hedge and SPL meme coins as pure speculative vehicles. Meanwhile, mid-tier digital assets have largely lagged behind, marred by continued sell-side pressure from unlock schedules and a drying up of meaningful capital inflows from both investors and venture capitalists.

Aggregated SPL Token Market Capitalization



Data Source: Glassnode

Macro Linkages and Asset Correlations

Evolution of Bitcoin's Correlation with Various Assets & Macro Indicators

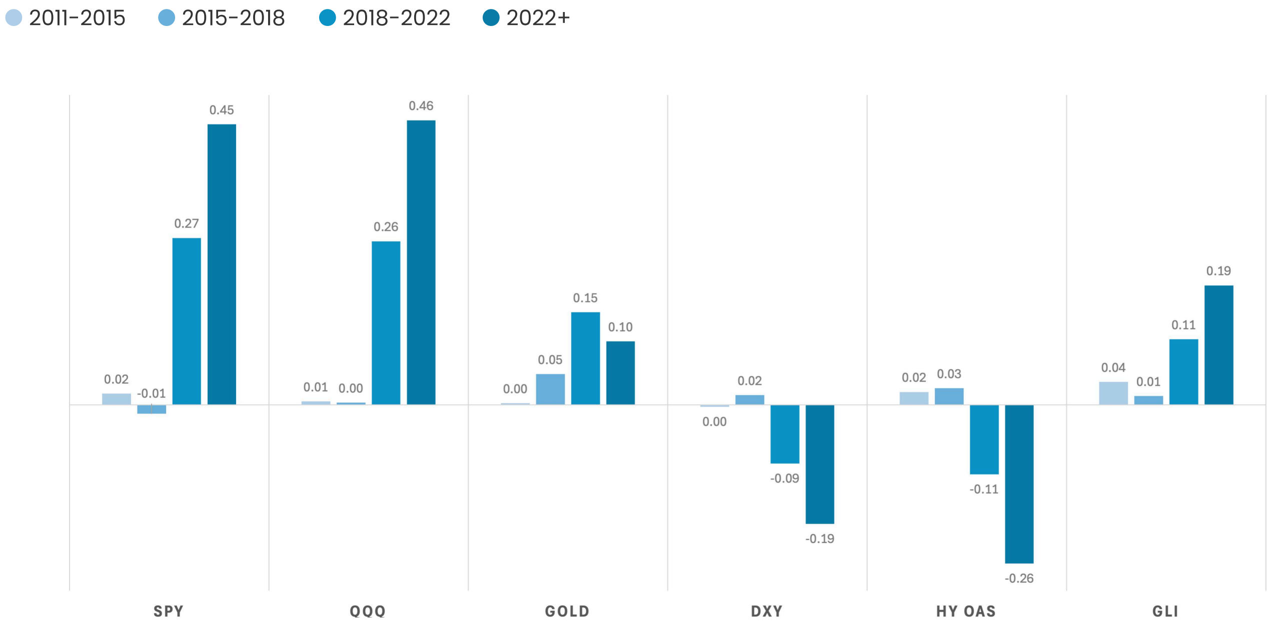
Bitcoin's correlation to risk assets and global liquidity measures has increased across cycles

Finally, we observed that Bitcoin's sensitivity to traditional asset classes and macroeconomic indicators has evolved markedly over the past few market cycles, reflecting its growing integration into the broader macro-financial system.

In particular, Bitcoin's correlation with traditional risk assets such as SPY, QQQ, and gold, as well as with the Global Liquidity Index (GLI), has become increasingly positive. Conversely, its correlation with defensive or stress-related indicators, including the dollar index (DXY) and high yield credit spreads (HY OAS), has turned increasingly negative.

These changing relationships suggest that Bitcoin no longer operates independently of macroeconomic dynamics. Instead, it now systematically responds to shifts in global risk appetite and liquidity—tending to rise alongside risk assets during periods of easing and falling when financial stress intensifies or the dollar strengthens.

Evolution of Bitcoin's Correlation with Various Assets & Macro Indicators



Data sources: Avenir Group, TradingView

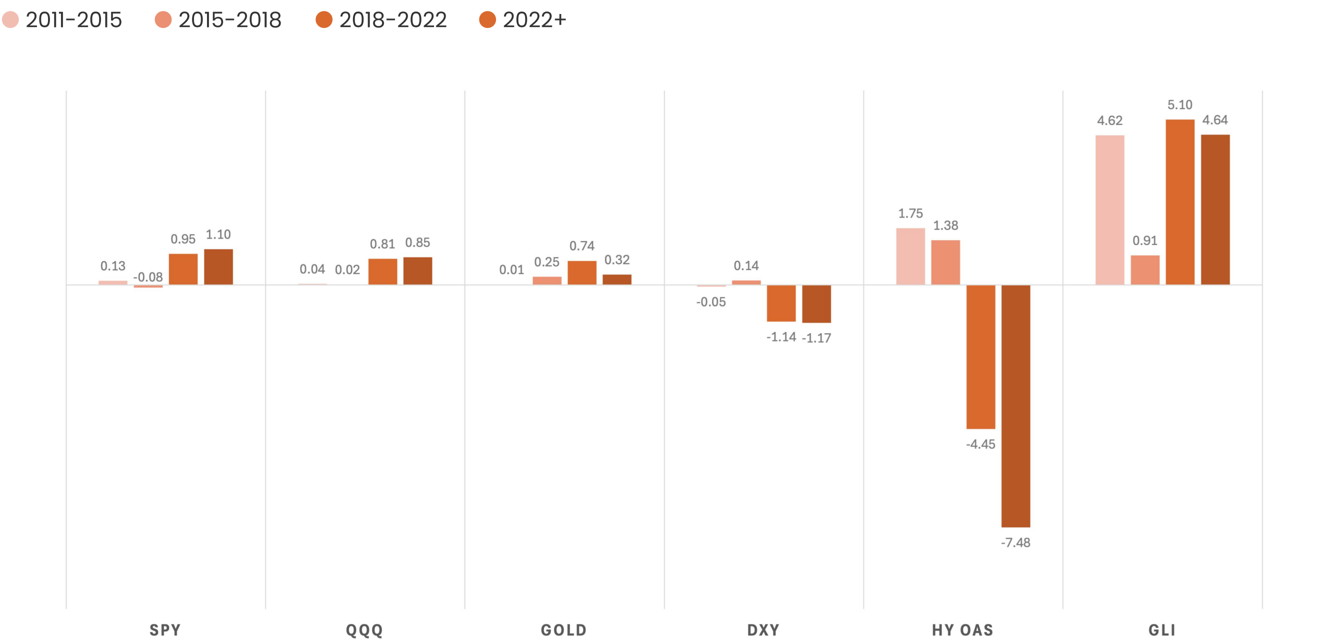
Changes in Beta Loading of Various Assets & Macro Indicators on Bitcoin

Bitcoin benefits disproportionately from accommodative financial conditions

Furthermore, Bitcoin exhibits particularly high beta loadings with respect to GLI and HY OAS, indicating pronounced sensitivity to changes in global liquidity and market sentiment. A strong positive beta to global liquidity suggests that Bitcoin tends to magnify gains during liquidity expansions, benefiting disproportionately from accommodative financial conditions. In contrast, a large negative beta to HY OAS implies that Bitcoin is highly exposed during periods of market stress, underperforming as spreads widen and investor sentiment deteriorates.

Taken together, these dynamics underscore Bitcoin's evolution into a macro asset, one which is highly sensitive to shifts in global liquidity and increasingly serving as a bellwether for broader macroeconomic conditions.

Changes in Beta Loading of Various Assets & Macro Indicators on Bitcoin



Data sources: Avenir Group, TradingView

Conclusion

The findings of this research underscore that Bitcoin's performance is increasingly defined by the same forces that drive traditional markets. It responds positively to global liquidity expansions, negatively to credit stress, and its correlation with equities continues to strengthen. The emergence of persistent ETF inflows confirms that institutional capital is not merely trading Bitcoin, it is allocating to it.

This cycle represents a decisive break from the speculative, retail-dominated patterns of prior eras. Institutional infrastructure has reshaped how capital engages with Bitcoin. As a result, its market behavior is increasingly governed by structural liquidity, long-horizon positioning, and regulated access points.

At the same time, the digital asset landscape is fragmenting. While Solana meme coins attract speculative flows and mid-tier altcoin tokens stagnate, Bitcoin stands apart, benefiting from scale, regulatory clarity, and structural alignment with macro forces.

Bitcoin's performance profile increasingly aligns with that of an emerging global asset, capable of attracting institutional capital, maintaining structural integrity, and competing directly with equities and gold for investor attention.

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