

## Monthly Outlook

*The Bitcoin Ecosystem*

October 10, 2024

- **The advent of new Bitcoin layer-2s over the last two years may soon start to overcome some of Bitcoin's programmatic and functional limitations.**
- **This may potentially unlock new forms of economic value for the network and support the growth of decentralized finance on Bitcoin (or BTCFi).**
- **However, technological limitations persist such as Bitcoin's UTXO (Unspent Transaction Output) architecture and its intentionally sparse scripting language.**

Historically, the primary use case for bitcoin (BTC) has been as a store-of-value due to its unique role in the crypto asset class as well as its limitations – both programmatically and functionally. Indeed, smart contract platforms like Ethereum and Solana stepped in primarily to enable the more complex computations on blockchains that Bitcoin couldn't. But a host of new Bitcoin infrastructure including layer-2s, bridges, virtual machines (VM), wallets and staking protocols is forming a new Bitcoin ecosystem.

The value proposition is simple – BTC is the most popularly held cryptocurrency in the asset class, as reflected by a 57% dominance (\$1.2T) of the total crypto market cap. Consequently, there's plenty of appetite from BTC owners looking to do more with their BTC other than just holding it. Moreover, these developments may be necessary to generate the fees that help incentivize miners over the long run, as their rewards continue to be halved every 210k blocks. The concern, however, is that all of this may radically change the complexion of the network by adding complexity and risk to the ecosystem, while potentially contravening Bitcoin's core ethos.

For now, we do not expect these developments to become idiosyncratic drivers of BTC performance in the short term. This distinguishes BTC somewhat from ETH where the advent of L2s have led many market players to treat (some) L2 tokens as higher beta proxies for ETH. Comparatively, we think the work happening on Bitcoin L2s will be captured as its own (independent) trading narrative for the time being, while BTC value will be anchored to the fundamental activity happening on the base layer.

**David Duong, CFA**

Head of Institutional Research

[david.duong@coinbase.com](mailto:david.duong@coinbase.com)

Tel: + 1 646-233-1947

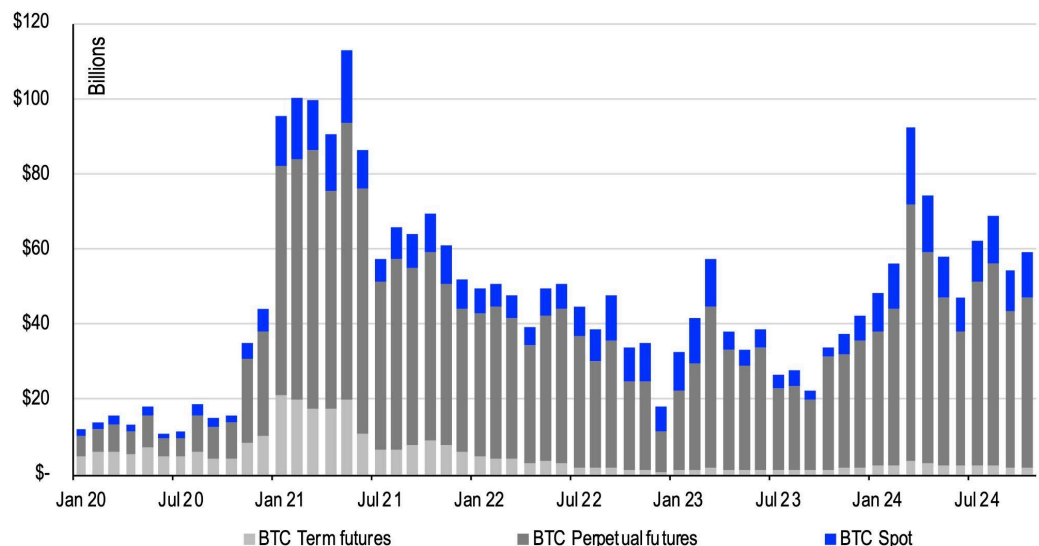
## Election season

Following the Federal Reserve's [interest rate decision](#) on September 18, we expect the US elections to be the next major market catalyst for nearly all assets – both traditional and digital. This may last through November 5 and possibly for a few days or weeks beyond, depending on how long it takes to reconcile the votes. Endogenous crypto factors are likely to take a backseat until then.

Meanwhile, the influence of the Fed's monetary policy is starting to wane, even with the upside surprises in the labor data, alongside the immediate effect of China's extraordinary fiscal and monetary stimulus. (That said, the liquidity impact of those measures may yet take months to percolate). For now, we think crypto could see increased adoption by institutional investors looking for a way to trade election outcomes, given the lack of regulatory clarity surrounding the majority of non-bitcoin tokens.

Overall, our outlook on the elections as a market factor is fairly optimistic with regards to the outcome for crypto from a regulatory perspective. Both US presidential candidates have expressed pro-crypto sentiment at various times during this campaign, and we would expect that support to translate into a more amenable crypto environment going forward. While we think the market reaction will ultimately be neutral to positive in 4Q24, we would expect any sell-off after the event to be met with institutional support because of the clear upside for the asset class.

**Chart 1. Daily average BTC volume by month**



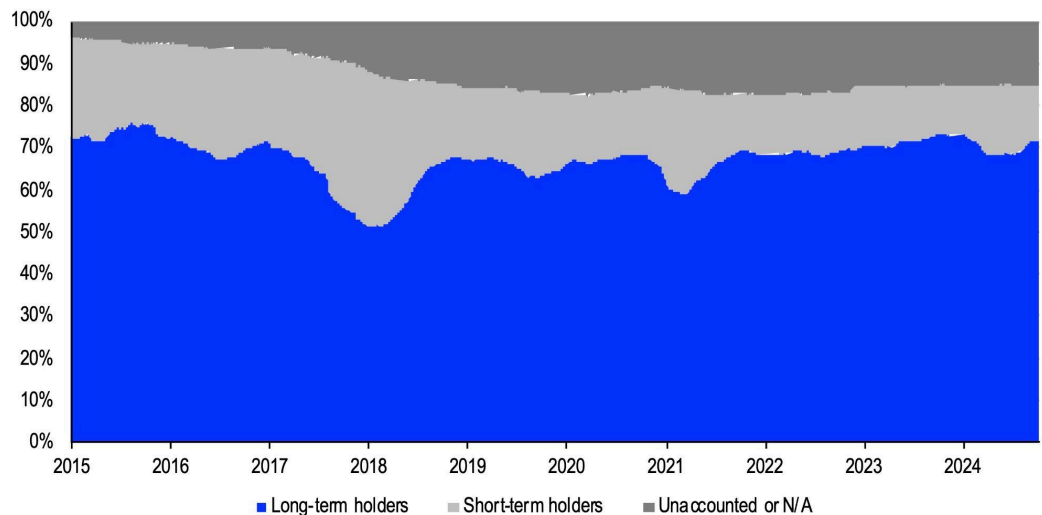
Measured across 17 global centralized exchanges. Sources: CoinMetrics and Coinbase.

## My bitcoin and me

At the recent [Token2049 Conference](#) in Singapore (September 17-19), several upcoming crypto themes were discussed including (1) the launch of various emerging alternative layer-1s (e.g. BeraChain, Monad), (2) the use of chain abstraction to create a unified user interface across blockchains, and (3) the future path for AI x blockchain integration. But significant attention was also given to expanding the Bitcoin ecosystem, as interest in this theme likely mirrors the stronger performance of bitcoin year-to-date.<sup>1</sup>

Bitcoin liquidity tends to lay mostly dormant due to its role as a store-of-value in the crypto space, particularly compared to ether's widespread use as collateral in the decentralized finance (DeFi) sector. Indeed, around 72% of the total bitcoin supply is potentially sitting idle among long-term holders (defined as anything greater than 155 days), according to Glassnode. See Chart 2. To unlock that liquidity, a lot of work is currently going into how to overcome Bitcoin's functional limitations and extend the network's capabilities – potentially creating new sectors in the Bitcoin ecosystem such as BTCFi (or Bitcoin DeFi).

**Chart 2. Around 72% of total BTC supply is held by long-term holders**



Sources: Glassnode and Coinbase.

These innovations were first enabled by Bitcoin's Segregated Witness (SegWit, 2017) and Taproot (2021) software upgrades, but the momentum didn't pick up until the creation of [Ordinals](#) in early 2023 and later the release of the [BitVM white paper](#) in October 2023. As a follow up, a [BitVM2 white paper](#) was recently published in August 2024, which advances the

<sup>1</sup> Note: we use "Bitcoin" with an uppercase B to refer to the network and "bitcoin" with a lowercase b to refer to the token.

original BitVM design and helps bring the concept of a programmable Bitcoin network closer to reality – without altering the core Bitcoin code.

Note however that there *is* a proposal (BIP-347) that *could* change the underlying Bitcoin code by reintroducing the script operation code “OP\_CAT” (to concatenate data on the stack) – formalized in April 2024. Long story short: this could eventually enable more complex smart contract functionality on Bitcoin via covenants. However, there is currently no consensus on its approval as of yet.

Many of the projects forming the new Bitcoin infrastructure (propagated by these ideas) are represented as [Bitcoin layer-2s](#) (L2s) with around 80-90 different rollups, sidechains and state channels either already on mainnet or under development. That said, the broader ecosystem comprises a wide range of other components including wallets, staking protocols and bridges. The breadth of this sector has made investing here particularly challenging for the uninitiated, but more recently, the market has started to narrow in on around 10-20 different protocols.

### **Hype or reality?**

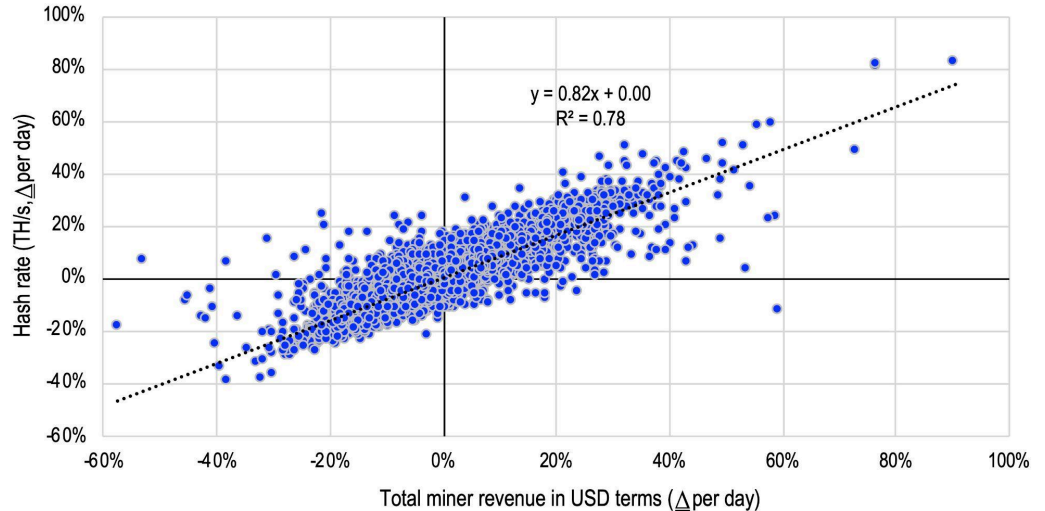
New transactions take around 10 minutes on average to be confirmed and added to Bitcoin (though processing times vary in practice). But finalization can often take longer because many recipients generally require several blocks to be added to that preceding block before a transaction can be considered “settled” or immutable. Tackling the issue of speed is one of the primary reasons why L2s like the [Lightning Network](#) (launched in 2018) were created and one of the reasons why having a mainstream Bitcoin L2 could be useful, if not essential, in the long run.

The other reason that Bitcoin L2s may be necessary long-term is that the incentives for miners to produce blocks are mainly aligned with rewards that get [halved](#) every 210k blocks. That means that the question of fee generation could become pertinent to the network hashrate after just a few more halving cycles. (This theme refers to the “tail emission debate,” which has been circulating since mid-2022 when former Bitcoin developer Peter Todd wrote [“Surprisingly, Tail Emission Is Not Inflationary.”](#)) All of this is of course contingent on the bitcoin price at that future time, as hash rate is very sensitive to the USD value of total miner revenue. See Chart 3.

Thus, Bitcoin L2s – as scaling and application layers – could potentially be responsible for generating the transaction fees that sustain the viability of block production in the future. Already the launch of new L2 protocols have transformed this long static space into a race: many believe that the

projects capable of unlocking the economic value on Bitcoin could see huge demand from both an adoption and investment perspective.

**Chart 3. Bitcoin hash rate has an (unsurprisingly) high sensitivity to changes in total miner revenue denominated in USD terms**



Data from January 1, 2011 to October 9, 2024. Sources: Glassnode and Coinbase.

However, technological limitations persist. By design, Bitcoin's UTXO (Unspent Transaction Output) architecture doesn't accommodate L2s well, particularly when compared to Ethereum's accounts-based model. Moreover, Bitcoin's scripting language is intentionally sparse to ensure simplicity and security, making it difficult to handle the complex state transitions of more expressive smart contracts – even though Taproot has improved the network's scripting capabilities. Finally, Bitcoin's block size limit (expanded to 4MB with SegWit) restricts how much data can be stored onchain, making it expensive for rollups to use Bitcoin for data availability.

In effect, many of these L2s represent workarounds for Bitcoin's existing infrastructure rather than complementary technologies that enhance the network's inherent functionality, unlike [Ethereum](#) or other smart contract platforms. Moreover, the idea of altering the underlying Bitcoin code is anathema to many in the community, which makes adjusting the base layer to accommodate these L2s very challenging. Indeed, many community members admire Bitcoin's minimalism and prefer that bitcoin simply remains a decentralized store of value. They believe that building complex L2 solutions could contravene Bitcoin's core ethos and potentially increase its attack surface.

## New sectors

**Payments and scaling.** The [Lightning Network](#) (LN) is one of the oldest and perhaps most well known Bitcoin L2, implemented as a network of state channels to enable cheap, instantaneous offchain transactions that periodically get committed to the base layer (when these channels are closed). The LN was designed primarily to handle payments and reduce congestion on the base layer, in theory capable of processing millions of transactions per second (vs Bitcoin's five transactions per second on average). More recently however, a number of [other use cases](#) have been built to unlock a variety of new economic activities supported by the base layer.

**Staking.** One of the most anticipated use cases for bitcoin is self-custodial [staking](#), led by protocols like Core DAO and Babylon Chain, which form a big part of the emerging BTCfi sector. In principle, these staking protocols permit bitcoin holders to earn a yield for securing other networks – specifically networks that rely on the proof-of-stake (PoS) consensus mechanism. The idea is that this could potentially allow users to tap into one of the largest economic security funds in crypto, akin to the [restaking model](#) pioneered by EigenLayer on Ethereum.

**Smart contracts.** Some L2s like Stacks, Rootstock and BOB (Build on Bitcoin) are attempting to move computation off of the base layer in order to introduce more complex smart contract capabilities to the ecosystem. This opens the door to having decentralized applications or dApps on Bitcoin. The means by which these projects are attempting to accomplish this do vary, however, potentially creating tradeoffs on trust assumptions and security guarantees. For example, Stacks runs a separate blockchain that utilizes proof-of-transfer (PoX) to secure its network, whereas BOB relies on the base layer for its security and final settlement. Rootstock enables a Turing-complete virtual machine (RVM) that's compatible with Ethereum's EVM.

**Infrastructure.** New infrastructure like wallets might be required to take full advantage of the expanding functionalities offered by many Bitcoin L2s, particularly as this framework could require synergies between onchain and offchain transactions. Fortunately, much of the groundwork has already been established to help accommodate the new features being introduced to the Bitcoin ecosystem. This is reminiscent of how the Phoenix wallet was specifically created to accommodate the Lightning Network, having itself undergone major developments over the past 18 months.

## Conclusions

For now, many of these protocols are in their early development stages, so we think it will likely take time for their utility in the Bitcoin ecosystem to be fully realized. Indeed, many of the network's L2s are mainly sourcing capital from among crypto natives within the Bitcoin ecosystem, while the lionshare of bitcoin unsurprisingly still remains on the L1. Moreover, bitcoin accumulation is happening more and more via spot bitcoin ETFs and other exogenous sources.

However, we do believe that these scaling solutions represent a burgeoning new sector both for the Bitcoin ecosystem as well as for the crypto asset class writ large. Progress in this space will be important to watch, particularly as many of these protocols represent novel ways to put bitcoin liquidity to work. On the other hand, we don't expect the growth of Bitcoin L2s (as a market narrative) to feature heavily in the performance of BTC itself, at least not for the time being. Rather, we could see Bitcoin L2s being a largely independent theme that trades more with idiosyncratic developments in the sector, while bitcoin may continue to trade more as a macro asset.

## Disclaimer

2024 © Coinbase, Inc. All Rights Reserved. COINBASE and related logos are trademarks of Coinbase, Inc., or its Affiliates. The views and opinions expressed herein are those of the author(s) and do not necessarily reflect the views of Coinbase and summarizes information and articles with respect to cryptocurrencies or related topics. This material is for informational purposes only and is only intended for sophisticated investors, and is not (i) an offer, or solicitation of an offer, to invest in, or to buy or sell, any interests or shares, or to participate in any investment or trading strategy, (ii) intended to provide accounting, legal, or tax advice, or investment recommendations, or (iii) an official statement of Coinbase. No representation or warranty is made, expressed or implied, with respect to the accuracy or completeness of the information or to the future performance of any digital asset, financial instrument or other market or economic measure. The information is believed to be current as of the date indicated and may not be updated or otherwise revised to reflect information that subsequently became available or a change in circumstances after the date of publication. Coinbase, its affiliates and its employees do not make any representation or warranty, expressed or implied, as to accuracy or completeness of the information or any other information transmitted or made available. Certain statements in this document provide predictions and there is no guarantee that such predictions are currently accurate or will ultimately be realized. Prior results that are presented here are not guaranteed and prior results do not guarantee future performance. Recipients should consult their advisors before making any investment decision. Coinbase may have financial interests in, or relationships with, some of the assets, entities and/or publications discussed or otherwise referenced in the materials. Certain links that may be provided in the materials are provided for convenience and do not imply Coinbase's endorsement, or approval of any third-party websites or their content. Any use, review, retransmission, distribution, or reproduction of these materials, in whole or in part, is strictly prohibited in any form without the express written approval of Coinbase. Coinbase, Inc. is licensed to engage in virtual currency business activity by the New York State Department of Financial Services. Coinbase, Inc., 248 3rd St #434, Oakland, CA 94607.