March 2026

The Blockchain Economy

Infrastructure, Security, and the Evolution of Digital Markets

WisdomTree | glassnode

Contents

Executive Summary

Blockchain networks and cryptocurrencies have evolved beyond speculative assets into functioning digital economic systems. This paper examines the blockchain ecosystem through the lens of familiar economic and market-structure concepts, focusing on observable activity, incentives, and infrastructure rather than price action.

At the foundation of this system is the production and consumption of blockspace, priced through transaction fees that provide a transparent measure of on-chain economic activity. Security is provisioned through explicit economic commitments, whether via energy-intensive mining or capital-based staking.

Financial gateways such as exchanges and custodians connect this activity to traditional capital markets, enabling liquidity and institutional participation at scale.

Stablecoins function as the primary settlement and liquidity layer, supporting continuous value transfer and underpinning most on-chain financial activity. Built on this foundation, decentralised finance and tokenisation enable trading, lending, and capital deployment through rules-based systems.

Taken together, these layers form a coherent financial system that increasingly resembles traditional markets in structure, incentives, and economic function.

I — The Blockchain Economy

Reframing Blockchains as Economic Systems

To properly assess the maturity of the blockchain ecosystem, one must move beyond market capitalisation and price action. The ecosystem has matured into a functioning, multi-layered digital economy that can be measured, analysed, and compared against traditional macroeconomic benchmarks. At the core of this economy is the production and consumption of ***blockspace***—a scarce, secure digital resource that underpins all on-chain activity.

Every asset transfer, smart contract interaction, decentralised application usage, and settlement event consumes blockspace. To access this resource, users pay transaction fees. These fees are not merely administrative costs; they form the economic foundation of blockchain networks.

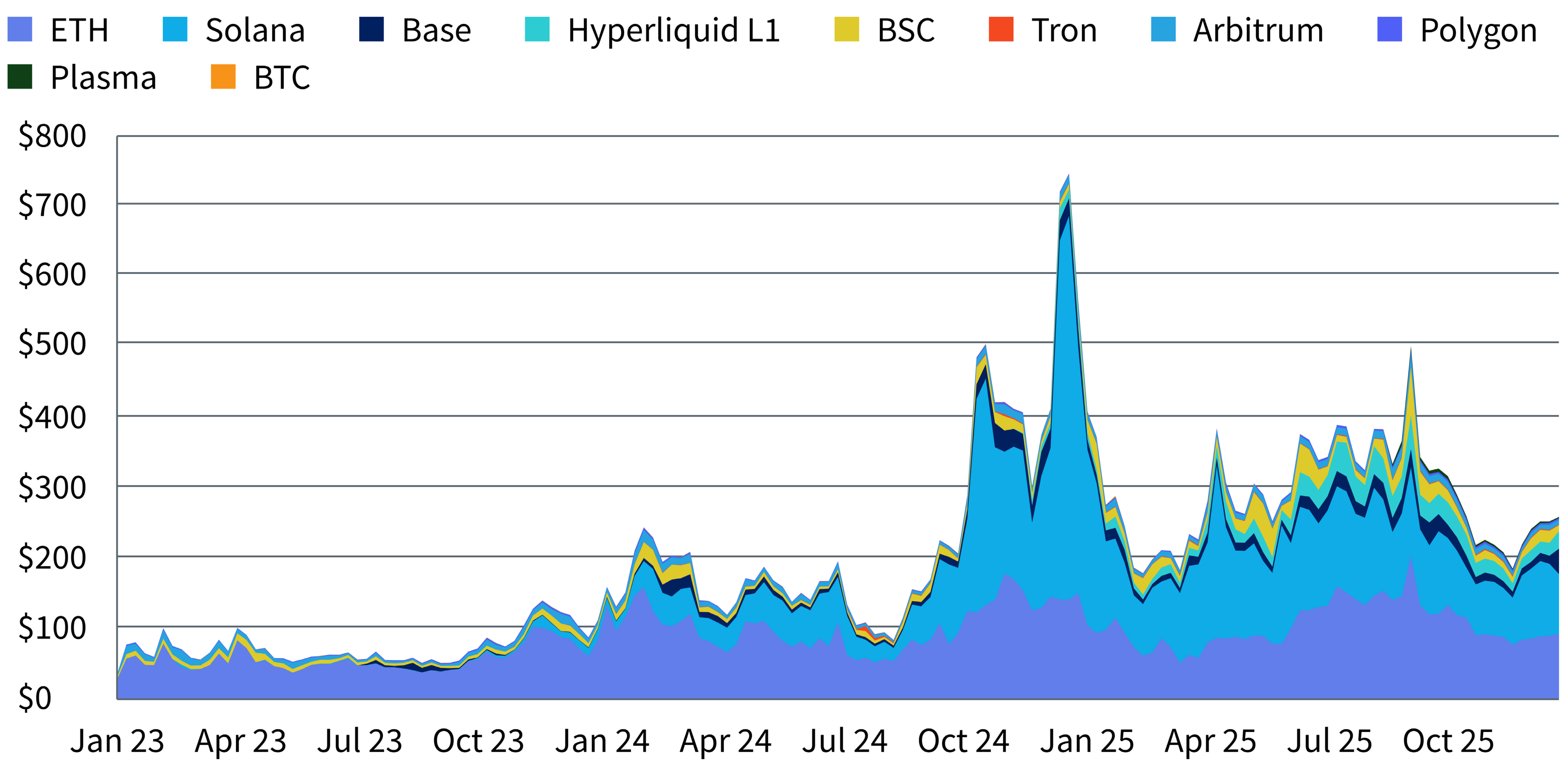
Tracking these fees across blockchains offers a powerful lens for understanding the scale, growth, and underlying health of the broader ecosystem. Unlike traditional economic systems, where data is often lagged, estimated, or subject to revision, blockchain economic data is observable, auditable, and updated in near real time. This transparency allows analysts to quantify economic activity with a level of fidelity that is difficult to achieve elsewhere.

From an economic perspective, transaction fees represent revealed demand for network utility. They function as usage-based payments for secure digital infrastructure, allocating scarce blockspace toward its highest-value uses at any given point in time. As such, this metric provides a direct and conservative indicator of on-chain economic activity, independent of asset price movements.

Blockspace is the limited capacity of a blockchain to process and store transactions. It is a scarce digital resource that underpins all on-chain activity.

Figure 1 presents total fees across major blockchain networks. While these are cyclical and sensitive to market conditions, the multi-year trend reflects sustained growth in on-chain usage and an expanding set of economic use cases. Importantly, transaction fees captures infrastructure-level demand only; it does not measure the full economic surplus generated by applications built on top of these networks. Within those constraints, it nonetheless provides a robust foundation for evaluating the scale and evolution of the blockchain economy.

Figure 1: Total Fees for All Top Assets



Source: **Glassnode. ETH represents Ethereum, BTC represents Bitcoin, BSC represents Binance smart chain. Historical performance is not an indication of future performance and any investment may go down in value.**

II — Security Models and Economic Infrastructure

Security as an Economic Input

All economic systems require mechanisms to protect property rights, process transactions, ensure settlement finality, and deter malicious behavior. In traditional financial systems, these functions are provided by legal frameworks, institutions, and trusted intermediaries. In blockchain-based systems, by contrast, security is not assumed or centrally delegated; it is explicitly funded and enforced through economic incentives embedded in the protocol.

Participants are compensated for committing resources that validate transactions, maintain ledger integrity, and make the system costly to attack. In effect, the protocol functions as a self-clearing infrastructure, where the security budget replaces the need for a central clearinghouse to verify and settle trades.

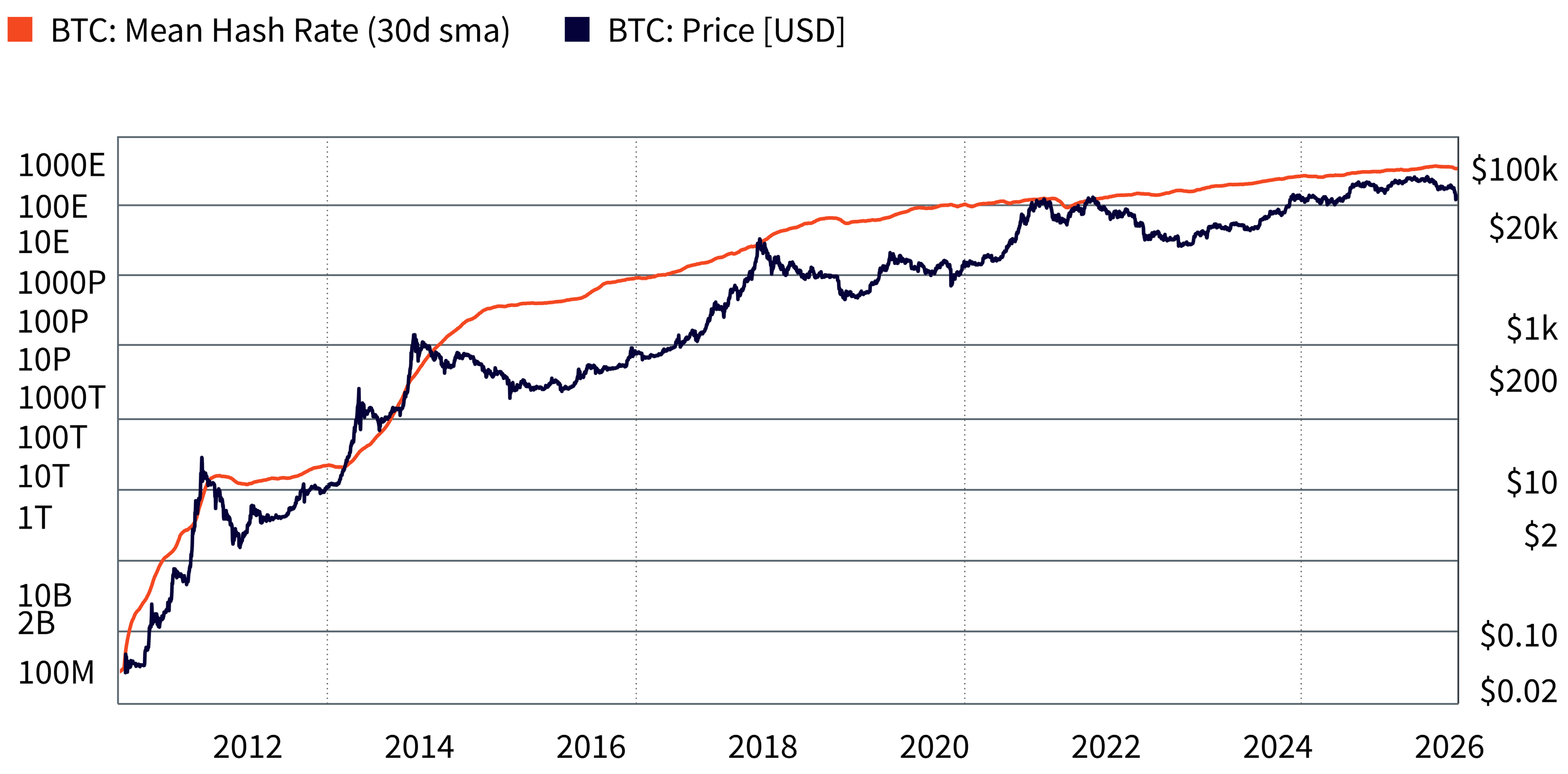
Two dominant security models have emerged to perform this function: **Proof-of-Work (PoW) and Proof-of-Stake (PoS)**. While both aim to secure transaction processing and finality, they rely on fundamentally different economic inputs, with important implications for how security scales.

In blockchain systems, transaction security and settlement finality are enforced through economic incentives built into the protocol.

Energy-Backed vs Capital-Backed Security

Bitcoin represents an energy-backed security model. Under Proof-of-Work, miners convert real-world energy and capital investment in specialised hardware into cryptographic work that validates transactions and secures the digital ledger. The cumulative computational power directed at the network—its hashrate—reflects the aggregate resources that participants are willing to expend to protect transaction finality. As the economic value secured by the network grows, so too does the incentive to attack it, necessitating a higher level of energy-backed security.

Figure 2.1: Bitcoin Hashrate vs. BTC Price

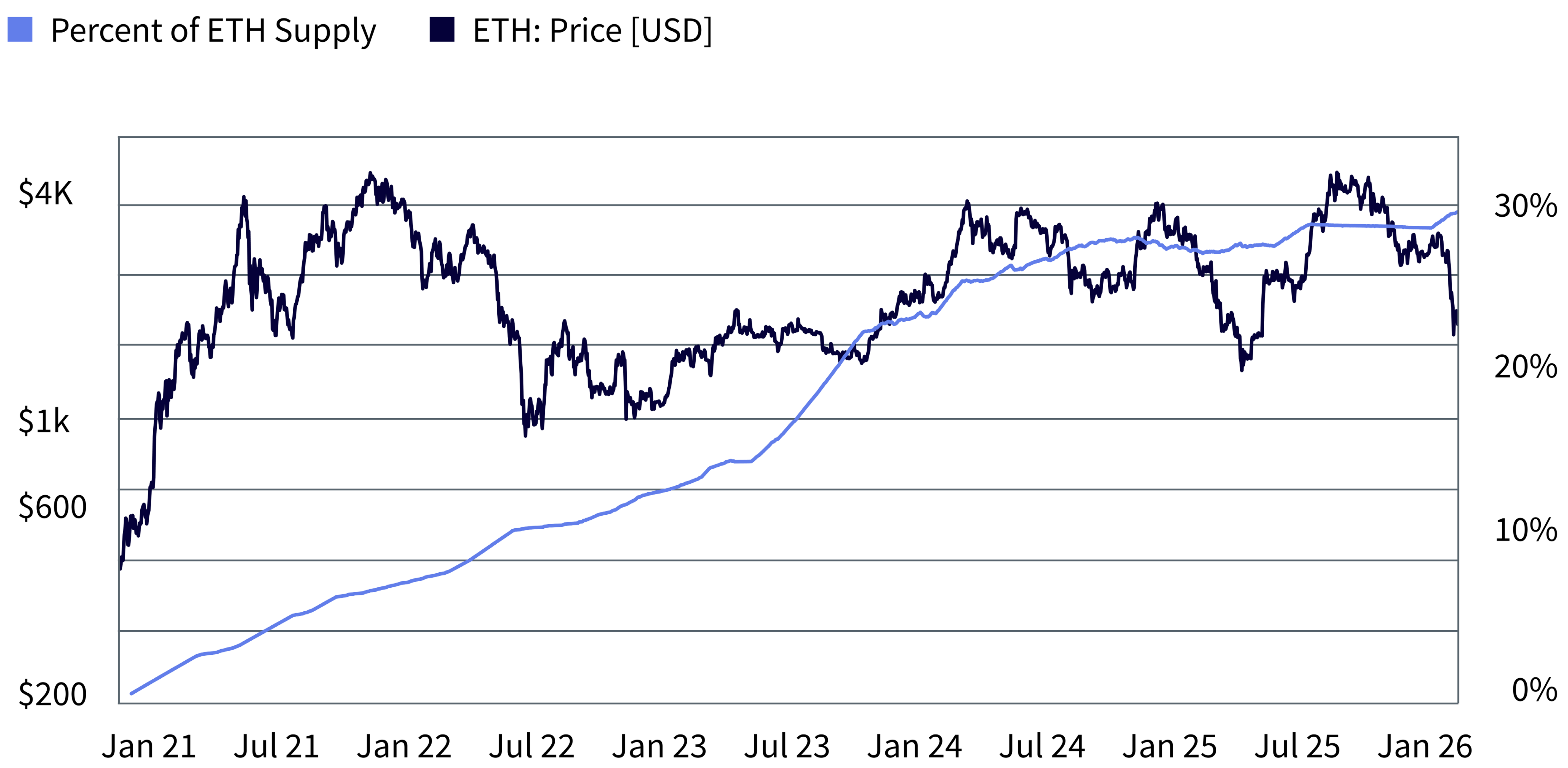


Source: **Glassnode. BTC represents Bitcoin. Historical performance is not an indication of future performance, and any investment may go down in value.**

Ethereum, following its transition to Proof-of-Stake, exemplifies a capital-backed security model. Validators secure transaction processing by locking the native asset as collateral. This model replaces physical work with a capital-commitment requirement. Participants earn protocol-defined yields for honest behavior, but face automated financial forfeiture of their collateral for any misconduct. Security scales with the amount of capital committed, making the network's defensive strength endogenous to the system’s market valuation and liquidity conditions.

Across both models, security must scale with economic activity. Sustaining trust in transaction processing and settlement requires continuous investment in protection. The next section examines this dynamic in detail through Bitcoin mining, where security provision takes the form of a fully industrialised economic activity.

Figure 2.2: Ethereum Staked Supply Over Time (% of Supply)



Source: **Glassnode. ETH represents Ethereum. Historical performance is not an indication of future performance, and any investment may go down in value.**

Bitcoin Mining as the Industrial Security Layer

Bitcoin mining represents the operational layer through which Proof-of-Work security is delivered in practice. As discussed previously, the network's hashrate reflects the aggregate computational resources committed to transaction validation and ledger security. Miners are the economic agents that provide this security. They process transactions, extend the ledger, and enforce settlement finality through computation.

The mining business model is fundamentally defined by the conversion of real-world inputs into protocol-level rewards. Miners deploy electricity and specialised hardware to perform computational work, earning compensation in the form of transaction fees paid by users and newly issued bitcoin. These rewards are realised at prevailing market prices, directly linking miner revenues to both asset prices and on-chain activity.

Mining profitability is therefore determined by the spread between revenues and operating costs. On the cost side, electricity prices and hardware efficiency dominate, placing operators along a global cost curve with material dispersion in margins.

This structure closely resembles capital-intensive commodity industries. During periods of revenue compression, higher-cost operators are forced to curtail operations or exit, while efficient, well-capitalised miners gain share. Over time, these dynamics have driven consolidation and a shift toward institutional-scale operations, reinforcing the industrial nature of the security layer.

Table 2.1: Fleet Efficiency & Power Cost Estimates for Major Public Miners

	BITF	BTDR	CIFR	CLSK	CORZ	HIVE	IREN	MARA	RIOT
Daily Revenues	$673,808	$2,101,368	$898,411	$1,903,413	$620,513	$951,706	$1,903,413	$620,513	$1,465,628
Hash Rate (PH)	17700	55200	23600	50000	16300	25000	50000	60400	38500
Watts per TH/s	17.0	22.8	16.8	16.1	24.3	17.7	15.0	19.0	20.5
Energy Cost kWh	$0.052	$0.039	$0.031	$0.056	$0.060	$0.045	$0.035	$0.040	$0.042
Daily Energy Cost	$376,115	$1,171,030	$294,981	$1,079,904	$570,370	$477,900	$630,000	$1,101,696	$795,564
Pool Fees (2%)	$13,476	$42,027	$17,968	$38,068	$12,410	$19,034	$38,068	$0	$29,313
Gross Profit/day	$284,217	$888,311	$585,461	$785,440	$37,733	$454,772	$1,235,344	$1,197,626	$640,751
Gross Profit/month	$8,526,496	$26,649,319	$17,563,843	$23,563,212	$1,131,980	$13,643,166	$37,060,332	$35,928,795	$19,222,536
Mining Margin %	42.2%	42.2%	65.2%	41.3%	6.1%	47.8%	52.1%	52.1%	43.7%

Source: Power Mining Analysis, as of January 2026. **Historical performance is not an indication of future performance and any investments may go down in value.**
The table demonstrates how differences in energy costs and hardware efficiency translate into materially different margin profiles and cost positions across operators. Tickers represented: BITF (Bitfarms), BTDR (Bitdeer), CIFR (Cipher Mining), CLSK (CleanSpark), CORZ (Core Scientific), HIVE (HIVE Digital Technologies), IREN (Iris Energy), MARA (Marathon Digital), RIOT (Riot Platforms).

III — Financial Gateways and Institutional Access

Exchanges and Custodians as Financial Gateways

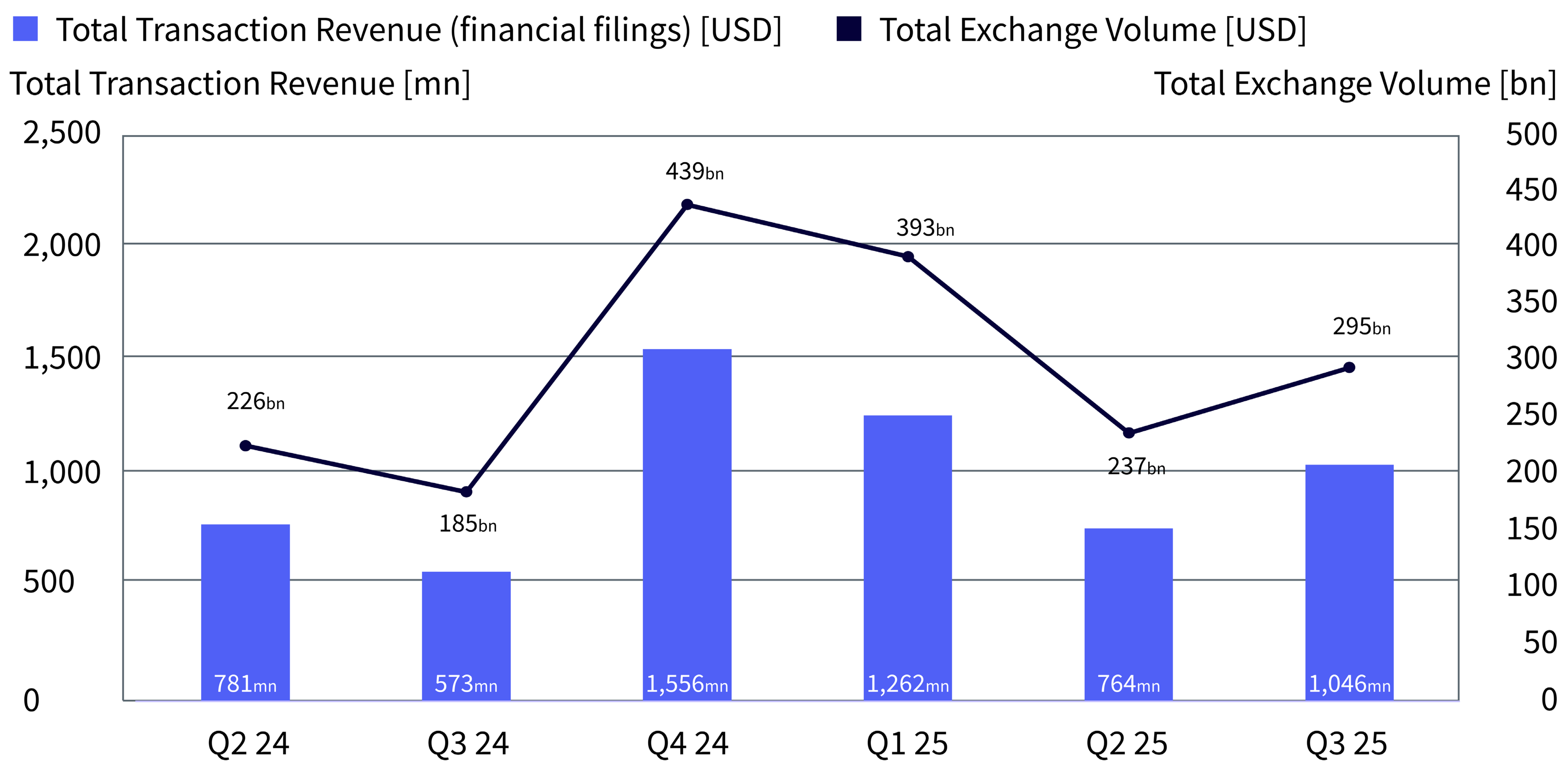
If blockchain networks represent the economic substrate, exchanges and custodians function as the primary financial gateways, connecting on-chain activity with traditional capital markets.

The revenue models of these gateways are directly linked to on-chain activity and comprise both transaction-based and recurring components. Trading revenues scale with transaction volumes and volatility, while recurring custodial revenues reflect asset accumulation and trust in the underlying infrastructure. Unlike many traditional financial intermediaries, a substantial portion of the activity that drives these revenues is observable on-chain.

Exchange revenues are therefore highly sensitive to the on-chain cycle. Periods of elevated network usage and price activity tend to coincide with higher spot and derivatives volumes, while macroeconomic shocks are often reflected through increased volatility and trading intensity. This creates a clear relationship between on-chain activity and the financial performance of gateway firms.

The key implication is one of scale and relevance. Exchanges and custodians already intermediate large transaction volumes and generate substantial revenues, positioning them as economically significant participants within the blockchain ecosystem.

Figure 3.1: Coinbase Quarterly Revenue vs. On-Chain Volumes



Source: **Coinbase public financial filings, TheBlock. Historical performance is not an indication of future performance and any investment may go down in value.**

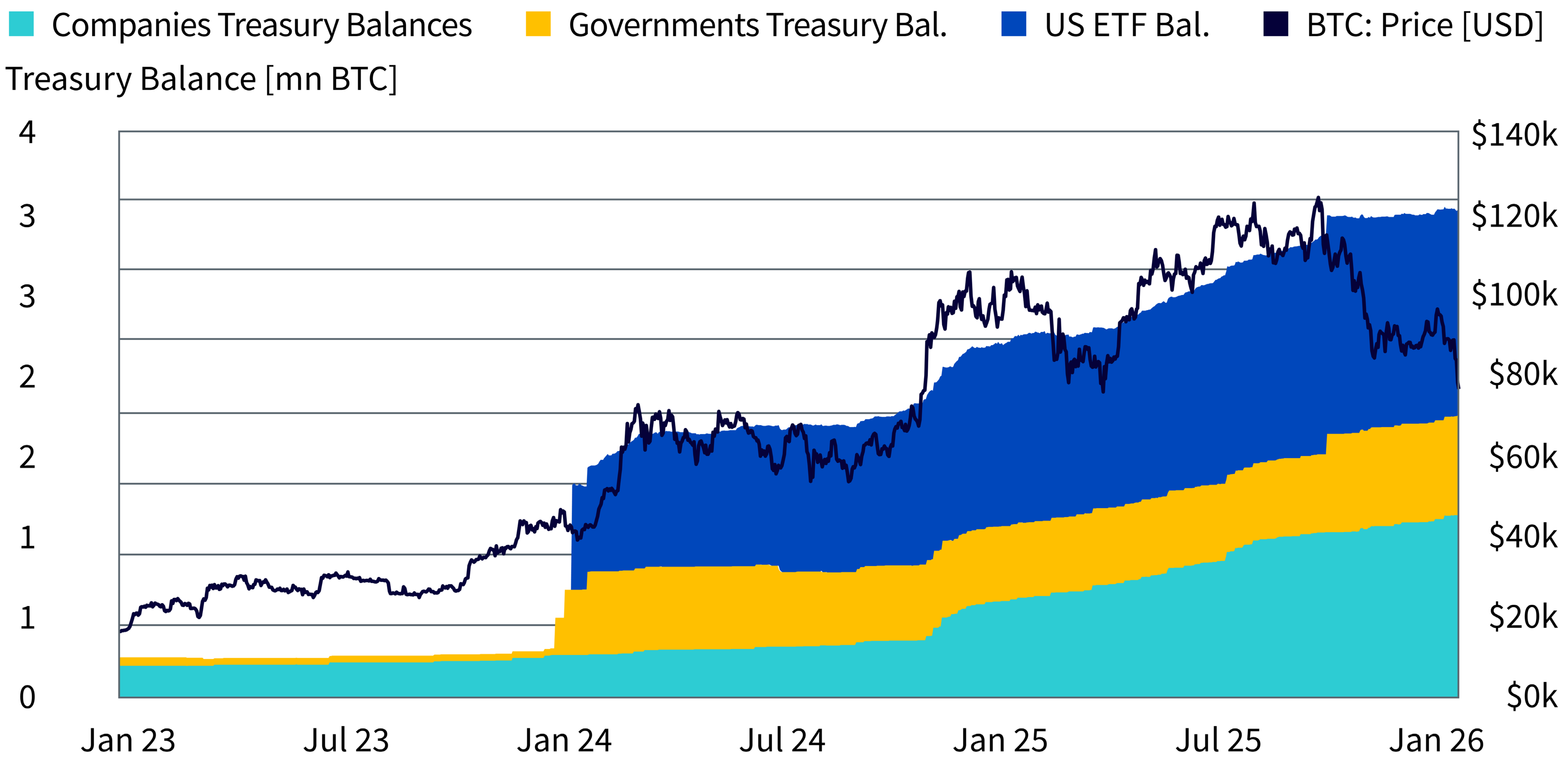
Institutional Ownership and Economic Stakeholders

As financial gateways such as exchanges and custodians have expanded access and improved operational infrastructure, the ownership base of major digital assets has increasingly shifted toward institutional and regulated channels. Enhanced liquidity, regulated trading venues, and institutional-grade custody have enabled participation by investors operating within formal governance and risk frameworks.

As a result, exchange-traded products, corporate treasuries, custodians, and sovereign entities now represent a growing share of ownership.

This evolution reflects demand for balance-sheet compatibility, regulatory clarity, and operational robustness. From a structural perspective, digital assets are no longer held predominantly by early adopters and retail participants. They are increasingly owned by long-term capital with defined investment mandates, governance standards, and risk controls—a defining characteristic of the blockchain economy's maturation and its integration with global capital markets.

Figure 3.2: Institutional & Corporate Ownership of Bitcoin (Time Series)



Source: Glassnode. BTC represents Bitcoin, ETF represents Spot Bitcoin Exchange-Traded Fund. **Historical performance is not an indication of future performance, and any investment may go down in value.**

IV — Stablecoins: The Settlement and Liquidity Layer

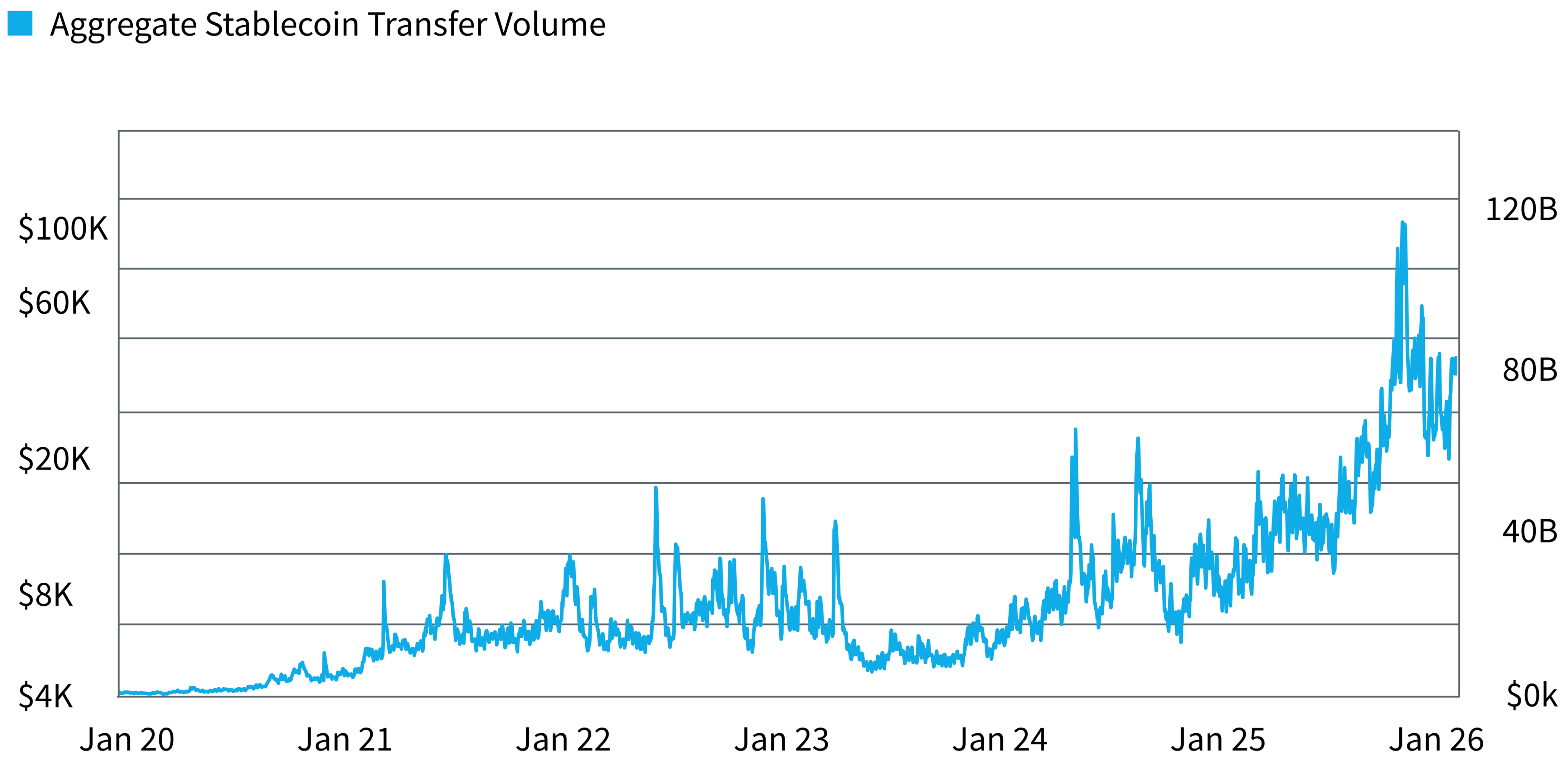
Stablecoins as a Primary Settlement Utility

Stablecoins (fully backed, USD-pegged tokens) function as the primary unit of account and medium of exchange within the blockchain economy. While legally structured as liabilities of off-chain issuers (such as Circle, issuer of USDC), they operate on-chain as the core liquidity instrument for trading, settlement, and collateralization across decentralized applications.

A defining characteristic of stablecoins is settlement efficiency. Unlike traditional fiat transfers, which depend on tiered interbank clearing and deferred reconciliation cycles (T+1 or T+2), stablecoin transactions achieve instant finality upon block confirmation. This enables the simultaneous exchange of assets and payments, virtually eliminating the "settlement gap" where one party has performed but the other has not yet settled. This real-time clearing allows participants to manage liquidity continuously across global markets, 24/7.

As a result, stablecoins now underpin a vast share of on-chain economic activity. They serve as the dominant trading pair on exchanges, the primary collateral asset in decentralized lending markets, and an increasingly utilized rail for cross-border value transfer. Their importance lies in this necessary operational role as the key connective tissue of the digital financial system.

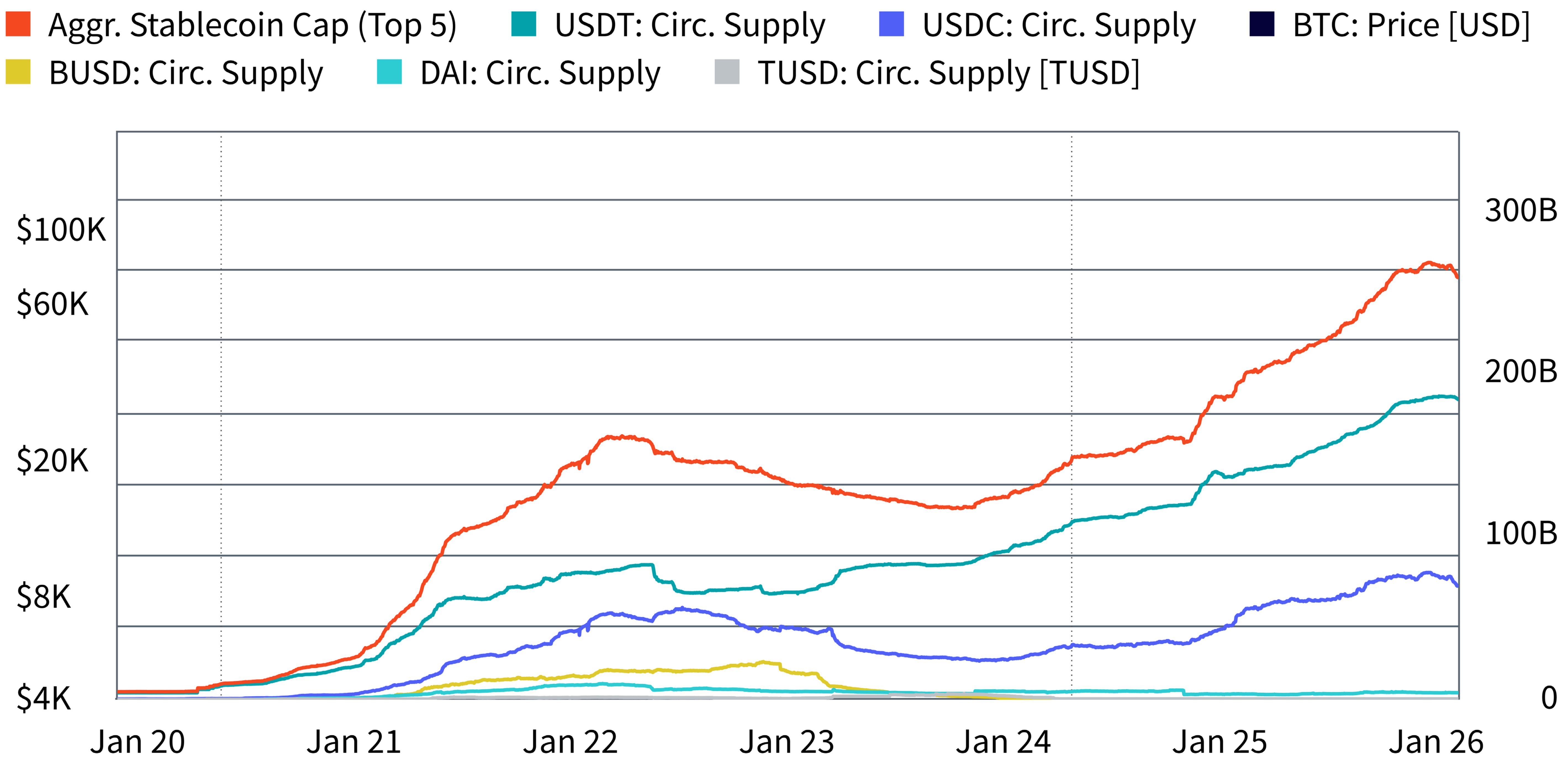
Figure 4.1: Daily Stablecoin Transfer Volume



Source: Glassnode. **Historical performance is not an indication of future performance and any investment may go down in value.**

Growth in the outstanding supply of stablecoins reflects an expansion of available on-chain liquidity. It indicates that capital is being transferred from traditional banking rails onto blockchain infrastructure to support transactional activity, trading, and protocol usage.

Figure 4.2: Stablecoin Supply Over Time



Source: Glassnode. **USDT represents Tether's circulating supply, USDC represents USD Coin's circulating supply, BUSD represents Binance USD's circulating supply, DAI represents MakerDAO's decentralized stablecoin supply, TUSD represents TrueUSD's circulating supply, and BTC represents Bitcoin.**

Issuer Economics: The Float Model

As stablecoins have become embedded in on-chain settlement and liquidity flows, the economic model of their issuers has taken on increasing relevance, alongside greater regulatory attention.

The business model of stablecoin issuers resembles that of a narrow bank or money market fund. Issuers accept fiat deposits, invest reserves primarily in short-duration U.S. Treasuries or cash-like equivalents, and issue digital tokens that circulate on-chain. Users gain transactional utility, while issuers retain the yield generated on the reserve assets in most cases.

In higher interest-rate environments, this model can be highly profitable. Major stablecoin issuers have generated substantial interest income from the reserve float, helping to explain the growing participation of traditional fintech firms and regulated financial institutions seeking to compete in this on-chain market for digital dollars.

Table 4.1: Stablecoin Issuer Economic

	Float (Avg USDC)	Reserve Yield	Quaterly Reserve Income
Q1 2025	$54.1B	4.26%	$558M
Q2 2025	$61.0B	4.24%	$634M
Q3 2025	$67.8B	4.24%	$711M

Source: **Circle Internet Group public financial filings. Float multiplied by reserve yield approximates reserve income. Shown quarterly for USDC stablecoin issuer Circle.**

V — DeFi and Tokenisation: The On-Chain Financial System

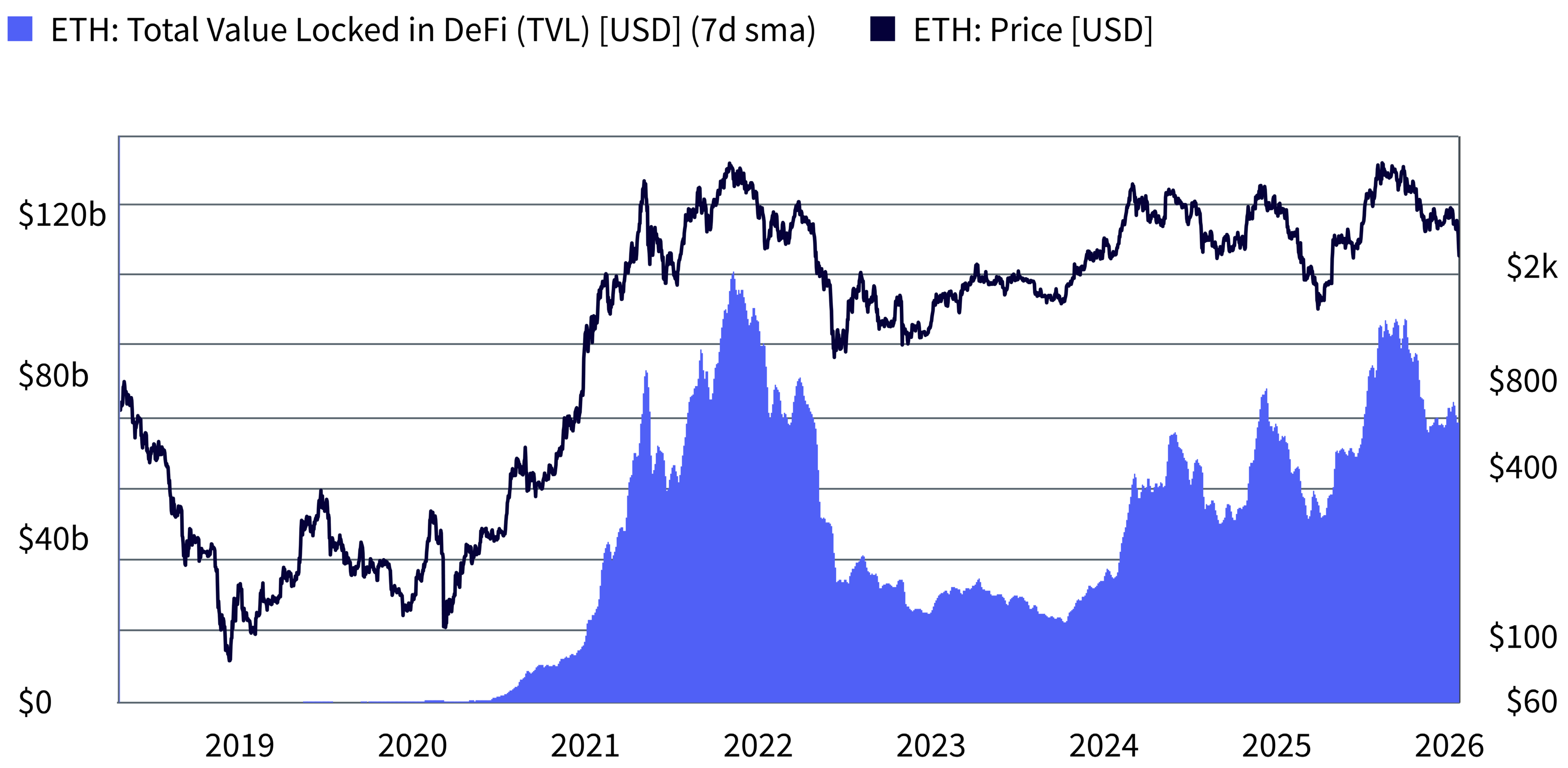
DeFi as the Financial Layer

Decentralised Finance (DeFi) represents the financial layer built on top of blockchain settlement and liquidity infrastructure. It enables core financial functions such as trading, lending, and collateralised borrowing through smart contracts rather than centralised intermediaries.

Economic activity in this layer is commonly measured by Total Value Locked (TVL), which serves as a proxy for capital deployed into on-chain financial applications. Following a sharp deleveraging in 2022, DeFi activity stabilised, and core protocols have continued to facilitate meaningful levels of trading and lending. This resilience reflects the durability of the underlying software infrastructure.

From a structural perspective, DeFi represents an alternative financial stack operating on open networks. While still evolving, it has demonstrated the capacity to support capital formation and financial activity at scale without reliance on centrally managed infrastructure offered by traditional companies.

Figure 5.1: DeFi Total Value Locked (ETH)



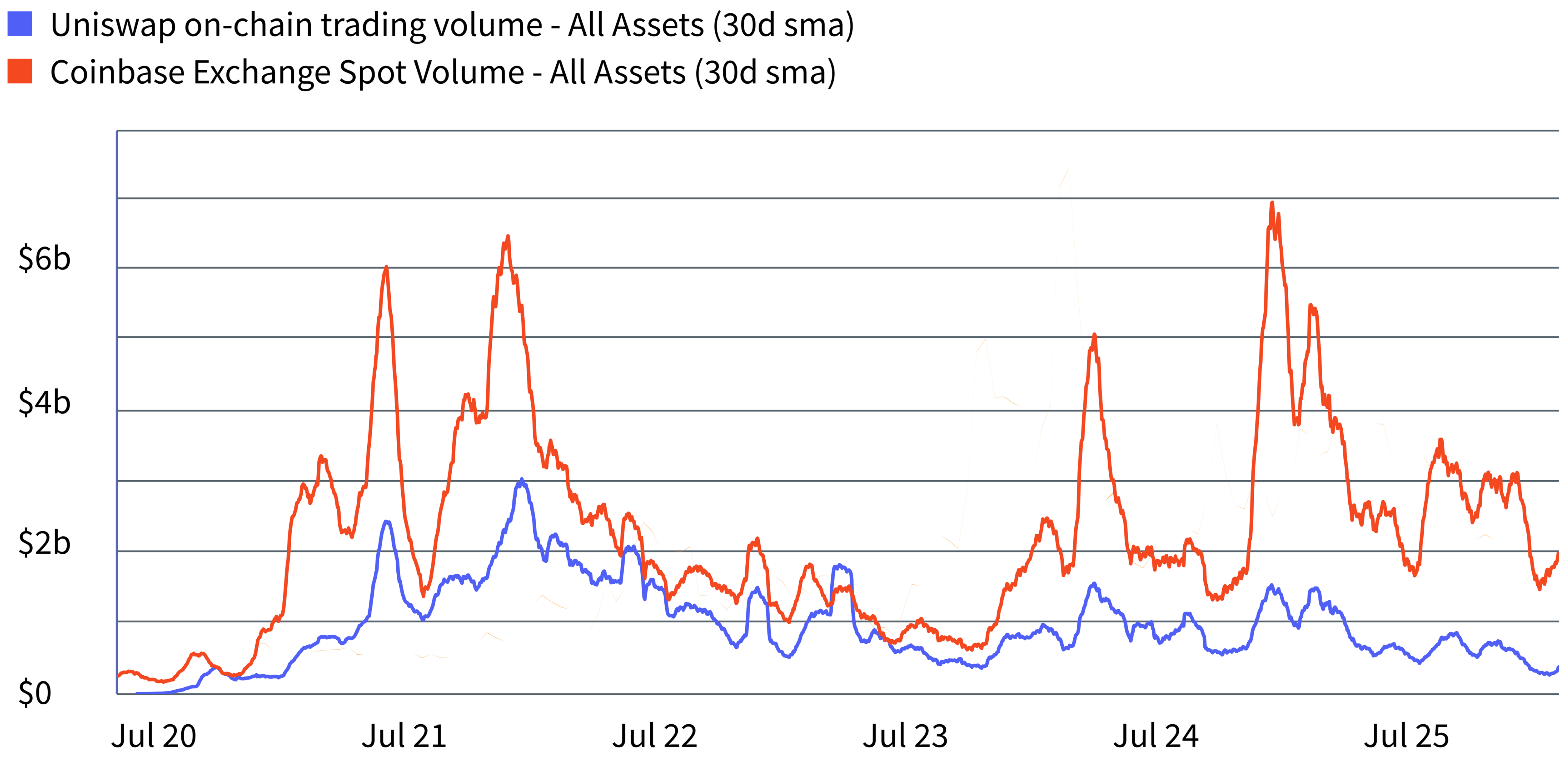
Source: **Glassnode. ETH represents EthereumTVL represents Total Value Locked, DeFi represents Decentralized Finance. Historical performance is not an indication of future performance, and any investment may go down in value.**

Market Structure: AMMs and On-Chain Credit

The defining architectural feature of DeFi is the replacement of discretionary intermediaries with autonomous, rules-based software. This shift is most evident in decentralised exchanges and lending protocols.

Automated Market Makers (AMMs) replace traditional order books with liquidity pools, enabling continuous, permissionless trading. Market making is embedded at the protocol level, allowing trades to execute without reliance on a centrally managed venue. Volumes are reaching scales competing with traditional exchanges.

Figure 5.2: Uniswap vs. Coinbase



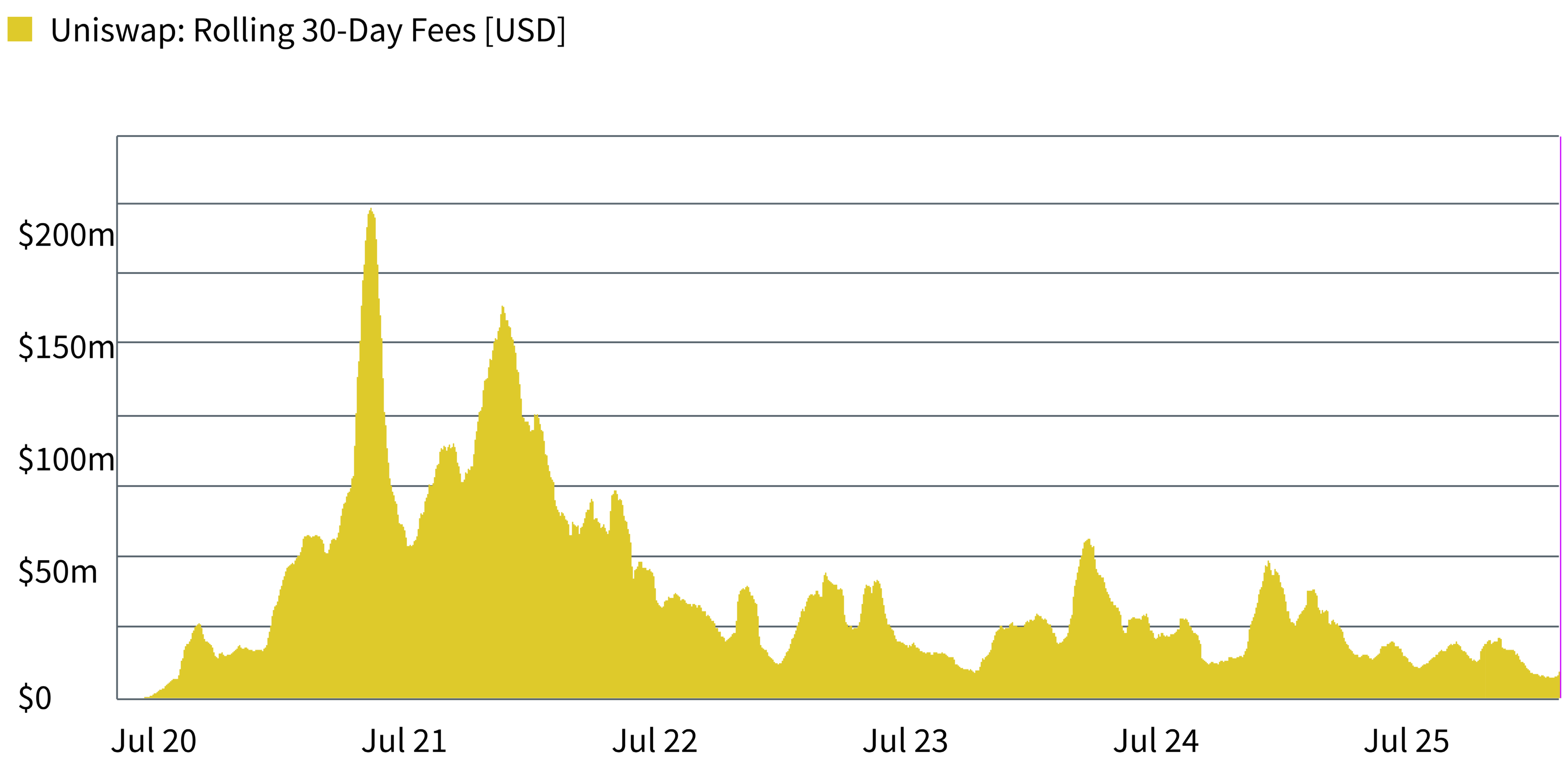
Source: Glassnode. Uniswap is a prominant decentralised exchange that operates as an automated market maker (AMM). **Historical performance is not an indication of future performance and any investment may go down in value.**

Fees generated by trading activity accrue directly to liquidity providers rather than to exchange operators or proprietary market makers, broadening access.

Lending protocols operate as autonomous money markets. Collateral requirements, liquidation thresholds, and interest rates are defined in code and adjust dynamically based on supply and demand. Credit allocation occurs transparently and continuously, without credit committees or balance-sheet constraints typical of traditional banking.

While decentralised platforms do not replicate all functions of traditional financial institutions, the data demonstrates that smart contract–based systems can support trading and credit activity at economically meaningful scale. As a result, traditional financial institutions have taken notice and have begun their own endeavors in exploring how they can leverage blockchain technology in their own operations.

Figure 5.3: Uniswap Rolling 30-Day Fees



Source: Glassnode. **Historical performance is not an indication of future performance and any investment may go down in value.**

Tokenisation and TradFi Integration

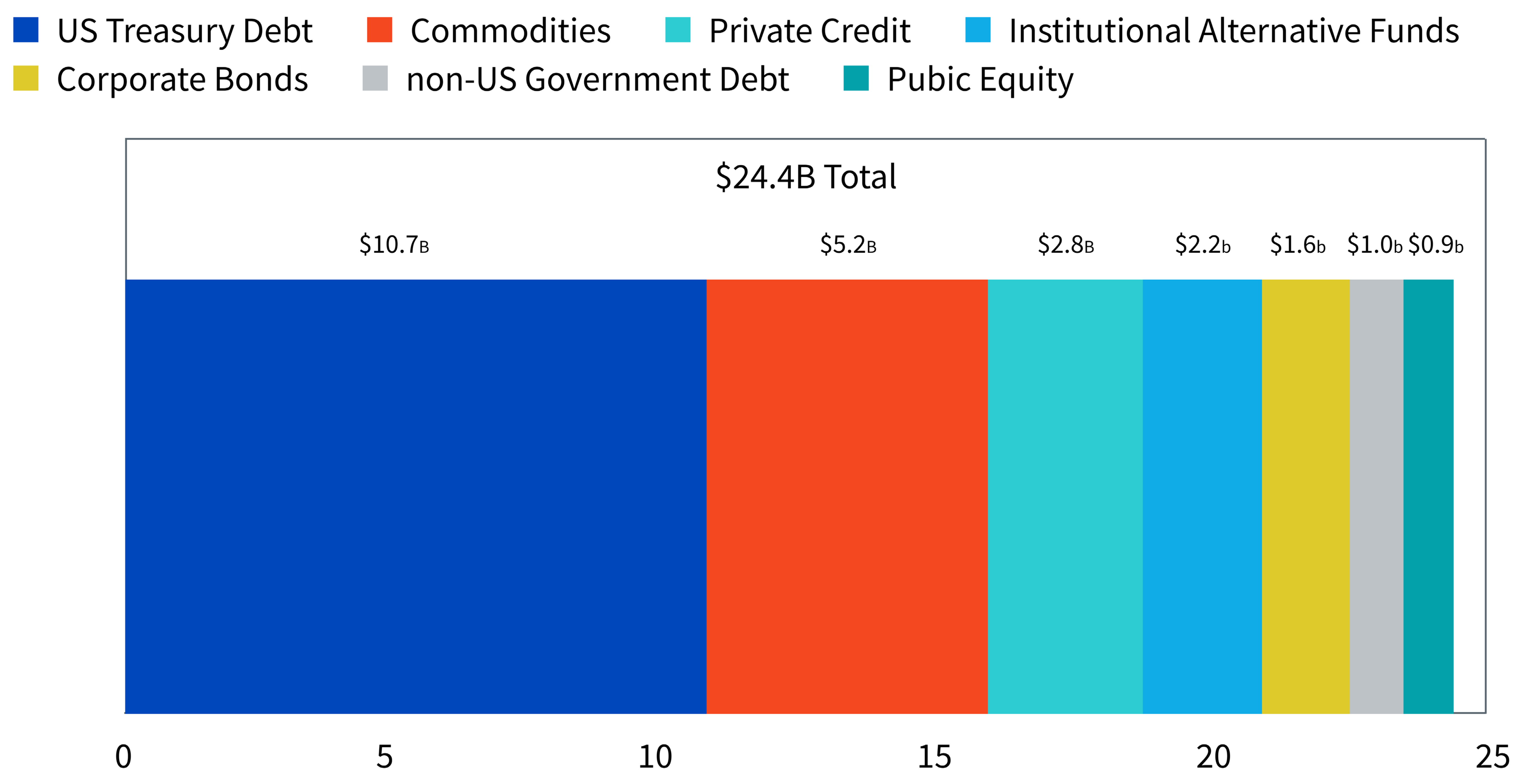
Tokenisation represents the primary interface between traditional finance and on-chain financial markets. It involves issuing digital representations of real-world assets, such as U.S. Treasury bills, commodities, or funds, directly onto blockchain networks.

This development allows high-quality, low-volatility collateral to be utilised within on-chain financial applications. In particular, tokenised Treasuries have enabled access to short-duration government yields while retaining on-chain settlement and programmability.

From an institutional perspective, tokenisation expands the range of assets that can participate in on-chain markets and strengthens the link between traditional capital markets and blockchain-based financial infrastructure.

It also introduces opportunities to streamline operational processes through automation and atomic settlement while enabling new forms of capital deployment.

Figure 5.4: Tokenised Assets by Category



Source: **RWA.xyz, www.app.rwa.xyz, as of January 2025**

Conclusion

The blockchain ecosystem has evolved into a layered economic system with identifiable infrastructure, settlement mechanisms, financial gateways, and on-chain markets. Activity across these layers is observable and governed by explicit economic incentives rather than institutional trust alone.

Transaction fees provide a lens into underlying network usage, while security is provisioned through economically funded mechanisms such as mining and staking. Exchanges, custodians, and stablecoins enable capital to move between traditional markets and on-chain infrastructure, supporting liquidity and settlement at scale. Built on this foundation, decentralised financial protocols and tokenised assets facilitate trading, lending, and capital deployment through rules-based systems.

For institutional investors, the relevance of blockchain lies not in speculation, but in its emergence as a parallel financial infrastructure that can be evaluated using familiar concepts such as costs, revenues, and capital formation. Understanding how these layers interact is now the central analytical task for evaluating the evolution of the blockchain economy.

Glossary

Automated Market Maker (AMM)
A decentralised trading mechanism that uses liquidity pools and algorithmic pricing instead of traditional order books to facilitate continuous trading.

Blockchain
A distributed, append-only digital ledger that records transactions across a network, providing a transparent and auditable record of economic activity without reliance on a central authority.

Blockspace
The scarce processing capacity of a blockchain used to execute transactions and smart contracts; the fundamental resource consumed by all on-chain activity and priced through transaction fees.

Decentralised Finance (DeFi)
Financial applications built on blockchain infrastructure that enable trading, lending, and borrowing through autonomous, rules-based smart contracts rather than centralised intermediaries.

Hashprice
The unit revenue metric for Proof-of-Work networks, representing the USD revenue earned per unit of computational power per day, reflecting both protocol rewards and market prices.

Hashrate
The aggregate computational power committed to validating transactions and enforcing settlement finality on a Proof-of-Work network.

Liquidity Provider
A participant who supplies assets to a decentralised trading or lending protocol in exchange for fees or yield.

Proof-of-Stake (PoS)
A capital-backed security model in which participants lock native assets as collateral to validate transactions, earn protocol-defined yields, and face penalties for misconduct.

Proof-of-Work (PoW)
An energy-backed security model in which participants convert computational work and electricity into cryptographic security for validating transactions and securing the ledger.

Protocol Revenue (Transaction Fees)
The aggregate transaction fees paid by users to access blockspace and have transactions processed and settled, serving as a direct indicator of demand for network utility.

Real-World Assets (RWA)
Traditional financial instruments, such as U.S. Treasury bills or commodities, represented as digital tokens to enable on-chain settlement and programmability.

Stablecoin
A digital settlement instrument pegged to a fiat currency, typically the U.S. dollar, and backed by reserves; it functions as the primary liquidity and settlement layer of the blockchain economy.

Tokenisation
The process of issuing digital representations of off-chain assets onto blockchain networks to enable on-chain settlement, automation, and broader capital participation.

Total Value Locked (TVL)
A proxy for capital deployment, representing the total value of assets deposited into decentralised financial protocols at a given point in time.

Validator
A participant in a Proof-of-Stake system responsible for validating transactions, maintaining ledger integrity, and contributing to network security.

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