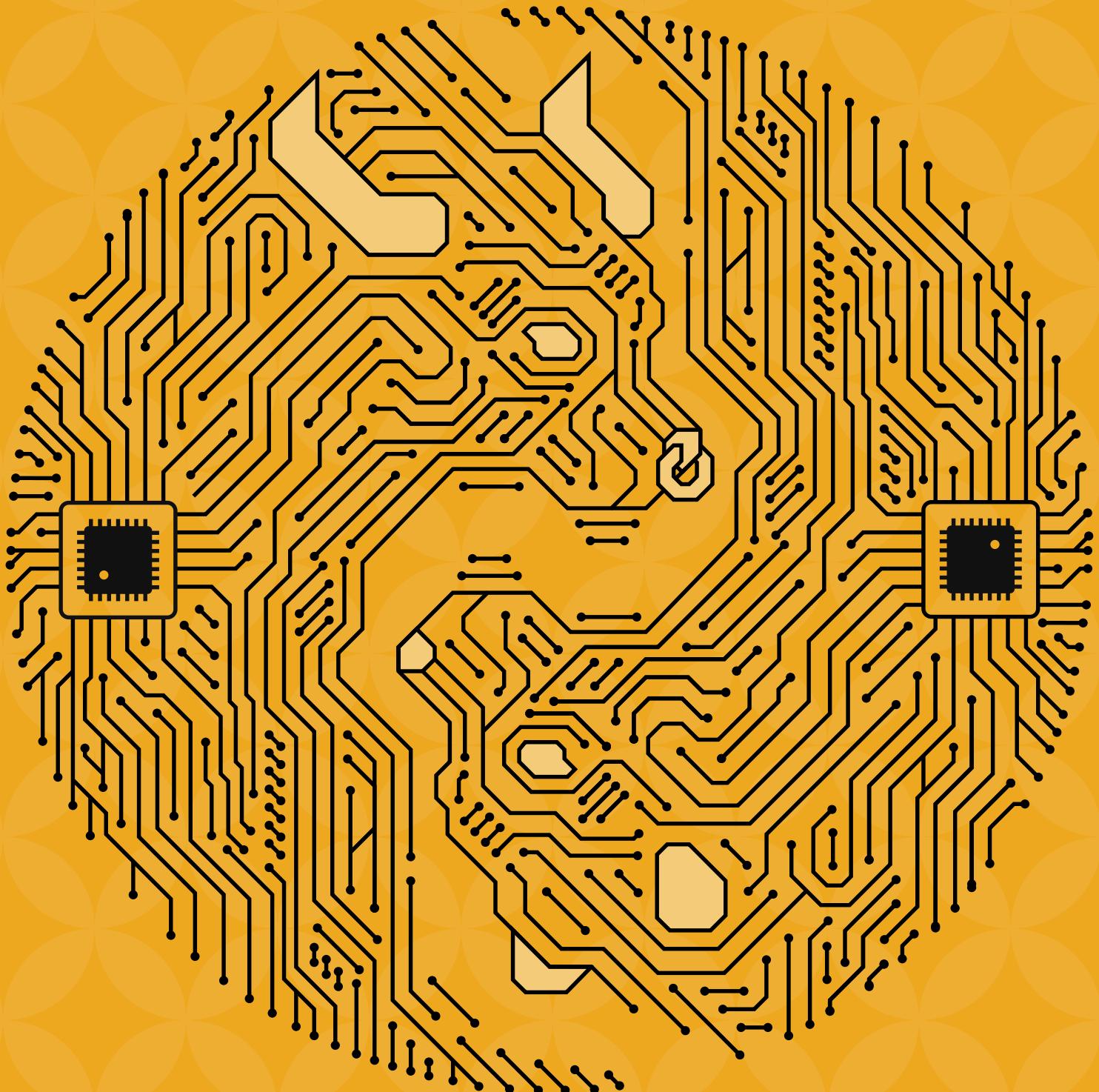


State of Crypto

Issue 13 / December 2024



Market Outlook 2025

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Introduction

Despite macroeconomic challenges in 2024, crypto and financial markets saw both opportunities and hurdles. A landmark event was the U.S. approval of Bitcoin Spot exchange-traded funds (ETFs), the most successful ETF launch in history. This milestone underscored the surge in institutional interest and solidified Bitcoin's standing as a legitimate global asset.

The Bitcoin Halving¹, ETF approvals in Hong Kong, and the U.K.'s opening of regulated crypto funds to professional investors added momentum. Yet, summer selloffs driven by major liquidations and geopolitical tensions tempered market enthusiasm. More recently, macro conditions have improved with easing inflation, and central banks and the Federal Reserve cutting interest rates, giving a lift to assets like Bitcoin.

Crypto's rising political significance in the recent U.S. elections has brought increased attention to the industry. Simultaneously, tokenization has gained traction as financial institutions experiment with permissionless blockchain technology, and stablecoins have sustained their strong product market fit with over \$170 billion in circulation².

Amid ongoing geopolitical uncertainty and economic challenges, positive catalysts continue to shape a promising outlook for crypto in the coming year.

We are excited to present our latest State of Crypto magazine—our 2025 market outlook—with our top 12 predictions for the year ahead.

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2025 Predictions

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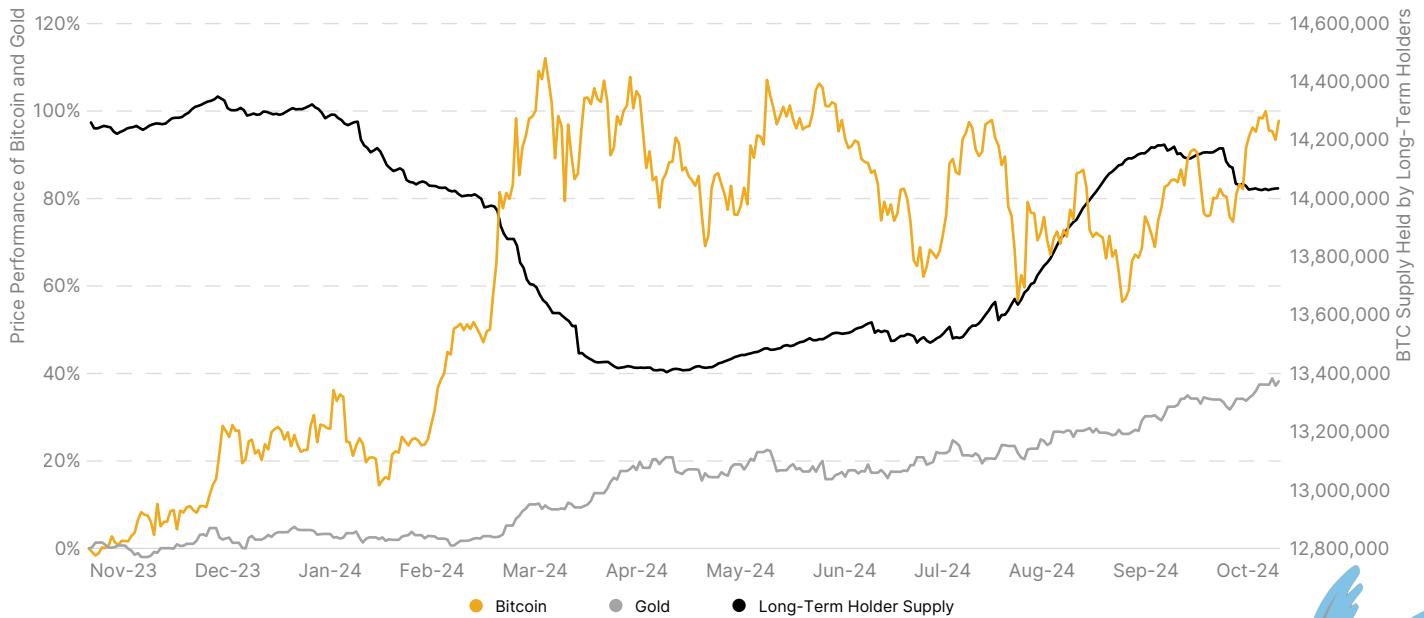
Another Nation-State Will Adopt Bitcoin as a Strategic Reserve Asset

In 2024, Bitcoin gained unprecedented political significance and continued its emergence as a store of value that allows institutions and nations globally to participate in its decentralized monetary system, offering a hedge against economic uncertainty and local currency debasement. For example, MicroStrategy³ has continued increasing its holdings, reporting unrealized gains of over \$8 billion. In 2025, we may see other institutions following MicroStrategy's lead, as evidenced by Japanese investment firm Metaplanet⁴, which has accumulated 855 Bitcoin as a hedge against the depreciation of the JPY. Following El Salvador, Bhutan⁵ utilized its hydroelectric power for Bitcoin mining, earning \$800 million. Additionally, Russia⁶ has reversed its stance by legalizing Bitcoin mining and international crypto payments. **We're witnessing a clear shift, as nation-states increasingly embrace the Bitcoin standard. That being said, in 2025, we expect to see countries like Argentina adopt**

Bitcoin as a strategic reserve asset. Argentina aims for a zero-debt budget by 2025; therefore, a crypto-forward agenda and President Milei's collaboration with El Salvador's President Nayib Bukele may signal broader Bitcoin adoption. Even in the U.S., the possibility of holding Bitcoin as a strategic reserve asset has been picked up⁷ during the presidential race, given that the Department of Justice⁸ already holds 208K confiscated BTC, worth approximately \$19 billion.

Escalating geopolitical tensions may pose challenges for Bitcoin in the short term. However, given rising concerns about soaring U.S. government debt and a looming debt crisis in China, it's no surprise that a growing number of institutions and nations are turning their attention to store of value assets like Bitcoin and gold. Both assets are likely to reach new all-time highs in 2025.

Figure 1 – Gold vs. Bitcoin's Price Movement vs LTH Supply: Long-term BTC holder supply steadily rising since mid-2024, indicating growing commitment from long-term investors despite price volatility.



Source: 21Shares, Gold Prices, Glassnode. Data as of October 24, 2024

Bitcoin's Scalability Solutions Will Drive Total Value Locked to \$10 Billion

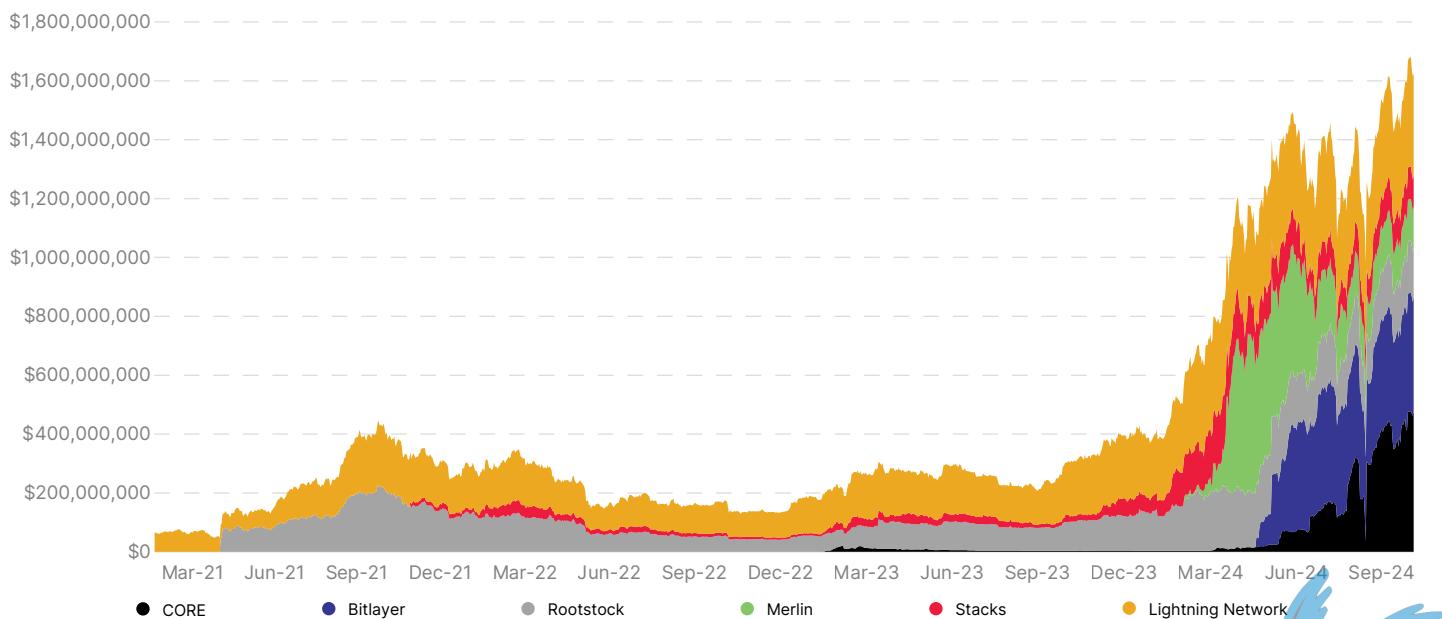
While Bitcoin has traditionally faced limitations in programmability, the congestion of the Layer 1 (L1) network and demand for applications have made Bitcoin scaling solutions more relevant. These layer-2 solutions extend Bitcoin's capabilities beyond simple transactions, addressing challenges in scalability, speed, and its native inability to support complex smart contracts.

One particularly exciting project is Stacks—a scalability solution that boosts transaction speed by up to 120x and introduces robust smart contract functionalities. By anchoring to Bitcoin's blockchain, Stacks leverages Bitcoin's unparalleled security and immutability while enabling a new ecosystem of decentralized applications (dApps) that maintain Bitcoin's integrity without sacrificing scalability or programmability. The recent Nakamoto Upgrade⁹ for Stacks is poised to catalyze this vision in 2025, introducing true Bitcoin-finality and rapid block

times comparable to Ethereum L2 solutions. Additionally, it introduces sBTC¹⁰, a native derivative unlocking utility for more than \$1 trillion¹¹ in idle capital, setting the stage for advanced DeFi applications.

Bitcoin's ecosystem has also gained new momentum with OP_CAT¹² and BitVM¹³, both features that enhance scripting, smart contract capabilities, and scalability, without altering Bitcoin's core consensus. These advancements, though still in early stages, have catalyzed a wave of new projects in 2024, with more anticipated in the coming year as developers race to scale Bitcoin's functionality. Currently, the total value locked (TVL) in major Bitcoin scalability solutions stands at around \$1.7 billion. **We anticipate Bitcoin's TVL to grow beyond \$10 billion in 2025, establishing Bitcoin's broader utility beyond a store-of-value.**

Figure 2 – Major Bitcoin Scalability Solutions by TVL



Source: 21Shares, DeFiLlama. Data as of October 24, 2024



Ethereum's Revenue Renaissance Will Begin in 2025

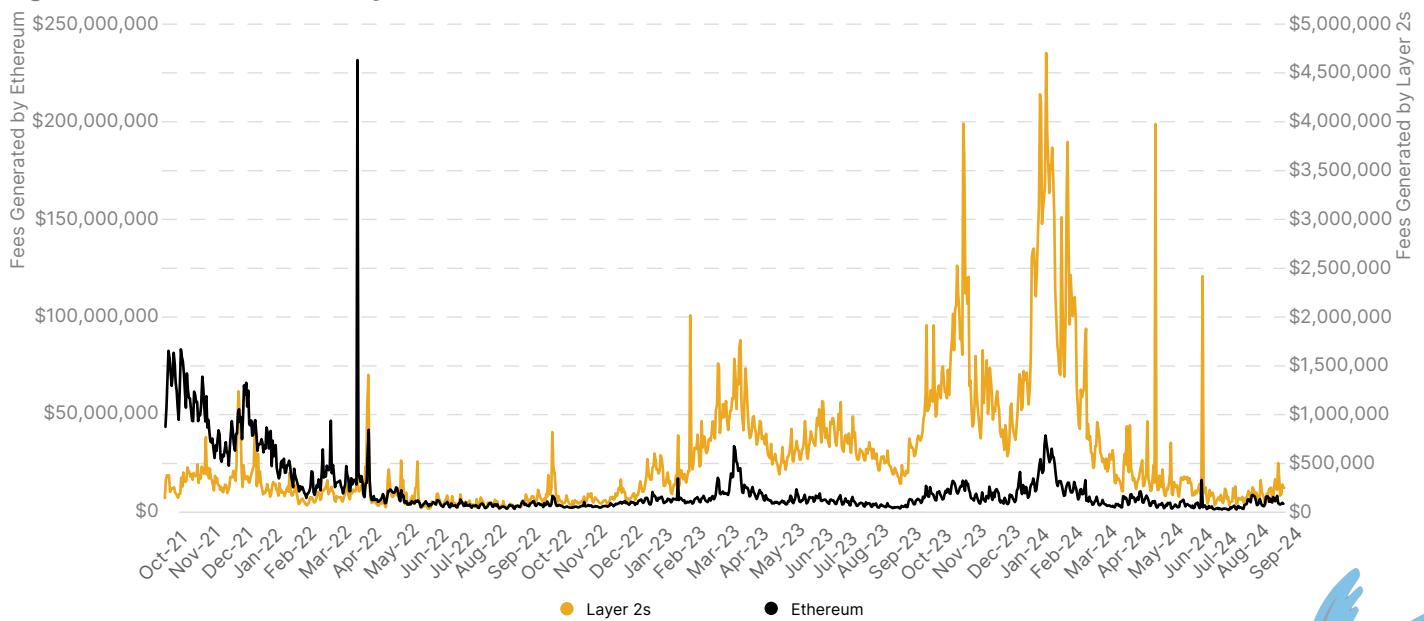
Ethereum faced significant challenges in 2024, as both users and capital flowed toward Layer 1s like Solana and Sui. At the same time, Ethereum's revenue fell short of previous years, with Layer 2s like Optimism and Arbitrum capturing a growing share of the market. While L2s alleviate Ethereum's congestion and fees by handling transactions off-chain, they also reduce fees flowing to the mainnet, raising concerns about Ethereum's long-term economic model. EIP-4844, known as 'Proto-Danksharding'¹⁴, marked a pivotal upgrade by introducing 'BLOB space'—a novel method for Ethereum to store large data blobs (such as transaction data) more efficiently, helping to scale the network by making it faster and cheaper to use. However, while L2s' rapid growth is pulling users from Ethereum's L1, at times making it appear underutilized, the outlook isn't entirely bleak.

By 2025, we expect Ethereum to regain its revenue levels, driven by increased demand for BLOB space, likely surpassing 100% of its target growth due to strategic L2 integrations. As these L2 solutions onboard the next wave of crypto users, they will funnel more fees back to Ethereum's mainnet, boosting demand and supporting Ethereum's long-term growth. Potential adjustments, such as raising minimum

BLOB fees¹⁵ and introducing revenue-sharing agreements with L2 networks, could reinforce Ethereum's economic dynamics and sustainability.

The broader Ethereum ecosystem will also benefit from alternative L1 networks transitioning into Ethereum L2s, with networks like Celo¹⁶ and Sonic¹⁷ (formerly Fantom) building bridges to operate as L2s. Additionally, as we see more app and sector-specific chains, such as Uniswap's Unichain, liquidity should become less fragmented, bringing users back to the Ethereum ecosystem. Meanwhile, traditional companies are following the path of crypto-native firms like Kraken and Coinbase, which have successfully launched their own L2s, as seen with Coinbase's Base generating over \$60 million¹⁸ in revenue and capturing \$2.5 billion¹⁹ in total value locked (TVL). Legacy players like Sony have begun launching and exploring L2s, signaling deeper Web3 engagement. **Looking ahead, Web2 firms like Robinhood and PayPal, along with traditional finance entities like Visa, are likely to launch their own L2s, leveraging cost-efficiency and scalability to unlock new revenue streams and serve a growing demand for decentralized applications.**

Figure 3 – Ethereum Fees vs. Layer 2 Fees



Source: Artemis

4

ETPs Will Drive Further Institutional Adoption, Reaching \$250 Billion in Assets Under Management Globally

On January 10, 2024, the SEC made a landmark decision by approving Spot Bitcoin ETFs in the United States. Within just a few months of their launch, these ETFs attracted over \$20 billion in net new assets, marking the most successful ETF launch in financial history—surpassing even the early performance of gold ETFs. A few months later, Ethereum ETFs also gained approval.

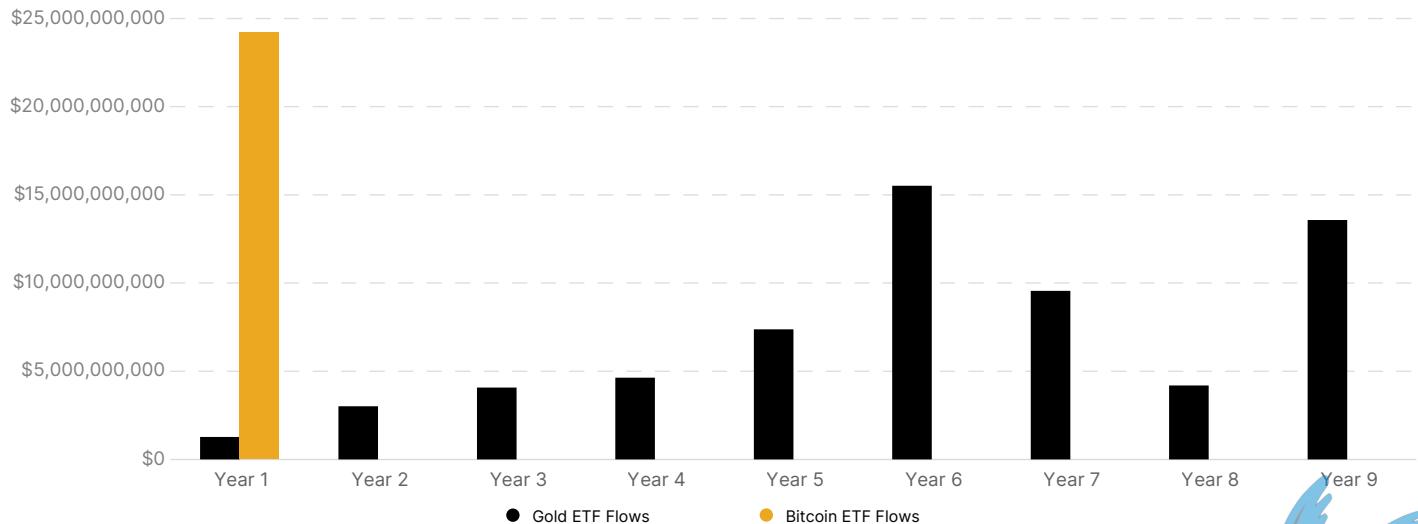
In the U.K., the FCA approved Bitcoin and Ethereum ETNs for professional investors, further expanding institutional access. Meanwhile, Hong Kong introduced six spot ETFs for Bitcoin and Ethereum. By October 15, 2024, the global assets under management (AUM) for crypto ETPs reached approximately \$100 billion.

While retail investors currently account for nearly 80% of inflows, institutional demand is growing, with investment

advisors and hedge funds emerging as some of the fastest-expanding groups showing interest. Looking ahead to 2025, institutional adoption is expected to accelerate as the one-year due diligence period wraps up in January, lifting restrictions that have so far prevented registered investment advisors and wirehouses in the U.S. from advising clients on Bitcoin Spot ETFs. Additionally, the approval of options on Bitcoin ETFs will deepen market liquidity, allowing institutional investors more tools for managing risk, which should appeal to a broader base of traditional investors. **Considering these factors, we anticipate that global crypto ETPs could reach \$250 billion in AUM, with at least one U.S.-based Bitcoin ETF likely to rank among the top 25 largest ETFs worldwide.**

Figure 4 – Gold vs. Spot Bitcoin ETF Flows: Despite potential influences from M2 money supply, inflation, and market accessibility, Bitcoin ETFs have undeniably outperformed Gold ETFs in demand during their first year of trading

\$30,000,000,000



Source: 21Shares, Bloomberg. Data as of October 31, 2024

5

Solana Will Continue to Eat Ethereum's Market Share, Reaching an All-Time High in Total Value Locked

In 2024, Solana made significant inroads into Ethereum's market share, with net inflows of \$1.2 billion and over \$2 billion²⁰ transferred directly from Ethereum to Solana. Solana's high speed and low fees drew users, with Solana's DEXs, notably Raydium, surpassing Uniswap in March 2024, handling over \$60 billion²¹ in volume. With transaction costs as low as \$0.0008²² and an average of 2,430²³ transactions per second (TPS), Solana's performance led to a noticeable market shift. Despite most of the volume coming from memecoin trading, which makes up more than 75%, Solana still scored a clear win in attracting new users and drawing capital from other networks. **While we don't anticipate a full "flippening", Solana is primed to outperform and capture more market share from Ethereum through improved UX and infrastructure.**

Solana's integration into TradFi accelerated with PayPal's PYUSD stablecoin processing \$13 billion²⁴ and partnerships with Visa, Shopify and Stripe enabling crypto payments. Looking forward to 2025, key announcements from Solana's conference Breakpoint 2024 forecast continued growth:

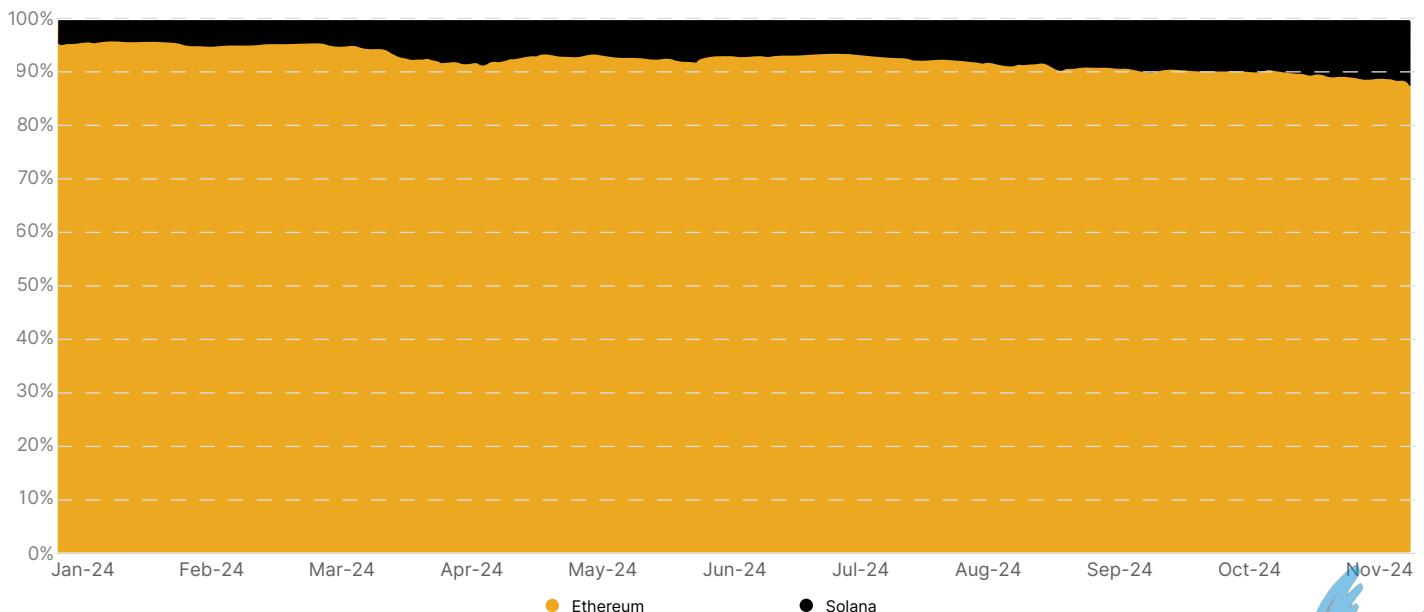
- Franklin Templeton will launch its OnChain U.S. Government Money Market Fund on Solana²⁵, marking a major institutional tokenization move.

- Tokenization platform Securitize is adding native support for Solana²⁶.
- Société Générale is expanding its EURCV stablecoin to Solana²⁷ due to its scalability and cost-efficiency.

However to successfully support TradFi integrations, Solana must resolve network outages and failures, which haunted them in the past, but technical advancements are well underway. Firedancer, a new validator client software that demonstrated over 1 million TPS on testnet²⁸, launches in 2025 and is set to boost Solana's resilience, throughput, and validator diversity.

Lastly, Solana's expanding role in TradFi is expected to set the stage for traditional financial products such as Solana futures on the CME or U.S.-domiciled Solana ETFs. While ETF approval may not happen in 2025, the likelihood is expected to increase as we approach the end of the year and into the first half of 2026.

Figure 5 – Solana vs. Ethereum TVL Market Share



Source: 21Shares, Artemis. Data as of October 24, 2024

6

User-Friendly Layer 1s Will Drive the Growth of the Next Generation of Smart-Contract Platforms

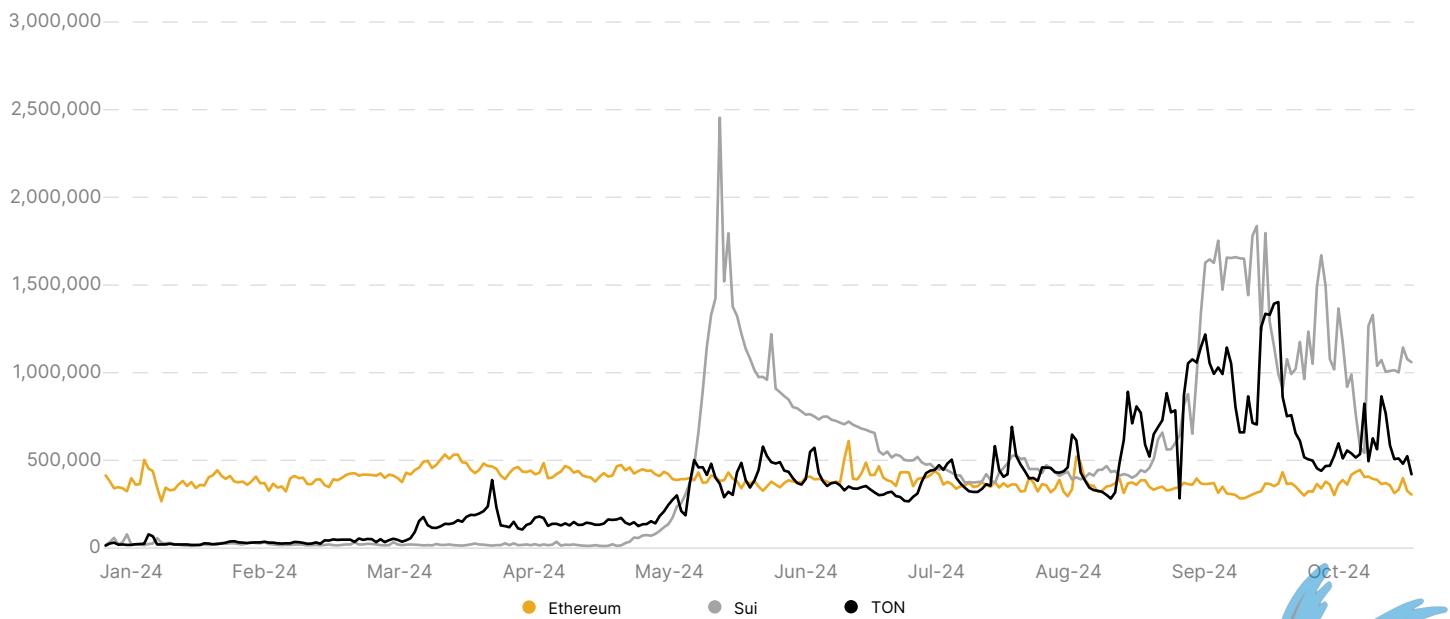
Ethereum, holding about 55%²⁹ of TVL across chains, faces slowing growth as user-friendly Layer 1s like Sui and The Open Network (TON) gain momentum, as shown in Figure 6. Similar to Solana, these L1s offer faster, cheaper, and more intuitive experiences compared to Ethereum's more complex ecosystem. While Ethereum remains the secure choice for high-value assets (like tokenized government securities, accounting for \$1.7 billion³⁰ in TVL), streamlined L1 solutions are drawing users with Web2-like accessibility for less security-intensive use cases.

Looking to 2025, we believe alternative L1 networks will make significant strides in client-facing applications, surpassing Ethereum in new user adoption. Sui is positioned to grow its user base significantly through partnerships with

Web2 gaming platforms like Steam, as it plans to launch the SuiPlayOX1³¹, a handheld gaming device. This approach mirrors Solana's Saga Phone³², targeting mainstream adoption with user-friendly, accessible blockchain interactions.

TON's ecosystem, linked to Telegram's 900 million users, is anticipated to keep expanding. Since the launch of USDT on the network, TON's stablecoin supply surged to over \$1 billion³³ in 6 months, likely to surpass \$3 billion. With the expansion of its DeFi offerings through the Curve integration and the facilitation of native Bitcoin transfers³⁴, TON's use of Telegram Mini Apps simplifies crypto engagement within the messaging platform, further solidifying user loyalty despite recent regulatory pressures against Telegram.

Figure 6 – Daily Active Addresses Across Ethereum, Sui and TON



Source: 21Shares, Artemis. Data as of October 24, 2024



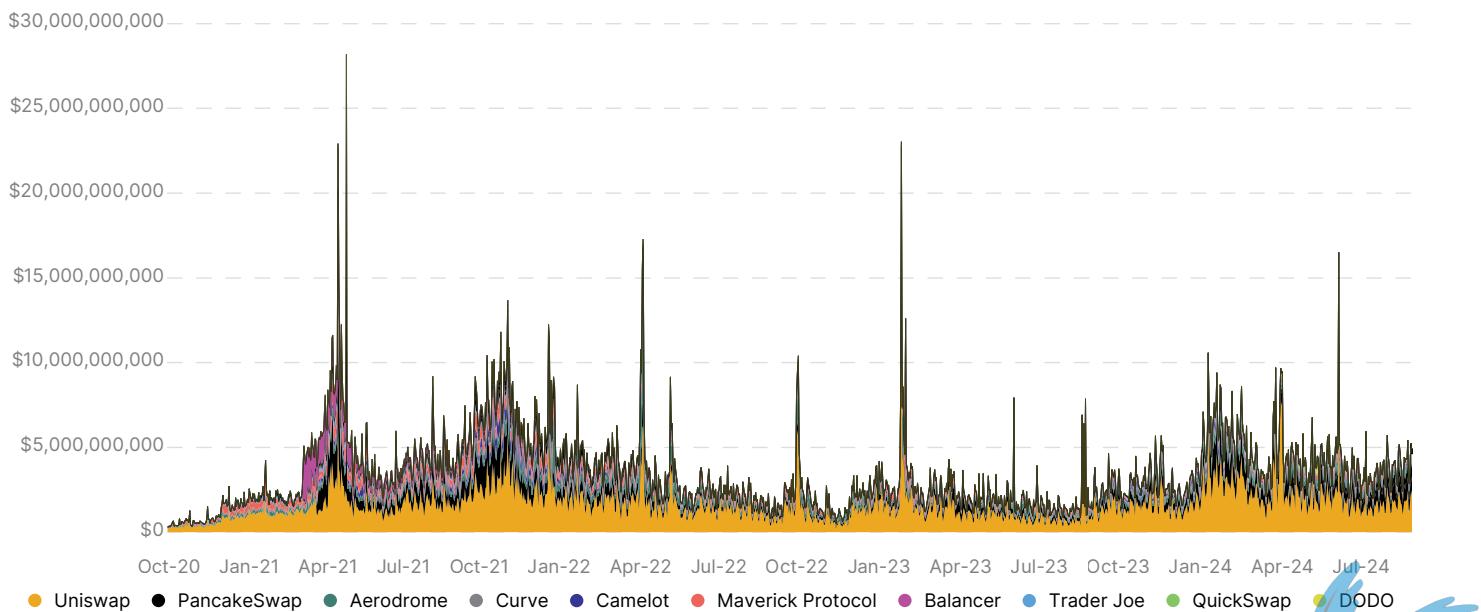
Revenue-Sharing Will Completely Change the Investment Case for DeFi

Crypto went through ups and downs over the last decade, with many projects and narratives fading. One sector, however, has remained robust: DeFi. Applications like Aave, Maker, Lido, and Uniswap have kept their leading positions even in bear markets or after expired incentive programs, thanks to their strong product-market fit. However, these protocols have historically struggled to make their tokens attractive investments, as they've solely offered governance rights without accruing any real value back to token holders.

That could change in 2025, especially with Trump's support for DeFi and the less stringent regulatory regime accompanying

the new administration. For instance, Uniswap's recent announcement of Unichain³⁵—a sector-specific chain—brings not only technical advantages but also a fundamental shift in UNI's token economics. By transforming UNI from a governance token into a utility token, Unichain could dramatically improve UNI's investment case. **We anticipate that greater regulatory clarity could drive a shift next year, with more DeFi projects adopting fee-sharing mechanisms and incentive structures, reshaping the DeFi investment landscape and attracting more investors in 2025.**

Figure 7 – Volume of leading DEXs



Source: 21Shares, Dune Analytics. Data as of October 24, 2024

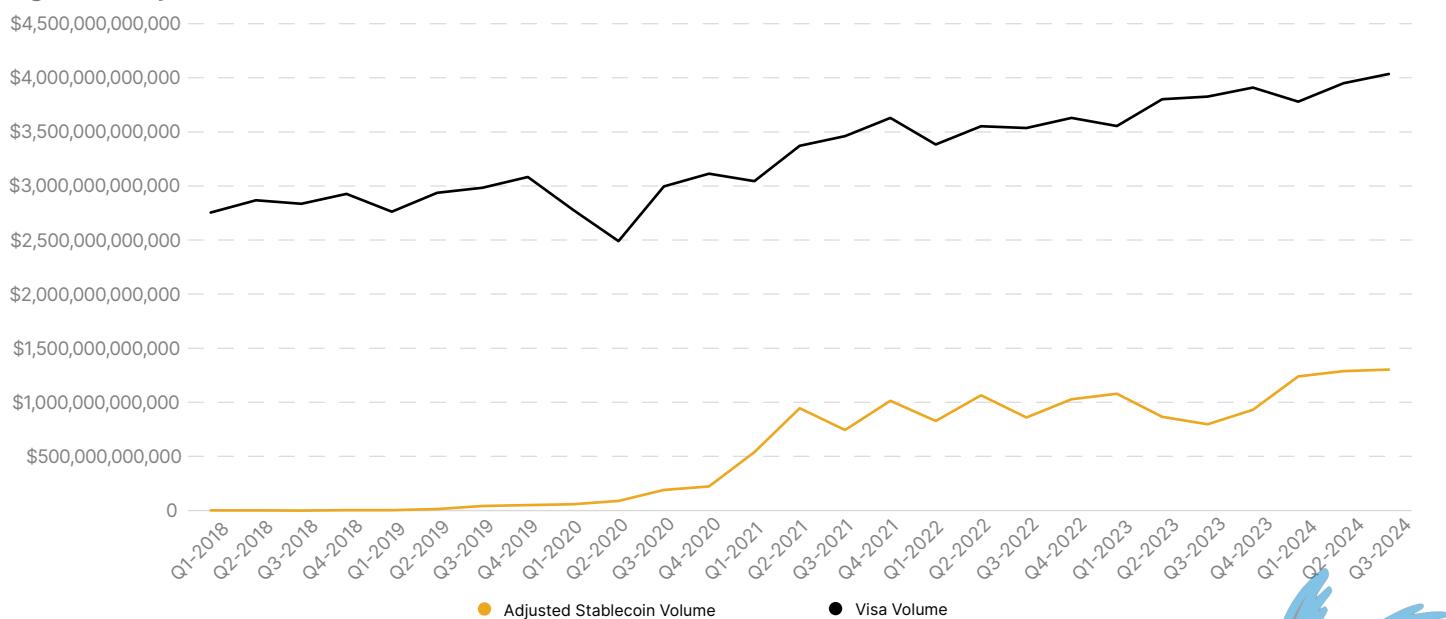
8

Stablecoins to Deepen Integration Across Traditional Sectors

Stablecoins represent one of crypto's most compelling use cases, showcasing an ideal product-market fit. In 2024, stablecoins reached an all-time high of over \$170 billion in market cap, cementing their role in the on-chain ecosystem. Globally, stablecoin adoption has surged. In the Philippines, stablecoins³⁶ are set to reduce costs in the \$34-billion remittance market³⁷, while Turkey's adoption has reached 5% of its GDP³⁸. With new stablecoin initiatives underway in the UAE³⁹ and Thailand⁴⁰, stablecoins are increasingly critical in financial systems⁴¹. In the EU, regulatory clarity from the MiCA framework is anticipated to boost euro stablecoins, potentially accelerated

by the anticipated delisting of non-compliant USDT. In the U.S., stablecoins are poised to support dollar dominance, as investors seek yields amid low interest rates and rising debt, bolstering demand for digital dollars and national debt alike. Additionally, Stripe's recent acquisition of stablecoin infrastructure provider Bridge⁴² highlights the growing integration of stablecoins within traditional finance. **Looking ahead, we expect growing adoption of stablecoins by nation-states, banks, and established Web2 companies, either through deeper integrations or the launch of proprietary solutions, marking a significant shift toward mainstream acceptance across traditional sectors.**

Figure 8 – Adjusted Stablecoin Volume vs. Visa Volume



Source: 21Shares, Visa. Data as of October 24, 2024



Tokenization to Advance in Private Credit

In 2024, asset tokenization surged, with government securities growing 155%⁴³ amid high interest rates. As rates fall, we expect a shift in focus toward private credit.

Tokenization could address three major barriers to private credit investment highlighted in a 2023 Coalition Greenwich survey⁴⁴: illiquidity, high management fees, and lack of transparency. By simplifying trading and expanding access, tokenization improves liquidity. Smart contracts streamline operations, cutting back-office costs and consequently lowering fees. Additionally, public blockchains and real-time settlement increase transparency, fostering trust in a market expected to grow at a 17% CAGR over the next five years.

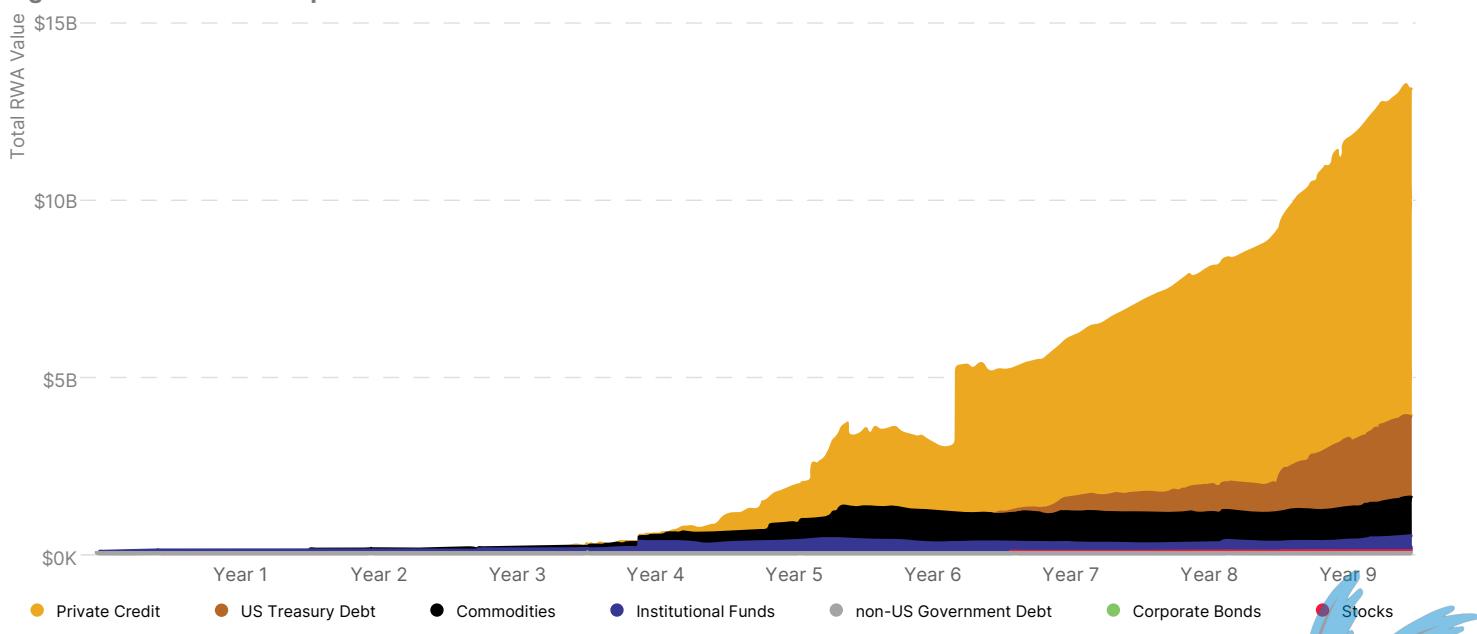
A key advancement for the tokenized private credit market will be integrating established rating agencies like Moody's. By offering detailed risk assessments for mid- to high-risk corporate debt, these agencies can enhance transparency around credit

quality and support the sector in meeting potential regulatory requirements. This integration is essential for a market currently lacking standardized risk metrics and clear benchmarks for creditworthiness.

The private credit sector is seeing rising interest, as shown by growing loan volumes on private debt-focused platforms. For instance, Maple Finance reached an all-time high of \$654 million in TVL⁴⁵ while Centrifuge's outstanding loans grew by 240% over the last two years, reaching \$255 million⁴⁶. These protocols cater to businesses underserved by traditional banks, making the crypto market—with its higher risk tolerance—a better fit for their financing needs.

In conclusion, while other tokenization sectors are also set to grow in 2025, we anticipate private credit to emerge as the fastest-growing subsector.

Figure 9 – Total Market Capitalization of Tokenized Assets



Source: 21Shares, RWA.xyz. Data as of October 24, 2024

10

Many Jurisdictions to Reconsider Retail Crypto Ban, as More Investor Protection Comes into Effect

In the U.S. — Clearer crypto regulations ahead

Following the launch of Bitcoin and Ethereum ETFs and the eToro settlement⁴⁷, U.S. regulators appear to be shifting towards tailored crypto regulations. The SEC's recognition of its missteps⁴⁸ and the advancement of legislations like the FIT21 Act⁴⁹ could pave the way for more clarity. Further, the potential repeal of SAB121 along with the reversal of the damaging effects of Operation Chokepoint 2.0 could see more traditional institutions service the crypto industry. Additionally, with a more relaxed regulatory environment, we could see the launch of ETFs for the longer tail of cryptoassets.

With USD-pegged stablecoins now the 16th largest holder of U.S. debt, regulations like the Lummis-Gillibrand Act⁵⁰ could expand stablecoin adoption and reinforce dollar demand. These trends are expected to multiply with a Trump Administration in January, while prioritization of crypto legislation can be at risk due to external factors such as the geopolitical conflicts and other more urgent matters.

In Europe — MiCA and institutional interest grow

The MiCA regulation, effective in December 2024, offers clarity over stablecoins and Cryptoasset Service Providers (CASPs),

potentially attracting projects to the EU. With the European Commission exploring crypto's inclusion in UCITS⁵¹, which is a €13 trillion market, investor access to regulated crypto products could see significant growth.

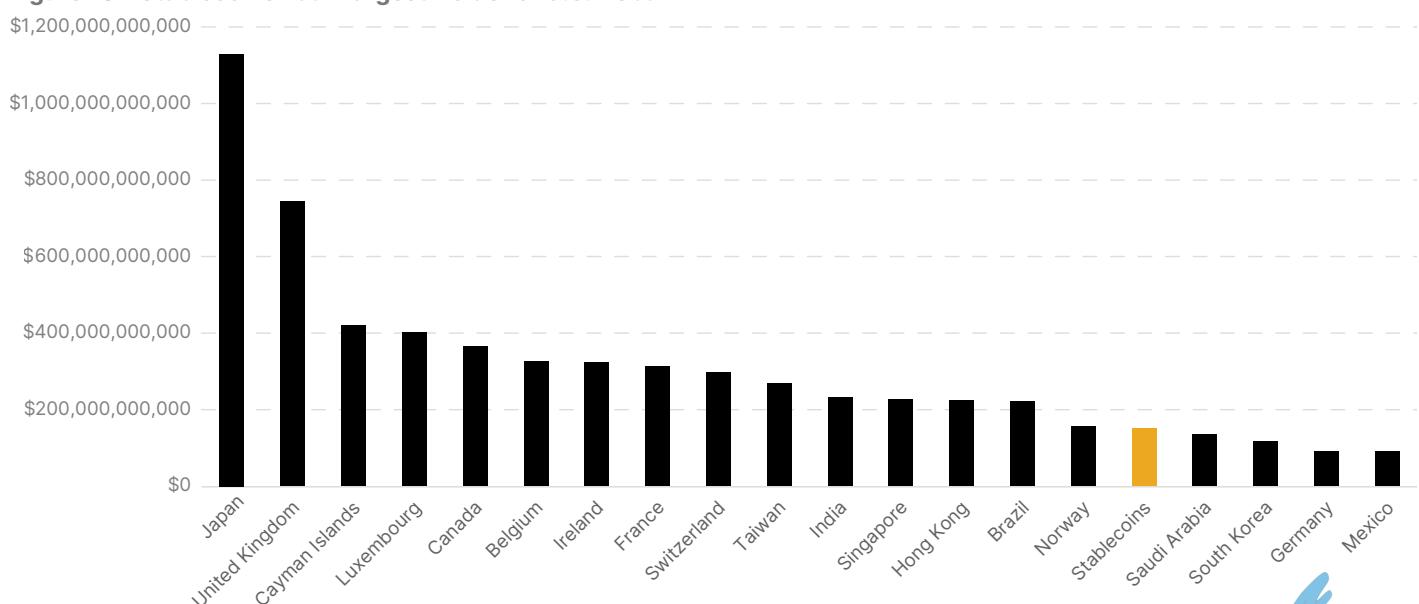
In the U.K. — Potential retail access to crypto ETNs

Currently, Bitcoin and Ethereum ETNs are limited to U.K. professional investors, but with rising crypto demand, a retail option may emerge in 2025. Additionally, the U.K.'s Property Bill⁵², which classifies crypto as personal property, solidifies investor protections and moves the U.K. closer to its goal of becoming a crypto hub.

In Asia — Growing appetite and progressive frameworks

In South Korea, the FSC is considering lifting the crypto ETF ban⁵³ as crypto trading volumes soar, exceeding \$456 billion⁵⁴ in Q1 2024. Meanwhile, Dubai remains a crypto magnet, attracting over 550⁵⁵ companies with tax benefits and regulatory clarity, further fueling growth across the Arabian Gulf.

Figure 10 – Stablecoins 16th Largest Holder of U.S. Debt



Source: 21Shares, Tagos. Data as of October 25, 2024

As the crypto market is constantly evolving, we've included two bonus predictions to highlight exciting emerging subsectors that we believe will be highly relevant in 2025.



Decentralized Broadband Solutions to Maintain Their Momentum

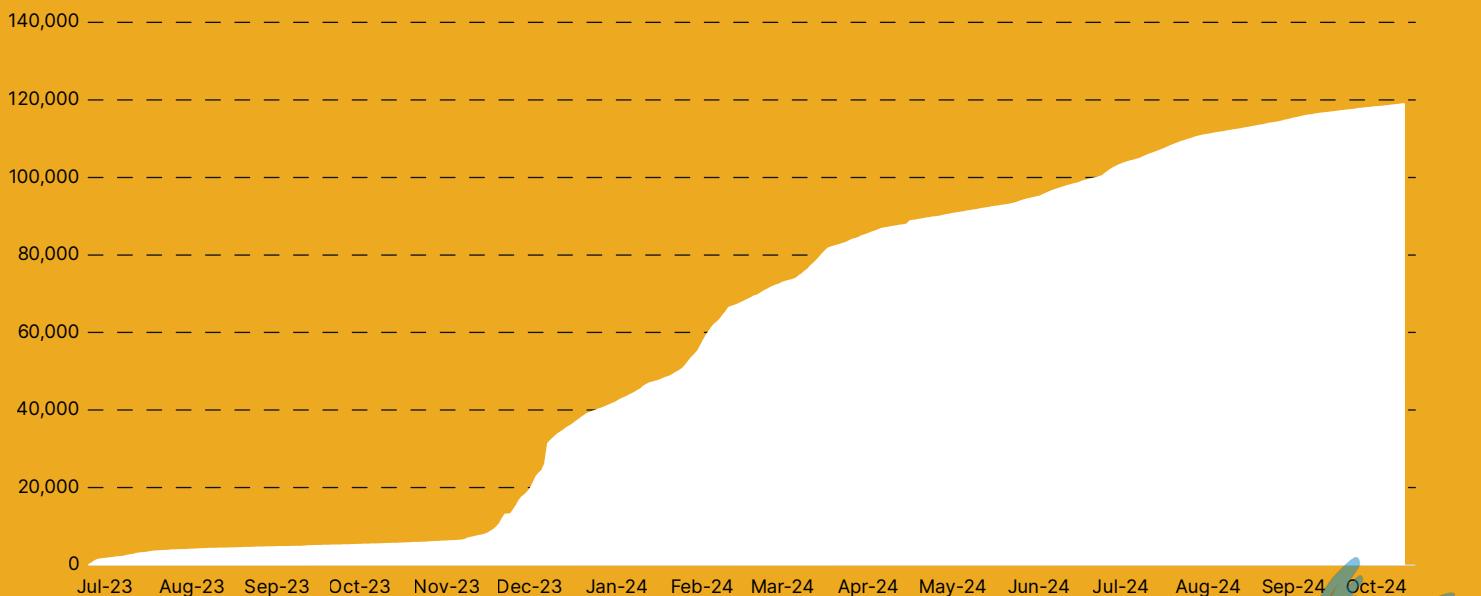
Currently, our internet infrastructure is controlled by centralized cellular data providers, resulting in high costs and often limited coverage. Helium, a decentralized wireless network leveraging the Solana blockchain, is transforming telecommunications by enabling individuals to set up affordable, long-range hotspots that expand coverage. As of October 2024, Helium operates on over 350,000 hotspots worldwide, bypassing the need for costly cell towers⁵⁶ (which can reach up to \$135,000⁵⁷) and bringing affordable connectivity to underserved areas. Ultimately, the network aims to create a more accessible, global internet at a fraction of traditional costs.

In early 2024, Helium Mobile introduced monthly mobile plans offering unlimited talk, text, and data for just \$20/month⁵⁸.

This accessible pricing has driven rapid adoption, with around 120,000⁵⁹ signups as of October 2024, a 385%⁶⁰ increase in users, echoing the early days of broadband adoption in the U.S. **Looking ahead to 2025, we expect decentralized broadband solutions to maintain their momentum.**

Helium is part of the DePIN (Decentralized Physical Infrastructure Network) sector, which leverages blockchain for community-managed infrastructure. In this model, individuals contribute resources and earn tokens, reducing costs and increasing efficiency by removing intermediaries, ultimately making services more affordable. We expect DePIN to see notable growth in 2025, with platforms like Peaq and IoTeX contributing to the sector's adoption.

Figure 11 – Number of Helium Subscribers



Source: 21Shares, Dune Analytics. Data as of October 25, 2024



Blockchain to Emerge as AI's Watchdog, Safeguarding Digital Truth

Over the past year, the AI sector has been a major force driving significant advancements and creating new opportunities across various industries. However, these developments are not without challenges. AI can introduce problems such as deepfakes and other manipulations, making it increasingly difficult to trust and verify data on the internet. By leveraging blockchain technology, we can enhance data integrity and verification in the age of AI, ensuring greater security and trust in our increasingly digital world.

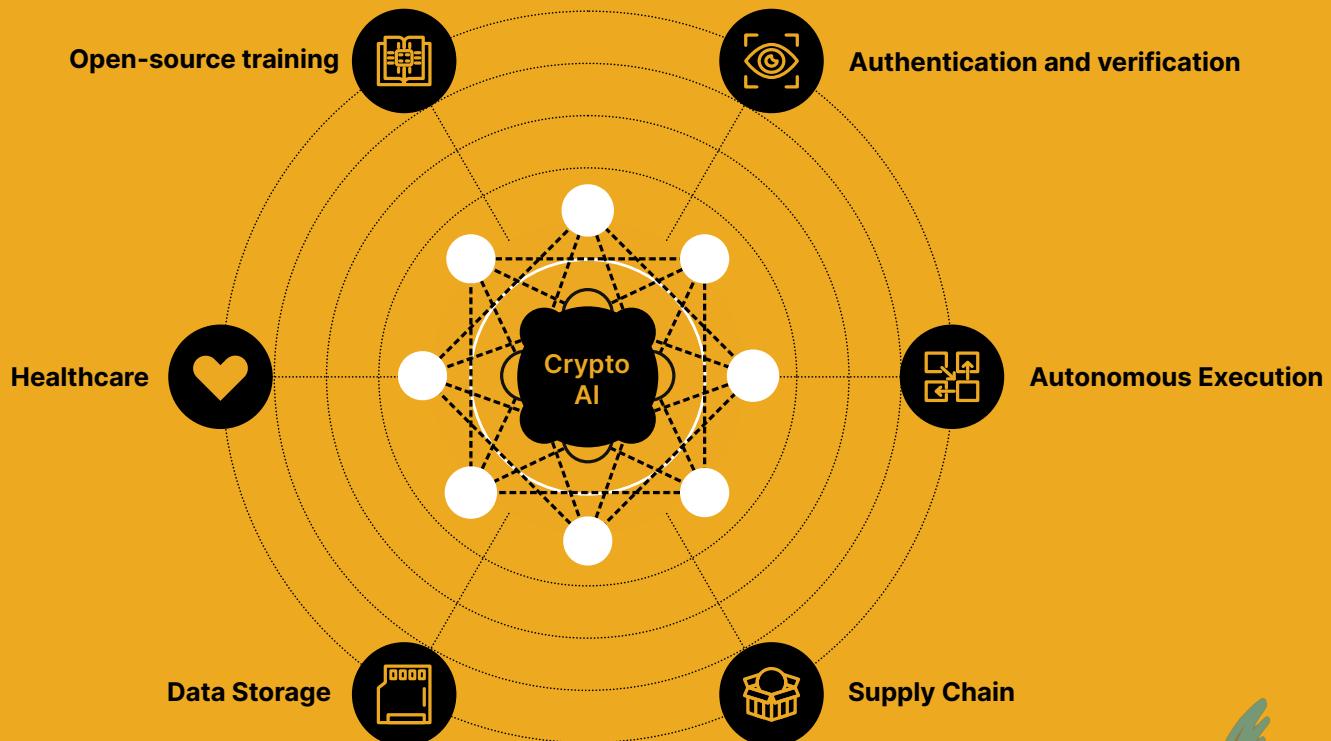
For example, during the 2020 and 2024 presidential elections, the widespread proliferation of fake news significantly influenced voters' decisions, arguably swaying support between candidates. Numerous reports emerged

of entities releasing false stories intended to dissuade or manipulate voters.

Blockchain's unique features—decentralization, transparency, and immutability—enable content fingerprinting and an audit trail to verify information sources. Solutions like Fox Verify⁶¹, built on Polygon, offer a provenance information system, enabling secure content and verifying almost 600,000 publications⁶² in 2024.

However, it is crucial to recognize that a multi-faceted approach, including technological solutions, public awareness, policy measures, and collaboration among various stakeholders, is necessary to effectively combat these risks and ensure the continued trust and security of our information.

Figure 12 – Potential convergence of blockchain and AI



Source: 21Shares

Footnotes

Introduction

1. Bitcoin halving report: <https://www.21shares.com/en-eu/research/bitcoin-halving-report-2024>
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Another nation-state will adopt Bitcoin as a strategic reserve asset

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4. MetaPlanet Holdings: <https://platform.arkhamintelligence.com/explorer/entity/metaplanet-2>
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8. U.S. Government Holdings: <https://platform.arkhamintelligence.com/explorer/entity/usg>

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9. What is the Nakamoto Upgrade? | Stacks Documentation: <https://docs.stacks.co/nakamoto-upgrade/what-is-the-nakamoto-release>
10. sBTC: Design of a Trustless Two-way Peg for Bitcoin: <https://stacks-network.github.io/stacks/sbtc.pdf>
11. At the time of writing, Glassnode recorded nearly \$1 trillion in BTC held by long-term holders, leaving their BTC idle for at least 155 days.
12. GitHub - bip420/bip420_Op_CAT: <https://github.com/bip420/bip420>
13. BitVM: Compute Anything on Bitcoin: <https://bitvm.org/bitvm.pdf>

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14. Danksharding | ethereum.org: <https://ethereum.org/en/roadmap/danksharding/>
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19. Base total value locked: <https://defillama.com/chain/Base>

Solana will continue to eat Ethereum's market share, reaching an all-time high in total value locked

20. Solana's inflows from Ethereum: https://app.artemis.xyz/flows?tab=ecosystemFlows&sourceChains=%2Cethereum&destinationChains=%2Carbitrum%2C-base%2Cmetis%2Cpolygon%2Coptimism%2Csolana%2Cstarknet%2CzkSync&protocols=all%2Cinjective_ibc%2Cpeggy%2Cacross%2Csynapse%2Cworm-hole%2Crainbow_bridge%2Carbitrum%2Cavalanche%2Cbase%2Coptimism%2Cpolygon%2Cstarknet%2CzkSync
21. Solana's DEX traded volume: <https://dune.com/queries/3500326/5886419>
22. Solana Average Transaction Fee vs Median (Non-Vote Transactions): <https://dune.com/queries/4149593/6985114>
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User-friendly layer 1s will drive the growth of the next generation of smart-contract platforms

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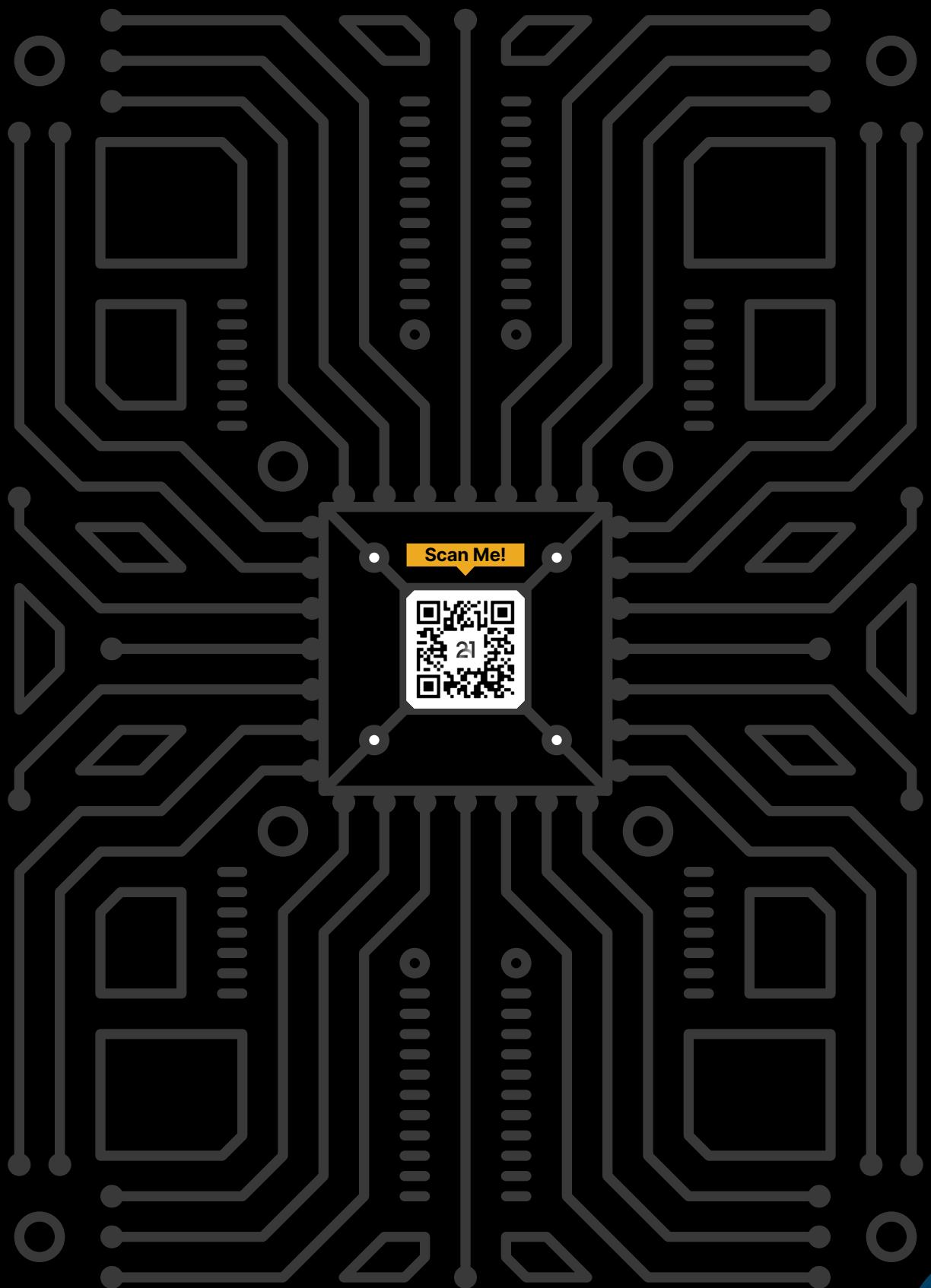
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