CRYPTO'S TURNING POINT

# From speculation to real world adoption

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STEPSTONE

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# Introduction

Blockchain technology—often used interchangeably with "crypto," "digital assets" or "web3"—is the result of decades of advancements in decentralized and distributed ledger systems. Bitcoin, the first blockchain, emerged in 2009 during the Global Financial Crisis. Initially dismissed as a niche experiment, the crypto industry has since evolved into a vast ecosystem of investable assets, where "tokens"—rather than traditional equity or debt—serve as units of ownership and governance in blockchain networks and onchain companies. The proliferation of tokens has given rise to a distinct asset class, attracting investors seeking exposure to blockchain's growth.

Yet despite its longevity, resilience and expanding adoption, crypto remains widely misunderstood, often overshadowed by speculation, volatility and regulatory uncertainty. Much of the skepticism stems from extractive behavior and high-profile fraud perpetrated by bad actors. The collapse of FTX, an offshore centralized exchange that misappropriated billions in customer assets, is a prime example. While this failure was unrelated to blockchain technology itself, it cast a shadow over the industry and fueled widespread misconceptions.

Beyond the headlines and market volatility, blockchain technology's long-term vision remains intact: to build a more decentralized and transparent internet, where ownership and control shift from centralized intermediaries to users. Prominent venture capitalist Chris Dixon at a16z popularized the term "web3," envisioning an internet where users can not only "read" and "write" to the web but "own" and participate in its economic upside.

Those who recognized this structural shift early and allocated capital accordingly have been rewarded, as crypto has been one of the best-performing asset classes since 2009. Bitcoin, the asset in crypto with the longest history, has been the best performer in 9 out of the past 12 years (**Figure 1**).

FIGURE 1: BITCOIN OUTPERFORMANCE

| 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | AVERAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bitcoin 5,866.29% | US Equities 13.69% | Bitcoin 35.10% | Bitcoin 124.07% | Bitcoin 1,622.86% | Treasuries 0.86% | Bitcoin 86.38% | Bitcoin 293.38% | Bitcoin 67.23% | Commodity 16.09% | Bitcoin 156.62% | Bitcoin 122.39% | Bitcoin 681.37% |
| US Equities 32.39% | Real Estate 13.34% | US Equities 1.38% | EM Equities 12.06% | US Equities 21.83% | US Bonds 0.01% | US Equities 31.49% | Gold 24.42% | US Equities 28.71% | Gold (0.13%) | US Equities 26.29% | US Equities 28.07% | US Equities 15.98% |
| EM Equities 3.59% | US Bonds 5.97% | Treasuries 0.84% | US Equities 11.96% | Real Estate 18.73% | Gold (2.14%) | Real Estate 25.92% | US Equities 18.40% | Commodity 27.11% | EM Equities (1.60%) | Gold 13.45% | Gold 27.47% | Real Estate 5.19% |
| Real Estate 3.51% | Treasuries 5.05% | US Bonds 0.55% | Commodity 11.77% | EM Equities 14.90% | US Equities (4.38%) | Gold 18.87% | EM Equities 14.69% | Real Estate 22.06% | Treasuries (12.46%) | EM Equities 12.60% | EM Equities 6.80% | Gold 5.04% |
| US Bonds (2.02%) | EM Equities (1.10%) | Real Estate (0.39%) | Gold 8.63% | Gold 13.68% | Real Estate (6.77%) | EM Equities 13.31% | Treasuries 8.00% | EM Equities 4.42% | US Bonds (13.01%) | Real Estate 9.32% | Commodity 5.38% | EM Equities 4.96% |
| Treasuries (2.75%) | Gold (1.51%) | EM Equities (2.62%) | Real Estate 5.32% | US Bonds 3.54% | EM Equities (8.45%) | US Bonds 8.72% | US Bonds 7.51% | US Bonds (1.54%) | US Equities (18.11%) | US Bonds 5.53% | US Bonds 1.25% | US Bonds 1.60% |
| Commodity (9.52%) | Commodity (17.01%) | Gold (10.46%) | US Bonds 2.65% | Treasuries 2.31% | Commodity (11.25%) | Commodity 7.69% | Commodity (3.12%) | Treasuries (2.32%) | Real Estate (24.42%) | Treasuries 4.05% | Real Estate 1.10% | Treasuries 1.00% |
| Gold (28.26%) | Bitcoin (60.51%) | Commodity (24.66%) | Treasuries 1.04% | Commodity 1.70% | Bitcoin (72.31%) | Treasuries 6.86% | Real Estate (5.42%) | Gold (3.51%) | Bitcoin (65.05%) | Commodity (7.91%) | Treasuries 0.58% | Commodity (0.31%) |

Source: Morningstar, as of December 2024.
Note: Bitcoin is represented by MarketVector Bitcoin PR USD; US Equities are represented by the S&P 500 TR USD; Gold is represented by the S&P GSCI Gold Spot; Emerging Markets is represented by Fidelity Emerging Markets TR; Real Estate is represented by the NASDAQ Global Real Estate TR USD; US Bonds are represented by Bloomberg US Aggregate Bond USD; Treasuries are represented by the Bloomberg Aggregate Bond Treasury TR USD; Commodities are represented by the Bloomberg Commodity TR USD.

# Defining the problem blockchains seek to address

While the internet revolutionized global information exchange, financial transactions were never natively integrated into its early protocols. Technologists refer to this as the "original sin of the internet," arguing that the absence of built-in payment rails forced companies to adopt ad-based business models, distorting incentives, introducing friction across industries and stifling financial innovation.

- **High cross-border fees and slow settlement times:** Traditional remittance services charge an average of 7% per transaction, creating a significant cost burden for individuals sending money across borders. Additionally, settlements often take three or more days, delaying access to funds and increasing reliance on inefficient banking infrastructure.
- **Small-business margin compression:** Credit card processing fees, which range from 2% to 4% per transaction, disproportionately affect small and medium-size businesses that operate on tight margins. Merchants have little choice but to accept these fees to remain competitive, effectively reducing profitability and limiting their ability to reinvest in growth.
- **Technology sector monopolization and platform gatekeeping:** The Google and Apple app store duopoly enforces an industry-standard 30% take-rate on all in-app purchases, significantly reducing developer revenue. Beyond financial costs, these tech companies control access to distribution, deciding which apps and services can operate within their ecosystems, often stifling innovation and competition. In contrast, blockchains offer a neutral, global "app store," where anyone can permissionlessly build and use decentralized applications, with lower fees and take-rates.

Although fintech companies like PayPal have built bridges between the internet and traditional finance, digital commerce still relies on legacy financial infrastructure. Many fintech companies do not yet address these structural inefficiencies: Payments are routed through banks, clearinghouses and payment networks, resulting in longer settlement times, high fees and limited accessibility. Blockchain protocols, on the other hand, embed traditional financial services directly into the internet's fabric.

Blockchains eliminate trusted intermediaries, enabling instant, low-cost and borderless transactions while operating 24/7/365, with global accessibility for anyone with an internet connection. Self-custody extends this principle by allowing individuals to hold and control their assets directly, protecting against exchange collapses and bank failures, as seen with FTX and Silicon Valley Bank in recent years. This is particularly attractive for those who prioritize financial sovereignty and protection from institutional failures.

Also, decentralized platforms free developers from reliance on centralized gatekeepers who can unilaterally change the rules, restrict access and increase platform fees and take-rates. The elimination of platform risk is an important yet underappreciated benefit of blockchains, with far-reaching implications across the economy. A notable example is Zynga's rise and fall on Facebook. The gaming company relied on Facebook's social graph for growth, but when the platform changed its policies—limiting viral game promotions and reducing preferential treatment for third-party developers—Zynga's reach collapsed, leading to its decline. This highlights how centralized platforms can abruptly shift business models, cutting off start-ups' access to users and revenue streams.

Since then, social media companies have faced criticism for deplatforming high-profile figures, censorship, opaque content moderation and privacy violations. While platforms like Meta and X (formerly Twitter) remain dominant today, decentralized social alternatives such as Farcaster, Lens and Bluesky offer greater autonomy, ensuring a more open and predictable development environment. An internet platform that is open and user-focused can make it easier for anyone to build and use apps, with lower fees, integrated payments, and opportunities for both users and developers to benefit from the platform's success.

# The evolution of crypto markets

With blockchain technology's historical challenges and long-term mission defined, where does the industry find itself today? Economist Carlota Perez describes a pattern that nearly all major technological revolutions have followed.[1]

- **Irruption and frenzy phase:** Early speculative capital fuels overinvestment in infrastructure, leading to financial excess and market bubbles.
- **Turning point:** The bubble bursts, forcing the industry to self-correct, shifting focus from speculation to real-world adoption.
- **Synergy and maturity phase:** Policy intervention and institutional adoption drive the technology's widespread integration into the economy.

Crypto's path has been eerily similar. The industry experienced its turning point and has now entered the synergy phase of its development, where regulatory normalization and institutional adoption will drive the next phase of expansion (**Figure 2**).

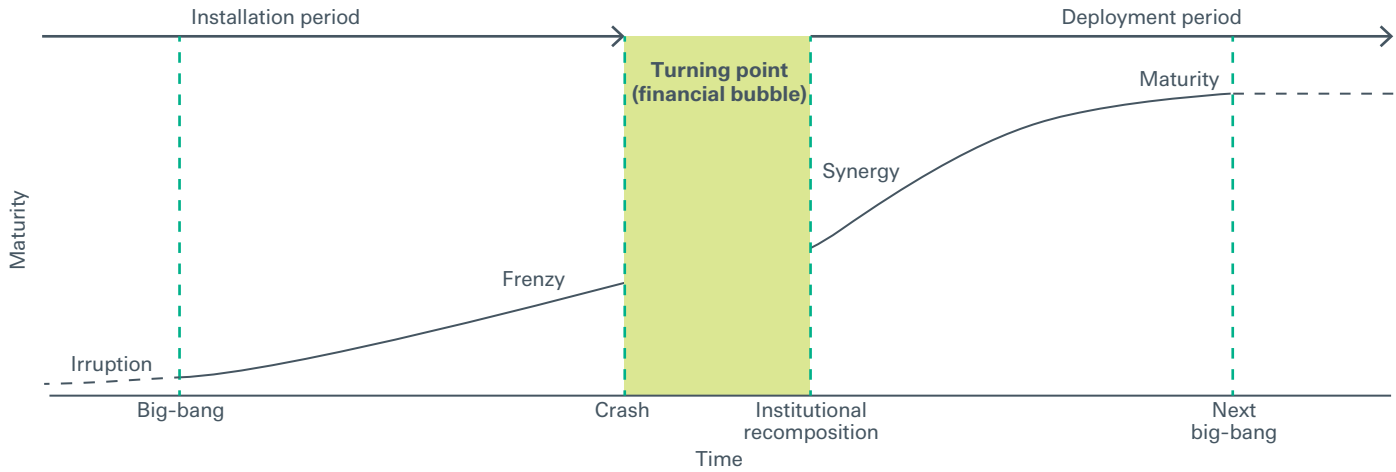
This past US election cycle, the crypto industry mobilized to raise the largest single-issue super PAC in US history. The super PAC played a pivotal role in electing 53 out of 58 pro-crypto congressional candidates, with funds distributed nearly evenly between Democratic and Republican candidates. This bipartisan support suggests that the emerging regulatory environment is likely to be sustained regardless of future administrations' political affiliations.

The new US administration, including leadership at the SEC, CFTC, Treasury and Commerce Departments, is expected to be ardently pro-crypto. Additionally, the appointment of a White House AI and crypto czar reflects a shift toward a strategic regulatory approach.

The recently announced crypto executive order cements key policy shifts. It establishes a framework for traditional financial institutions to take custody of digital assets, protects Americans' right to self-custody, supports US dollar-backed stablecoins and advances market structure legislation. The administration also established a strategic Bitcoin reserve, utilizing Bitcoin seized through previous legal forfeitures, and a US digital asset stockpile for other assets obtained similarly.

Institutional adoption has accelerated alongside regulation. The approval of Bitcoin and Ethereum ETFs last year brought

FIGURE 2: EVOLUTION OF CRYPTO OVER TIME

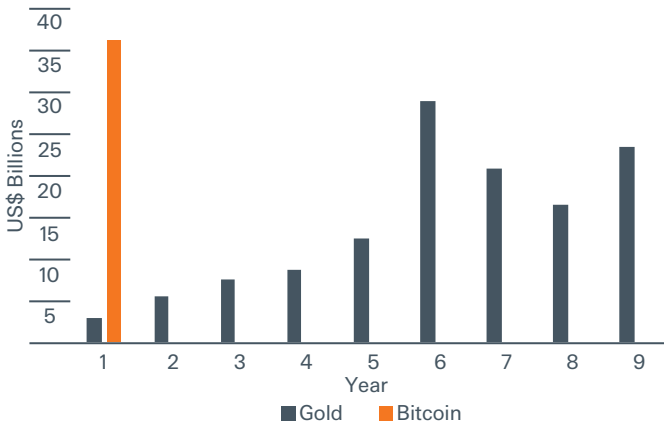



Source: Carlota Perez, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages* (Edward Elgar, 2002).

[1] Carlota Perez, *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages* (Edward Elgar, 2002), 8.

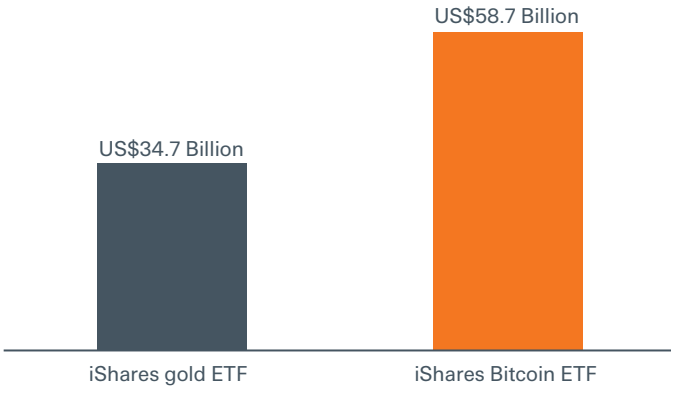
long-awaited legitimacy to the industry and broader access for the investor community, with products launched by BlackRock, Fidelity, VanEck and others far exceeding expectations. In less than a year, BlackRock's iShares Bitcoin ETF surpassed its gold ETF in assets under management, signaling that Bitcoin is increasingly perceived as a store-of-value asset by institutional investors. Net inflows across Bitcoin ETFs have already reached US$36 billion (**Figure 3**), pushing total assets under management to US$120 billion with nearly US$60 billion in the iShares Bitcoin ETF (**Figure 4**).

FIGURE 3: ETF INFLOWS BY YEAR (GOLD VS BITCOIN)




Source: Bitwise from ETF.com, Farside Investors and Bureau of Labor Statistics, as of January 2025.

FIGURE 4: TOTAL ASSETS UNDER MANAGEMENT (GOLD VS BITCOIN)




Source: iShares by BlackRock, as of January 2025.

With regulatory clarity improving and institutional capital flowing in, crypto is no longer defined by high-risk speculation. Rather, the industry is entering a new phase of maturity in which blockchain technology is being integrated into traditional financial markets, infrastructure and applications. Companies such as JPMorgan, Goldman Sachs, PayPal, Visa and Mastercard are actively adopting blockchains, reinforcing their long-term significance in the global economy.

# Transitioning to the application era

Blockchain developers have continued scaling infrastructure, increasing speed, reducing transaction costs and improving user experience. Some describe this as the industry's "dial-up to broadband" moment, where technical breakthroughs are beginning to turn theoretical possibilities into more practical real world applications. Just as broadband unlocked streaming and cloud computing, today's faster, cheaper and more seamless blockchain protocols are setting the stage for global mass adoption.

An important characteristic of open-source blockchain protocols is their inherently composable nature. This composability allows developers to stack, mix and integrate different protocols like modular building blocks, encouraging innovation through reuse and interoperability. Just as small financial gains compound over time to drive exponential growth, interoperable blockchain applications continuously enhance one another, unlocking new possibilities and efficiencies that would be impossible in siloed systems.

Among current use cases, Bitcoin, decentralized finance (DeFi) and US dollar stablecoins have demonstrated clear signs of product-market fit, with strong institutional adoption and consistent user demand. Other areas, such as decentralized physical infrastructure networks (DePIN), prediction markets and the intersection of crypto and AI, remain in their early experimental phase, with significant potential but less widespread adoption today.

## Bitcoin

Although Bitcoin was originally envisioned as a peer-to-peer payment system, its volatility has limited its use for everyday transactions. Instead, it has evolved into a global non-sovereign, censorship-resistant store of value often referred to as "digital gold." Compared with physical gold, Bitcoin offers greater portability, divisibility and ease of transfer, allowing it to be transacted globally without intermediaries. Its fixed, transparent supply of 21 million units also introduces a level of predictability and scarcity that some argue is unmatched by traditional assets.

The successful launch and sustained institutional adoption of Bitcoin ETFs have further solidified Bitcoin's role in investment portfolios, including as a hedge against fiat currency debasement and as an emerging alternative to traditional safe-haven assets.

## DeFi

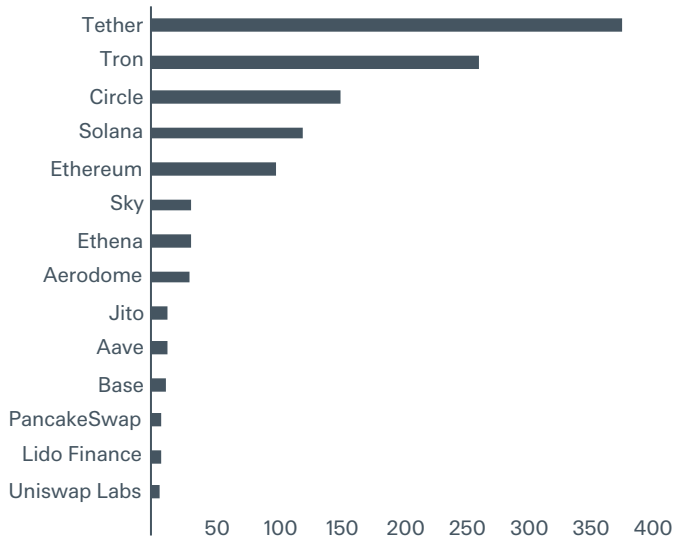
DeFi enables peer-to-peer trading, lending, borrowing and investing without direct reliance on banks or traditional financial intermediaries. By leveraging smart contracts, self-executing contracts with the terms of the agreement directly written into code, DeFi platforms aim to offer transparent, permissionless and efficient financial services for both onchain and tokenized offchain assets. Unlike traditional financial institutions, which often involve custodial control and longer settlement processes, DeFi systems operate continuously—24/7/365—allowing users to access liquidity instantly and, in some cases, with reduced counterparty risk.

> Composability is to software as compounding interest is to finance.
>
> *Chris Dixon,*
> *General Partner, a16z*

DeFi is also revolutionizing capital formation. By enabling global investor participation and providing earlier liquidity for start-ups through token launches, DeFi can offer a more flexible alternative to traditional IPOs and M&A exits. As financial markets evolve, DeFi is increasingly considered a more inclusive, open and programmable complement to the legacy banking system.

Leading DeFi protocols such as Uniswap, Aave, Ethena, Jito and Maker (dba Sky) are generating hundreds of millions in annual revenue, maintaining capital efficiency and resilience, even during periods of market turmoil (**Figure 5**). Additionally, stablecoin issuers such as Tether and Circle, along with dominant smart contract platforms such as Ethereum and Solana, are reporting impressive revenue metrics.

FIGURE 5: MONTHLY REVENUE OF TOP WEB3 PROJECTS (US$ MILLIONS)



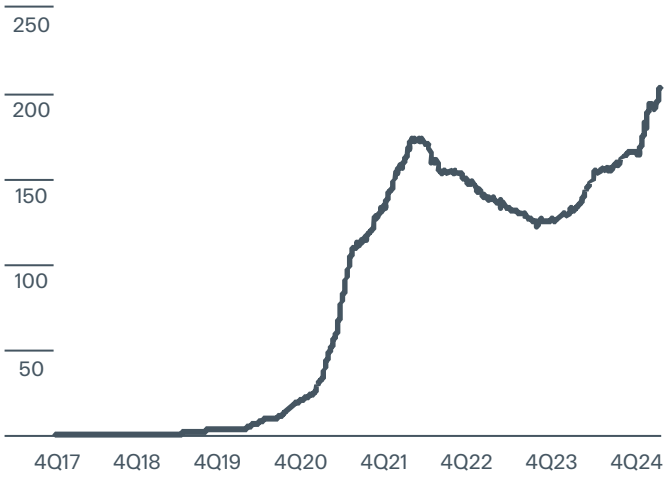

Source: Theory Ventures, as of February 2024.

# US dollar stablecoins and asset tokenization

US dollar stablecoins have gained traction as a medium of exchange within blockchain ecosystems. While Bitcoin remains largely impractical for everyday payments, stablecoins—i.e., onchain, fully collateralized US dollars—have emerged as a widely used alternative for global transactions.

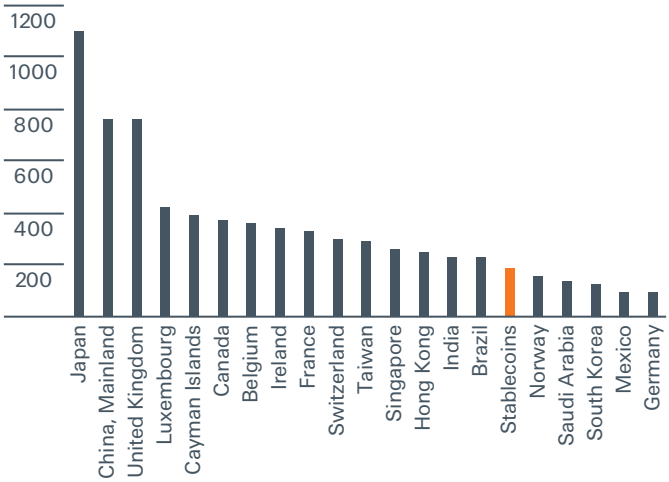
Demand for stablecoins is particularly strong in high-inflation economies and countries with capital controls, where access to a stable store of value and more seamless cross-border payments is highly valued. This trend has driven global demand for US dollars, providing a counterpoint to concerns about de-dollarization. Stablecoins are also increasingly viewed as tools for advancing financial inclusion by offering more accessible financial services to unbanked and underbanked populations. Stablecoin adoption has surged in the past several years, surpassing US$220 billion in market cap (**Figure 6**), more than the amount of US Treasuries held by countries such as Norway, Saudi Arabia, and South Korea (**Figure 7**). In 2024, stablecoin volume hit US$16 trillion, exceeding both Visa and Mastercard.[2] Stripe's acquisition of Bridge, a stablecoin payment platform, marked the largest industry acquisition to date, highlighting the growing interest in blockchain-based payment infrastructure.

FIGURE 6: STABLECOIN MARKET CAP (US$ BILLIONS)




Source: The Block, Decrypt.co, as of January 2025.

FIGURE 7: US TREASURIES HELD BY COUNTRY (US$ BILLIONS)




Source: US Treasury, as of January 2025.

The transition of US dollars—and eventually all forms of value—from offchain to onchain mirrors the shift of information from offline to online. Just as the internet revolutionized access to information and spurred the creation of new products and services, the widespread adoption of US dollar stablecoins will likely fuel a wave of innovative financial applications and unlock new efficiencies and opportunities in digital commerce.

Stablecoins' growth has fueled interest in the tokenization of all traditional financial assets, with banks and asset managers exploring tokenized US Treasuries, equities and commodities to improve market efficiency and accessibility. As blockchain-based financial infrastructure matures, tokenization is increasingly seen as the next major evolution in capital markets. Major financial institutions are already taking action: BlackRock launched its BUIDL product, Apollo tokenized its credit fund and Franklin Templeton has announced its OnChain US Government Money Fund.

[2] ARK Invest, "Big Ideas 2025" (ARK Invest, 2025), 49.

> Tokenization has the potential to reshape global finance by increasing transparency, reducing costs and expanding market access. We are watching this space closely.
>
> *Brian Moynihan,*
> *CEO, Bank of America*

## DePIN

DePIN projects leverage blockchain and token incentives to decentralize the development, funding and operation of physical infrastructure, reducing costs and increasing efficiency. Instead of relying on centralized corporations to deploy and maintain networks, DePIN models enable individuals and communities to participate in infrastructure expansion while earning rewards.

One of the most prominent examples is Helium, a decentralized wireless network that incentivizes individuals to install and operate IoT and 5G hot spots. Participants earn tokens based on the coverage and quality of their network contributions, creating a self-sustaining ecosystem where infrastructure scales organically based on demand.

Beyond telecom, the DePIN model is also being applied to cloud computing, energy grids, mapping networks and decentralized storage solutions, offering cost savings, greater resilience and broader accessibility compared with centralized alternatives. However, widespread adoption has not yet taken place, as businesses are still struggling to identify markets with large enough end-user demand.

## Prediction markets

Prediction markets use blockchain technology to create decentralized, trustless platforms where users can trade on the outcomes of future events. By removing intermediaries and centralized control, these markets enhance transparency, price discovery and fairness.

A leading example is Polymarket, which allows users to bet on real-world events such as elections, economic indicators and sports outcomes. Prices fluctuate based on market sentiment, reflecting the probability of each outcome. Polymarket's accuracy, driven by its "skin in the game" dynamic, gained widespread recognition during the recent US election cycle. Their election forecasts outperformed some traditional polling methods, at times predicting the outcomes of certain races and election-related news days before traditional media outlets.

Beyond speculation, prediction markets have broader implications for risk management, decision-making and financial forecasting. Governments, businesses and researchers are beginning to leverage these markets for policy analysis, supply chain forecasting and financial risk assessment. This showcases their potential as data-driven decision-making tools.

## Crypto x AI

The intersection of crypto and AI is unlocking new opportunities by decentralizing AI model training, governance and data integrity. Blockchain's immutability, tokenization and decentralized governance help address key challenges in AI development. The two technologies complement each other—AI creates abundance, while crypto enforces scarcity. By integrating, they pave the way for powerful AI systems to be governed and owned by a broad, user-driven community instead of a few dominant tech companies.

- **Provenance and data integrity:** Blockchain protocols ensure verifiable, tamper-proof datasets for AI training, reducing bias and improving model reliability.
- **Decentralized data collection:** Individuals and organizations can securely share and monetize data without compromising privacy or giving up control to large tech companies.
- **Decentralized AI inference and model deployment:** AI models can run on distributed networks, improving accessibility, reducing failure points and fostering competition.
- **Financial rails for autonomous agents:** AI agents can now manage their own crypto wallets, allowing them to store funds, make payments and handle digital transactions.

As the industry transitions to real-world adoption, a few key challenges remain. The focus must shift beyond short-term speculation—often driven by hype cycles and unsustainable token models—toward building businesses with real utility, fundamentals and long-term value. User experience remains a barrier to mass adoption, but innovations such as smart contract wallets and account abstraction are making blockchain-based applications more accessible. Further, many blockchains still operate in isolation, making it difficult for users and assets to move freely between networks. New technologies, however, are improving interoperability, enabling blockchains to work together more seamlessly and laying the foundation for more sustainable growth.

# Conclusion

Venture capital thrives on bold, transformational ideas that tackle complex problems—not incremental innovation—and crypto is taking on some of the most entrenched industries, long dominated by powerful incumbents resistant to disruption. As trust in dominant tech companies, financial institutions and governments continues to erode, decentralized blockchain networks are emerging as a credible alternative to traditional systems.

The industry has reached its "turning point," shifting from speculation to the productive phase of its evolution, marked by real-world adoption and meaningful economic value creation. Bitcoin has cemented its role as digital gold, DeFi is transforming capital markets and US dollar stablecoins are modernizing global payment infrastructure. At the same time, emerging applications—ranging from DePIN and prediction markets to innovations at the intersection of crypto and AI—are expanding blockchain's utility and laying the groundwork for the next era of financial and technological innovation.

Despite historical challenges—including regulatory hostility, market volatility and high-profile fraud—the industry has matured into a global, multi-trillion-dollar asset class. With more pro-innovation regulation on the horizon and institutional adoption accelerating, crypto is becoming foundational to global value transfer—much as the internet became essential to global information exchange.

History shows that outsized returns often are rewarded to those who are both contrarian and correct—those who identify transformative opportunities before they become mainstream. While crypto remains a contrarian bet for many, clear signs of product-market fit are emerging, and the technology is rapidly integrating into traditional businesses. This confluence creates a compelling opportunity with asymmetric upside for investors.

Yet many institutional portfolios remain underexposed to one of the best-performing asset classes of the past decade—at a time when the industry's outlook is more positive than ever.[3] Investors who recognize crypto's long-term potential, remain patient through market cycles and partner with experienced specialists will be well positioned to capitalize on what may be one of the most significant platform shifts of our time.

[3] EY, "Staying the Course: Institutional Investor Sentiment Toward Blockchain and Digital Assets" (EY, 2023).

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